Do Tax-Deferred Exchanges Impact Purchase Price? Evidence from the Phoenix Apartment Market

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Evidence from the Phoenix Apartment Market

Abstract

Many authors have commented on the compliance risk associated with tax-deferred exchanges. However, no published studies explicitly address whether the risks associated with the exchange process impacts the price at which exchanged assets trade. Using a unique data set that separates buy and sell side transactions for non-direct exchanges, this study examines the price impact of tax-deferred exchanges on apartment transactions in the Phoenix, Arizona market. Consistent with the price pressure hypothesis originally developed by Scholes (1972) and Kraus and Stoll (1972), the data show that exchange participants pay an economically significant premium to acquire replacement assets. A conventional hedonic price index is generated to investigate the rational bounds of the exchange premium. While the impact of an exchange is large, the premium is within the rational bounds.

A tax-deferred exchange, frequently referred to as a Section 1031 exchange, can enhance the investment value of real property transactions by deferring the tax liability associated with the disposal of appreciated real estate. The original IRS code on tax-deferred exchanges of real property was issued in 1921. However, before Starker vs. the United States in 1979, Section 1031 exchanges had to be executed simultaneously. The simultaneity requirement created a major hindrance to the execution of exchanges due to the difficulty of synchronizing the close of escrow on two or more complex transactions. Hence, few transactions were involved in the tax-deferment offered by a Section 1031 exchange (Goodman [1980]).

In the Starker case, the court held that non-simultaneous exchanges qualify for tax-deferred status. Unfortunately, the taxing authority originally gave little administrative guidance on the proper execution of non-simultaneous exchanges. While case law developed in the 1980s tended toward increasing leniency in the acceptable time period during which the two "legs" of the exchange transaction could be completed, the continued uncertainty surrounding the allowable parameters of the non-simultaneous exchange discouraged widespread use (Rier [1985]).

The Tax Reform Act of 1986 and the IRS regulations issued in May 1991 reduced the uncertainty over the parameters of a qualifying exchange by clearly delineating the maximum time period over which both legs of the exchange could be completed. As a result of the clear specification of the legal requirements, usage of the 1031 exchange vehicle increased dramatically in the early 1990s (see Frank [1995]).

The requirements of a qualifying exchange are now well defined. Specifically, once an investor relinquishes title to a property, he must identify a replacement property within a 45-day period. The replacement property transaction must then be closed within a further 135 days. During the 45-day identification period, the participant who relinquished a property in anticipation of finding a replacement property can identify up to three candidate assets.[1] The time intervals constitute absolute deadlines even when the 45th or 180th day falls on a weekend or legal holiday (see Frank [1995]). Substantial compliance is not adequate to preserve the tax-deferred status of the exchange.

Identification of potential replacement candidates within the 45-day time limit is frequently a binding constraint (Cuff [1998]). Failure to properly identify (and document) the potential replacement property within the specified time frame nullifies the tax-deferred status of the sale. As noted by Hudson (1998), Lynch (1998), and Raitz and Raitz (2000), the time pressure associated with the identification period limits the due diligence efforts of the participant seeking the replacement asset. In addition to the uncertainties of identifying an acceptable replacement property within the time limit, a plethora of obstacles – such as permits, appraisals, loan approvals, inspections, licenses, and the competence and willingness of the other party – are beyond the control of the replacement buyer and may impact his ability to close on the replacement asset within the 180 day limitation (Sommers [1988]).

Many authors [e.g., Rier (1985), Sommers (1988), Groebe (1989), Levine (1991), Frank (1995), Freedman (1995), Cuff (1997, 1998a, 1998b, 1998c), Bannoff, Lipton, and Kanter (1998), Raitz and Raitz (2000), and Killip and DeLeo (2000)] point to the compliance risk associated with attempting an exchange, especially a non-simultaneous exchange. In particular, if an investor relinquishes title to a property with substantial appreciation in anticipation of executing a tax-deferred exchange, the exchange participant may have compromised his bargaining position with other parties, including the sellers of potential replacement properties (Sommers [1988]). While some of these obstacles can be avoided by conscientious identification of the replacement property before disposal of the relinquished property, practitioners report that a substantial proportion of sellers seeking to effect an exchange have not identified a replacement asset at the close of escrow on the relinquished property (see *The Practical Accountant* [1997]).

Whereas the literature on tax-deferred exchanges is replete with articles that warn of the compliance risk associated with exchange transactions, we are aware of no studies that explicitly examine whether compliance risks impact the price paid for the replacement property.[2] If market participants are engaged solely in the

economic decisions associated with the disposal and acquisition of the exchanged assets, then transactions involving exchange participants will be priced the same as non-exchange transactions. If, however, Section 1031 fundamentally alters the parameters surrounding the decision to enter into a transaction, then the price paid for properties involved in an exchange transaction may be impacted. This article advances the literature by assessing whether exchange transactions create price differentials in the apartment market in a test city, namely Phoenix.

The paper is organized as follows: Section 2 develops the theoretical foundation and model used to examine potential price differentials associated with exchange transactions, Section 3 discusses the data used in this investigation, Section 4 presents the empirical results, and Section 5 summarizes findings and conclusions.

Theory and Model

Theoretical Foundation

Suppose an investor with a capital gains tax rate of $?_c$ has relinquished a property with taxable capital gains of $?$ dollars in anticipation of effecting an exchange. Without the exchange, the investor would incur an immediate tax liability of:

$$\text{Tax} = ??_c \tag{1}$$

If the investor is successful in effecting the ideal exchange, the full amount of the tax liability will be deferred during the holding period of the acquired property. The benefit of the exchange process is that the present value of the tax liability is reduced since payment of the tax is delayed. For an investor with an expected holding period for the acquired property of n years and a cost of capital of r, the present value of the deferred tax liability is:

$$\text{Present Value of Deferred Tax} = \frac{??_c}{(1 ? r)^n} \tag{2}$$

Hence, the value of utilizing the tax-deferment provisions of a Section 1031 exchange for an investor with an expected holding period of n years is:

$$\text{Exchange Benefit} = [??_c] - \frac{??_c}{(1 ? r)^n} \tag{3}$$

In the absence of regulatory constraints, an investor seeking to acquire real property would be willing to pay at most an amount equal to the present value of the asset's cash flows discounted at the market required rate of return k, formally:

$$\text{Price} = \sum \frac{CF_i}{(1+k)^i} \tag{4}$$

Scholes (1972) and Kraus and Stoll (1972) suggest that the price of an asset can be affected by "temporary" changes in demand. Under their hypothesis, developed in the context of block trades and referred to as the Price Pressure Hypothesis (PPH), the imposition of a temporary increase in demand will result in trades above the equilibrium price described in Equation (4). Numerous authors document evidence of price and demand effects consistent with the PPH.[3] In particular, Harris and Gruel (1986) conclude that price increases associated with temporary demand changes are necessary in order to attract "passive suppliers of liquidity." Given the documented liquidity constraints or thin markets associated with real property (Moore [1987], Kluger and Miller [1990], and Hasbrouck [1991]) the urgency imposed on exchange participants by the regulatory time constraints may result in price differentials consistent with the PPH.

Assume an investor has relinquished an appreciated asset in anticipation of completing a Section 1031 exchange. As the regulatory deadline for identification of replacement properties approaches, the would-be exchange participant must identify a replacement property or recognize the full amount of the gain from the sale of the relinquished asset. Faced with thin markets, the investor may be pressured to pay a premium for the replacement asset. Specifically, the exchange participant seeking a replacement property could pay a premium up to the value of the exchange benefit in Equation (3) and still be as well off as other market participants not facing the exchange-induced time constraints. That is, a rational would-be exchange participant who is confronted with a choice between recognition of a gain and deferment through an exchange could pay up to:

$$\text{Max Price} = \sum \frac{CF_i}{(1+k)^i} + \left[(??_c) - \frac{??_c}{(1+r)^n}\right] \tag{5}$$

Stated in percentage of the non-exchange market price in Equation (4), the exchange participant could pay a maximum rational premium of:

$$\text{Max Premium} = \frac{??_c - \frac{??_c}{(1+r)^n}}{\sum \frac{CF_t}{(1+r)^t}} \tag{6}$$

If the exchange participant anticipates an infinite deferral of the tax liability (e.g., through a series of deferrals and / or strategic estate planning), the upper bound on the magnitude of the rational premium is:

$$\text{Upper Bound} = \frac{??_c}{\sum \frac{CF_t}{(1+r)^t}} \tag{7}$$

As asserted above, given binding constraints associated with illiquidity in thin markets, a rational exchange participant may be willing to pay a premium for a replacement asset. To the extent that price pressure results in the acquisition of a replacement property for less than the maximum premium defined in Equation (6), the exchange participant will be better off even though the price paid is greater than the equilibrium price in Equation (4). Hence, the exchange participant may still be better off even though the urgency imposed by the regulatory time constraints of an exchange result in disadvantageous price pressure premiums.

Model

In order to determine if regulatory constraints result in price premiums, we estimate a single equation, reduced form price function, to explain the price of apartment properties, specifically:

$$LnPRICESF = \beta_0 + \beta_1 LnUNITS + \beta_2 COVERPARK + \beta_3 POOL + \beta_4 CLUB + \beta_5 LAUNDRY + \beta_6 TENNIS + \sum_{i=2}^{5} \beta_i CONDITION_i + \sum_{i=2}^{3} \beta_i EXCHANGE_i \tag{8}$$

Where,

LnPRICESF	=	the natural log of the sale price per square foot of the property;
LnUNITS	=	the natural log of the number of units in the complex;
COVERPARK	=	the number of covered parking spaces;
POOL	=	a binary variable for the presence of a swimming pool (=1 if present);
CLUB	=	a binary variable for the presence of a clubhouse (= 1 if present);
LAUNDRY	=	a binary variable for the presence of a laundry facility (= 1 if present);
TENNIS	=	a binary variable for the presence of a tennis facility (= 1 if present);
CONDITION	=	condition of the property, based on inspection; the inspectors rate the condition of each property as 1) excellent, 2) good, 3) average, 4) fair, and 5) poor. Each category is included in the structural model as a binary variable, except average, which is suppressed;
EXCHANGE	=	exchange status of the transaction; the possibilities include a buyer exchange (the purchaser is acquiring the asset as a replacement property in a qualified Section 1031 exchange), a seller exchange (the seller is relinquishing the property as part of a Section 1031 exchange), and non-exchange (neither the purchaser nor seller is involved in a qualified exchange. Each category is included in the structural model as a binary variable, except non-exchange, which is suppressed.

LnUNITS is expected to be negatively associated with price per square foot due to economies of scale in the construction process. In the Phoenix market, the extreme summer heat results in a high preference for covered

parking stalls; therefore, covered parking is likely to positively impact rents, and thus, value. The expected impact of valued amenities, such as those represented by the variables POOL, CLUB, LAUNDRY, and TENNIS, is expected to be positive. Each property in the sample was inspected and rated as to overall condition. The inspection process, performed by Comps InfoSystems, Inc., resulted in each property being assigned to one of five condition categories – excellent, good, average, fair, or poor. In our operational model, the suppressed category is "average". The parameters estimated for EXCELLENT and GOOD are expected to be positive while the parameters for FAIR and POOR are expected to be negative. Further, if the assessments are consistent, we would expect the magnitude of the coefficients to rank order from EXCELLENT to POOR.

The true variables of interest are the exchange variables, BUYER EXCHANGE and SELLER EXCHANGE. The PPH suggests that the BUYER EXCHANGE variable will have a positive parameter. Indeed, if the parameter on the buyer exchange variable is significant and positive, we will conclude that the regulation is impacting the sales price of the replacement property. If the null hypothesis of no impact is rejected (i.e., if the estimated coefficient on BUYER EXCHANGE is significantly different from zero), assessment of the economic significance and rationality of the BUYER EXCHANGE parameter is pertinent.

Strict interpretation of the PPH suggests that the impact of the SELLER EXCHANGE variable would be negative. However, it is unlikely that a seller will accept a below market price in order to rush into the risks associated with finding and closing on the replacement property. Given that no incentive to rush into the sell of the relinquished property exists (indeed, the incentive is to delay closing), the seller of a relinquished property experiences no regulation-induced urgency.[4] Hence, our expectation is that the SELLER EXCHANGE variable will be positive, if any impact is discernable, since the seller has the ability to be opportunistic in his approach to the disposal of the relinquished asset.

In any empirical analysis without observable determinants, the possibility of omitted variable bias exists. For omitted variables to distort our findings on the price impact of exchanges, the omitted variable would have to have explanatory power, be correlated with the exchange variable, and not be explained by the included set of independent variables in Equation (8). Viewing our inference structure as a standard omitted variable test for the impact of an exchange transaction (e.g., Holmes and Horvitz [1994], Hunter and Walker [1996], and Phillips-Patrick and Rossi [1996]), the potential impact of omitted hedonic variables is muted. While omission of a hedonic variable such as proximity to shopping or employment centers may impact other hedonic variables such as parking, it is 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 the exchange variables. Further,

given that most macro-economic variables such as unemployment and interest rates were relatively stable during our 1995 - 1997 sample period, significant impact from macro-economic variables seems unlikely.

Data

The data used in this study consist of 692 apartment transactions from the Phoenix metropolitan area that cover the time period of September 1995 through December 1997.[5] The providers of the data inspect each property and confirm the particulars of the transaction with the relevant parties, including buyer, seller, and broker. During the inspection process, the inspector provides a subjective estimate pertaining to the condition of the property. In addition, the inspector documents the physical characteristics of the property during the on-site inspection. Because of the level of detail pertaining to the transactions, particularly the information relating to the exchange status, the data set provides a unique opportunity to examine the impact of exchange status on sales price. Table 1 provides descriptive statistics of the data set.

[Table 1]

The range in sales price and building area illustrate a large variation in the value and size of the properties. As was to be expected in the Phoenix area, over 50 percent of the parking spaces are covered. Approximately 57 percent of the properties have a swimming pool, and approximately 15 percent have a clubhouse facility onsite. A majority of the properties (78 percent) are considered in average condition, while few are considered excellent or poor. The exchange variables, which are the focus of this study, include buyers exchange, sellers exchange, and non-exchange. In this data set, transactions that are part of a direct exchange are excluded. Additionally, transactions that are part of both a sellers exchange and buyers exchange are also excluded.

Empirical Results

The objective of our model is to determine if price differentials occur in transactions involved in a tax-deferred exchange. Table 2 shows the estimation results of equation (8).

[Table 2]

Of the non-exchange explanatory variables, all but LAUNDRY and TENNIS exhibit the expected sign and are significant at the 0.05 level. Project characteristic variables such as LnUNITS, COVERPARK, POOL, and CLUB are positive and significant in explaining the price per square foot of apartment properties; however,

LAUNDRY and TENNIS don't contribute to the model. With regard to the condition variables, the magnitude of the parameters conforms to the intended classification system. Both EXCELLENT and GOOD were intended to indicate property conditions above the average, with EXCELLENT implying better property condition than GOOD. Table 2 shows that the parameters for both EXCELLENT and GOOD are positive, and the magnitude of the parameter on EXCELLENT is, as predicted, greater than the magnitude of the parameter on GOOD. The parameters for property condition assessments below average, specifically FAIR and POOR, continue the ordinal ranking with POOR being more negative than FAIR. The specified model explains 32% of the variation in the sales price per square foot of Phoenix apartment properties.

The parameter on SELLER EXCHANGE is insignificant. As noted above, the economic rationale for a price impact in the sell of the relinquished property is not as strong as for the purchase of the replacement property. Hence, the insignificant coefficient on the SELLER EXCHANGE variable is not surprising.

As conjectured (but never tested) by many articles on replacement property acquisition, the parameter on BUYERS EXCHANGE is positive and significant at the 0.05 level constituting statistical evidence that buyers pay a premium for replacement assets in a tax deferred exchange. The positive impact on the purchase price of the replacement asset is consistent with the PPH as it pertains to the time constraints and thin markets associated with tax-deferred exchanges in real estate markets.

Given the statistical significance of the BUYER EXCHANGE variable, interpretation of economic significance and rationality is pertinent. The estimated coefficient on BUYER EXCHANGE is .094 indicating that, *ceteris paribus*, an exchange participant acquiring a replacement asset pays a premium of approximately 9 ½ percent. A purchase price premium of this magnitude is economically meaningful for most observers. Consistent with the PPH, the data support the hypothesis that a buyer acquiring a property to complete a non-simultaneous Section 1031 exchange pays a significant premium in order to complete the transaction within the required time frame.

The recent history of the Phoenix market is pertinent to the interpretation of the rationality of the exchange impact. Real estate prices in Phoenix experienced large declines in the late 1980s and early 1990s. Our data, which come from the 1995 to 1997 period, represent transactions that occurred after a strong recovery in prices. Hence, our sample may represent exchanges with larger than average capital gains. Since the benefits of an exchange increase in proportion to the magnitude of the gains to be deferred, the magnitude of the

coefficient on BUYER EXCHANGE may be greater than in other settings.

The economic rationality of the estimated coefficient for BUYERS EXCHANGE can be formally assessed using Equation (7), the rational upper bound on the magnitude of the premium for the purchase of the replacement asset. Since the upper bound assumes infinite deferment, the rational limits of the exchange premium are an increasing function of the amount of the gain to be deferred and the tax rate on capital gains. However, the tax rate on capital gains during our sample period is constant at 28% (U.S. Master Tax Guide [1999]).[6] Given that the tax rate is constant, the rational upper bound is reduced to a function of the amount of the capital gain to be deferred and the non-exchange value of the replacement property.

Unfortunately, the amount of the capital gain to be deferred in the exchange transactions, $?$, is not available. To gain insight into the potential magnitude of the capital gains to be deferred, we estimate a conventional hedonic price index for the Phoenix apartment market. Following Clapp, Giaccotto, and Tirtirglu (1991) as well as Knight, Dombrow, and Sirmans (1995), we include a vector of time dummy variables in the hedonic model as follows:

$$LnPRICESF = ?_0 + ?_1 LnUNITS + ?_2 COVERPARK + ?_3 POOL + ?_4 CLUB + ?_5 LAUNDRY + ?_6 TENNIS + \sum_{i=2}^{5} ?_i CONDITION_i + \sum_{i=2}^{3} ?_i EXCHANGE_i + \sum_{i=1991}^{1997} ?_i TIME_i \quad (9)$$

The parameters on the time variables capture the intertemporal pure price change. The index is constructed be taking the antilog of the parameters and normalizing to the base period. Figure 1 illustrates the price index for the Phoenix apartment market from 1990 through 1997.[7]

[Figure 1]

The index shows the market in decline from 1990 through 1992. However, after the trough, the market experiences a strong recovery through the end of the study period. In fact, the market experiences a 61 percent increase in prices between 1992 and 1997. Given that the value of an exchange increases with the amount of the capital gain to be deferred, we expect the average appreciation for relinquished properties sold in anticipation of an exchange to be greater than the appreciation for properties generally. Nonetheless, we use average appreciation rates to conservatively gauge the reasonableness of the estimated parameter on BUYER EXCHANGE.

Given that the capital gains tax rate is constant over our sample, estimation of the upper bound requires two inputs: 1) the market price for a non-exchange transaction, and 2) the amount of the capital gain to be deferred in an exchange transaction. While the required inputs are not directly observable, each can be inferred. The non-exchange value of the representative property can be estimated using our estimated pricing model given in Table 2. Interpreting the equation from Table 2 at the mean of all hedonic explanatory variables (i.e., the non-exchange variables) yields as estimated price per square foot of $31.87 for non-exchange transactions. Assuming an ideal exchange, the relinquished property that had full benefit of the 61% price appreciation would have $12.08 per square foot in deferrable capital gains.[8,9] Thus, for the representative transaction in an ideal exchange, the rational upper bound for the exchange premium from Equation (7) is 10.61% [i.e., the capital gain to be deferred times the tax rate on capital gains divided by the purchase price of the replacement asset, or (12.08 x .28)/ 31.87], above our estimated coefficient of approximately 9 ½ percent.

Whereas we are surprised by the magnitude of the exchange impact, the coefficient falls within the rational bound given the large price increases experienced in the test market. Further, as noted above, since the value of an exchange increases as the amount of capital gains to be deferred increases, we expect that exchanged assets will have greater than average capital gains. Hence, the average appreciation in the Phoenix market may understate the average capital gain deferred in exchange transactions and, thus, cause our estimate of the upper bound to be conservatively stated.

The model reported here is the result of economic analysis of the determinants of price. However, we conducted significant sensitivity analysis on the form of the model, the structure of the response variable, and the set of explanatory variables. The magnitude of the coefficient on BUYER EXCHANGE and the qualitative results are robust to all the variations investigated. In all cases, the coefficient on BUYER EXCHANGE is positive and highly significant and predicts an exchange premium between 8% and 10%.

Summary and Conclusion

Although codified in the 1920s, the tax deferment provisions of a Section 1031 exchange experienced very little use in real property transactions for a number of decades due to uncertainty surrounding the parameters of a qualified exchange. However, much of the uncertainty was resolved in 1991 when the IRS issued final guidelines delineating the precise time constraints for the purchase of a replacement asset in a non-simultaneous exchange. Under these guidelines, a non-simultaneous exchange qualifies for tax differed status under Section 1031 if: 1) the replacement property is identified within 45 days of the close of the relinquished

property, and 2) the purchase of the replacement property is completed within 180 days of the close of the relinquished asset. The increased certainty of the criteria for a qualifying exchange lead to widespread use of tax deferred exchanges in the 1990s.

While the clear specification of the time requirements for an exchange eliminated uncertainty of the legal requirements for tax deferment, the relative shortness of the allowable time interval between the sale of the relinquished property and the completion of the exchange creates significant compliance risk. Many authors warn of the compliance perils associated with attempting non-simultaneous exchanges [e.g., Rier (1985), Sommers (1988), Groebe (1989), Levine (1991), Frank (1995), Freedman (1995), Cuff (1997, 1998a, 1998b, 1998c), Bannoff, Lipton, and Kanter (1998), Raitz and Raitz (2000), and Killip and DeLeo (2000)]. Specifically, the thin markets often associated with real property may be exacerbated by the severe time constraints associated with the exchange process to produce disadvantageous price premiums.

Economic intuition affirms that the combination of rigid time constraints, impaired negotiating position, and thin real estate markets could have an impact on purchase price for assets involved in an exchange. However, while many authors discuss the risks associated with the exchange process, no effort has been devoted to discerning empirically whether compliance risk impacts the purchase price of exchanged assets.

Using a unique data set, we estimate a hedonic pricing model explaining sales price for 692 apartment transactions in the Phoenix market. To the hedonic model, we add binary variables indicating whether the transaction is part of an exchange. The results are convincing. While sales price of relinquished assets is not significantly impacted, the data clearly show that exchange participants pay a premium for replacement assets consistent with the price pressure hypothesis developed by Scholes (1972) and Kraus and Stoll (1972). The estimated coefficient on the BUYERS EXCHANGE variable of 0.094 (p-value of 0.013), suggest that exchange participants pay a premium to acquire replacement assets. Whereas the impact is relatively large, the empirically estimated premium falls within the rational pricing bounds. Further, given the significant price appreciation in our test market, the exchange impact in our sample may be greater than in other MSAs or other time periods.

The findings show that the regulatory constraints imposed by the requirements of a Section 1031 exchange materially alter the distribution of resources. The primary limitation of our results is the scope of the investigation. We examined one property type (apartments) in one market (Phoenix) over one time period

(1995-1997). Given the magnitude of the impact of exchanges on sales price in this sample, a clear need exists to extend the research initiated here to other property categories, regions, and time periods.

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Table 1
Descriptive Statistics of the Transaction Data
Apartment Properties, Phoenix 1995-1997

Variable	Mean	St. Dev.	Minimum	Maximum
Sales Price	$2,723,000	$4,738,000	$150,000	$33,600,000
Number of Units	79.09	107.80	2	762
Building Area (Sq. Ft.)	61,528	85,296	1,998	553,020
Covered Parking Spaces	59.31	108.36	0	841
Total Parking Spaces	117.24	167.91	2	1,200

Frequency of Dichotomous Variables

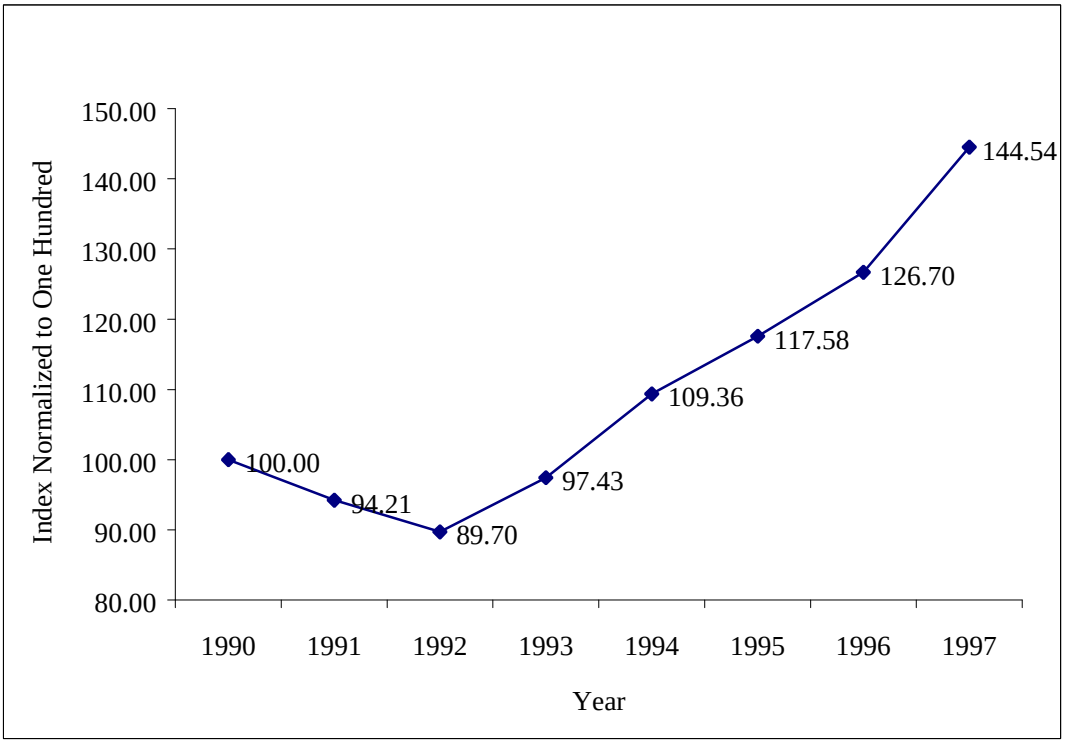
Variable	Mean	Observations
Total Observations		692
Project Amenities		
Swimming Pool(s)	.5679	393
Clubhouse	.1503	104
Laundry	.3309	229
Tennis Court(s)	.0895	62
Condition		
Excellent	.0188	13
Good	.0664	46
Average	.7789	539
Fair	.1301	90
Poor	.0029	2
Exchange Variables		
Non-exchange	.8829	611
Buyers Exchange	.1040	72
Sellers Exchange	.0131	9

Table 2
Regression Results

Explanatory Variables	Parameter	t-Statistics
Intercept	3.762	(84.4)
Natural Log of Units	0.108*	(6.9)
Covered Parking Spaces	0.0011*	(6.6)
Swimming Pool	0.131*	(4.4)
Clubhouse	0.174*	(4.1)
Laundry	0.0018	(0.05)
Tennis Court	0.050	(1.0)
Excellent Condition	0.462*	(5.2)
Good Condition	0.310*	(6.3)
Fair Condition	-0.152*	(4.2)
Poor Condition	-0.515*	(2.4)
Buyers Exchange	0.094*	(2.5)
Sellers Exchange	0.116	(1.1)
Adjusted R-Square	0.318	

Dependent variable is natural log of sales price per square foot. The omitted dummy variables include non-exchange and average condition. The absolute values of the t-statistics are presented in parentheses. *Significant at the .05 level

Figure 1
Hedonic Price Index of Phoenix Apartment Properties



Appendix Table 1
Descriptive Statistics of the Transaction Data
Apartment Properties, Phoenix 1990-1997

Variable	Mean	St. Dev.	Minimum	Maximum
Sales Price	$1,754,900	$3,636,000	$80,000	$33,600,000
Number of Units	64.54	104.04	2	1140
Building Area (Sq. Ft.)	49,301	80,133	1,600	779,390
Covered Parking Spaces	46.45	100.49	0	1140

Frequency of Dichotomous Variables

Variable	Mean	Observations
Total Observations		2975
Project Amenities		
Swimming Pool(s)	.4558	1356
Clubhouse	.1109	330
Laundry	.1758	523
Tennis Court(s)	.0544	162
Condition		
Excellent	.0155	46
Good	.2128	633
Average	.6491	1931
Fair	.1082	322
Poor	.0114	34

[1]The "three property rule" is one of several options with respect to the identification of replacement properties. However, since the three-property rule is the most common, our discussion focuses on this option. For more complete discussion on the other identification options see Cuff (1997, 1998) and Hudson (1998).

[2] In the context of non-exchange topics, Downs and Slade [1999] and Munneke and Slade [1999] include an exchange variable in hedonic price analysis of office property prices. In both cases, the data did not allow for identification of the exchange status, e.g., if the transaction was part of the exchange participant's relinquished property or the replacement property. All that was known was that the transaction was part of an exchange. In both cases the parameter on the exchange variable was positive and significant.

[3] See Dann, Mayers, and Raab (1977), Mikkelson and Partch (1985), Harris and Gurel (1986), Shleifer (1986), Loderer, Cooney, and Van Drunen (1991), Simon (1994), and Babbel, Merrill, Meyer, and de Villiers (2000).

[4]Also relevant is the possibility of buying the replacement property first and then marketing the property to be relinquished in a process known as a reverse Starker exchange. The advantage of the reverse Starker is that, because Section 1031 is stated in the negative and is forward looking, the stringent time constraints that apply to a normal exchange do not apply to the reverse exchange. Several authors, including Sommers (1988), Killip and DeLeo (2000), and Raitz and Raitz (2000), propose reverse exchanges as a means of circumventing the compliance risk associated with forward exchanges. Hence, the participant seeking to relinquish an asset in either a forward or reverse exchange is unlikely to experience significant pressure to accept an unfavorable price.

[5] Comps InfroSystems Inc. provided the transactions data used in this study. Comps InfoSystems Inc. compiles real estate transaction data in many areas of the U.S. including the Phoenix Metropolitan area. The authors thank Craig Farrington and Shawn Van Pelt at Comps InfoSystems Inc. for their generous assistance with the data.

[6] The capital gains tax rate changed from 28% to 20% in May of 1997 (the last year of our sample). The rate at which capital gains were taxed in 1997 depended on when the relinquished asset was sold. Hence, if the full 180 day period was consumed in the exchange process, only observations from November and December of 1997 would involve replacement asset acquisitions in which the gains on the sale of the relinquished asset would have been subject to the new capital gains rate. Therefore, the 28% capital gains rate is considered more pertinent in this analysis.

[7] The index was constructed from a dataset of 2975 apartment transactions covering 1990 through 1997. Detailed exchange data were only available in this dataset starting in September 1995, therefore, the investigation of the exchange variable was limited from September 1995 through the end of 1997. See appendix table 1 for descriptive statistics of the entire dataset.

[8] We define an ideal exchange as one where the relinquished and exchanged properties have the same value per square foot and the same number of square feet. Further, the relinquished property in the ideal exchange has full benefit of the 61% appreciation estimated in our hedonic price index.

[9] In our idealized exchange, the relinquished property and the replacement property have the same price per square foot and the same number of square feet. Hence, the sales price per square foot for the relinquished property is $31.87 (i.e., the non-exchange price estimated from our pricing model). To infer the unobservable ?, the dollar amount of capital gains to be deferred, we assume that the relinquished property has full advantage of the estimated 61% appreciation over the exchange participants holding period. Therefore, the relinquished property must have been purchased for $19.80 per square foot (31.87 / 1.61). Thus, the estimated ? is the sales price of the relinquished asset minus the estimated purchase price of the relinquished asset, or $31.87 - $19.80 = $12.08 per square foot.