Journal of Real Estate Finance and Economics, 13: 255–262 (1996)

Contract Expiration and Sales Price

PAUL K. ASABERE
School of Business and Management, Temple University, Philadelphia, PA 19122

FORREST E. HUFFMAN
School of Business and Management, Temple University, Philadelphia, PA 19122

ROSE L. JOHNSON
School of Business and Management, Temple University, Philadelphia, PA 19122

Abstract

This article represents the first empirical attempt to detect the relationship between sales price and listing (or contract) period. Specifically, we examine the relationship between sales price and contract expiration days. Our hypothesized positive relationship between sales price and contract expiration days is borne out by the results of this study. These results show that the home seller is able to exact a price premium of 0.04% per contract day that he/she is able to preserve. Alternatively stated, he/she will concede a price discount of 0.04% per day, on average, as the sales contract approaches its expiration. Simple analyses of time on the market (TOM) without controlling for listing period may yield misleading signals.

Key Words: contract expiration; time on the market; listing period

There are numerous studies on the trade-off between time on the market (TOM) and sales price in the real estate literature. Notable examples include Cubbins (1974), Belkin et al. (1987), Miller (1977), Trippi (1977), Miller (1978), Allen et al. (1987), Haurin (1988), Miller and Sklarz (1988), Larsen and Park (1989), Asabere and Huffman (1993a); Asabere and Huffman (1993a; 1993b). Generally, these studies have focused on the extent to which TOM affects the pricing of the asset.

Overall, the above-cited studies have yielded conflicting results. Most of these studies show varying relationships between time on the market and selling price. Some studies have supported the bid-capture theory, which says that the longer a property stays on the market, the higher is the probability that a relatively superior selling price can be captured (Trippi, 1977; Miller, 1978; Asabere and Huffman, 1993a). However, Cubbins (1974) and others find an inverse relationship between selling price and time on the market and conclude that a house can be sold faster the lower the price attached to it.

Several other empirical studies have found that the ratio of selling price to list price is negatively related to time on the market (Belkin et al., 1976; Miller 1977). These results are not inconsistent with the bid-capture theory. Instead, a house left on the market a long time might receive both a higher transaction price and a larger discount from asking price than the same house put on the market a short time with a low asking price. In essence, the longer the property remains on the market, ceteris paribus, the greater the concession from listing price (Larsen and Park, 1989).

Further reconciliation of previous findings will be gained when it is explicitly recognized that TOM is a relative phenomenon, such that an extra day of TOM will be valued differently by different home sellers, depending on their opportunity cost of time. TOM, therefore, must be interpreted within a broader framework that allows us to consider differences in home seller "opportunity cost horizons." In this study, we examine the relationships between sales price and TOM with reference to the home seller's opportunity cost of time.

The balance of this article is organized in the following manner: after presenting the theoretical framework, we proceed to a discussion of the data examined, report some empirical results, and close by summarizing the results and drawing some implications.

1. The Theoretical Framework

The typical home sale in the United States must specify, in the listing agreement, the listing period involved. It is the total number of days from listing agreement to the date on which the listing contract would expire. Generally speaking, the listing period is negotiable.

The premise of this study is that the home seller will seek a listing period that corresponds to his/her "opportunity cost horizon."[1] Factors influencing a home seller's opportunity cost include: relocation, purchase of a new home (and possibility of carrying two mortgages), divorce, spousal death, loss of job, and so forth. Consider a home seller whose opportunity cost is huge, that is, one who must realize a quick sale in order to maximize the present value of net selling price. All other influential factors considered, he/she would have preference for a listing period that is relatively short. On the other hand, all other factors considered, a home seller with low opportunity cost would have preference for a listing period that is relatively long. The latter behavior would be consistent with the bid-capture theory, which says that the longer a property stays on the market, the higher the probability of attracting a relatively superior selling price (Trippi, 1977; Miller, 1978).

The broker, in order to protect the listing contract, might prefer a longer listing period, all other factors considered, but would have no problems aligning with a client who prefers a shorter contract, since completing the transaction relatively quickly generates goodwill along with increased ability to move on the next transaction. Thus, the listing period may serve as a good proxy for home seller opportunity cost. The listing period is therefore an important factor for analyzing the relationships between sales price and marketing period.

The principal hypothesis of this study is that the sales price of the ith home will be affected by the likelihood of expiration of the listing contract, which can be defined as the residual of the listing period (LISTP) less time on the market (TOM) as presented formally below. Let us begin with the following definitions:

$$\text{LISTP} = \text{the listing period (i.e., the number of days specified by the listing contract),}$$

$$\text{TOM} = \text{time on the market,}$$

$$\text{LISTP} > \text{TOM : data restriction,}$$

$$(\text{LISTP} - \text{TOM}) = \text{contract expiration days (i.e., number of days prior to expiration of listing contract).}$$

Then,

$$SP_i = f((\text{LISTP} - \text{TOM}); \ldots) \quad (1)$$

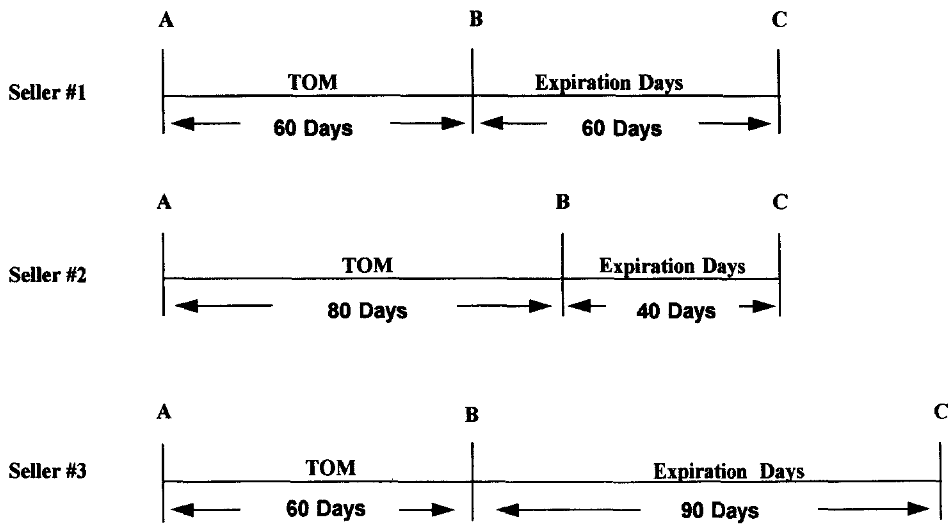

Figure 1. The relationship between TOM and contract expiration. With constant LISTP (Seller #1 vs. Seller #2), the relationship between sales price and TOM will be negative, as TOM serves as a proxy for expiration days. With variable LISTP (Seller #1 vs. Seller #3), "offer-acceptance" strategies will be different, as sellers face different time constraints.

Of course, if you assume the LISTP is constant (an implicit assumption in several TOM studies), the TOM serves as a proxy for (LISTP − TOM) as shown in Figure 1. On the other hand, if you assume that LISTP varies from contract to contract, then (1) is the correct formulation of our hypothesis. Specifically, we hypothesize the relationship between SP_i and the variable of interest, (LISTP − TOM), to be positive. A positive relationship between sales price and contract expiration days implies that the longer the number of days prior to expiration, the higher the sales price, and vice versa. Arguments for the hypothesized relationship include the following:

The reservation price argument. Search theory (see Cronin, 1982; Lipman and McCall, 1986; Wheaton, 1990; and Yavas, 1992) tells us that both the home seller and home buyer face substantial search costs due to imperfect information. Potential seller search costs consist of uncollected rent, additional mortgage payments, maintenance expenses, and so forth. Contract expiration signals likelihood of continuing (or rising) search costs and other seller opportunity costs. It produces panic, disappointment, and a "no-end-in-sight syndrome." This syndrome may occur whether contract renewal is costless or costly. Generally speaking, reservation prices will decrease as home sellers' opportunity costs rise. Assuming a direct relationship between reservation prices and actual sales prices, we expect that as contract expiration approaches, lower reservation prices will lead to real price discounts and/or other marketing incentives or seller concessions.

The risk argument. Risk-averse sellers might choose a shorter listing (or contract) period, because it allows them to have the option of changing brokers. Risk-averse sellers would also seem more likely to underprice the property. Hence, one would see an association between shorter listing periods and lower transaction prices. On the other hand, a risk-seeking seller might choose a longer listing period, because, according to the bid-capture theory, the longer the property stays on the market, the higher is the probability that a superior selling price can be captured. Risk-seeking sellers would seem more likely to overprice the property. Hence, one would see an association between longer listing periods and higher transaction prices.

From the viewpoint of the broker, a longer listing period would generally be preferred, since a shorter listing period represents contract risk. This is the likelihood that the broker will not be able to sell the home and collect his/her part of the commission before the contract expires. In general, a strong likelihood of expiration decreases the future states of the world in which the contract is valid. The broker, however, would have no problem aligning with a risk-averse client who might prefer a shorter listing period, since risk-averse sellers are also more likely to underprice the property and thus increase the property's marketability. Of course, any discounting behavior by the seller as the contract approaches expiration would not be inconsistent with broker interest.

To obtain evidence of the partial effects of listing contract expiration on home price, we employ a hedonic equation of the standard form, as in Rosen (1974), Crether and Mieszkowski (1974), and King (1973). This is represented by (2), below,

$$LogSP_i = Log\beta_0 + \beta_1[(LISTP - TOM)] + \sum_{j=2}^{n} \beta_j X_{ij} + \epsilon \tag{2}$$

where $LogSP_i$ = the sales price of the ith home in natural logarithms;

LISTP = the listing period (i.e., the number of days specified in the listing contract);

TOM = time on the market;

(LISTP−TOM) = contract expiration period (i.e., the number of days before listing contract expires). Contract expiration days can be directly measured by counting the number of days from agreement of sale to the date listing contract would have expired. Ex post, listing expiration days equal (LISTP − TOM);

X_{ij} = controls for physical characteristics, locational characteristics, and market characteristics (these are defined in Table 1)

$Log\beta_0$ = constant term;

ϵ = a random error term.

The coefficient β_1 in (2) is expected to be significantly positive ($\beta_1 > 0$). This would support the hypothesis of this study. There are obvious reasons why the specific functional

Table 1. Summary statistics.

Variable	Definition	Mean	Min	Max
TOM	Time on the market	93.71	0.0	330.0
LISTP	Listing (contract) period	202.27	60.0	720.0
(LISTP − TOM)	Contract expiration days	108.56	30.0	390.0
GOLF	(1,0) dummy variable for view of golf course	0.26	0.0	1.0
COLONL	(1,0) dummy variable for colonial style home	0.43	0.0	1.0
STORIES	Number of stories in building	1.77	1.0	4.0
BEDS	Number of bedrooms	3.26	1.0	5.0
BATHS	Number of bathrooms	2.23	1.0	4.0
DRAREA	Size of dining room area (sq. ft.)	125.27	64.0	192.0
KITAREA	Size of kitchen area (sq. ft.)	153.82	64.0	286.0
NOBASMT	(1,0) dummy variable for no basement	0.33	0.0	1.0
FIREPL	Number of fireplaces	0.98	0.0	2.0
GARAGE	Size of garage (two-car etc.)	1.22	0.0	2.0
POOL	(1,0) dummy variable for pool	0.09	0.0	1.0
AGE	Age of building in years	17.18	2.0	30.0
LOTSIZE	Size of the lot (1000 sq. ft.)	11.40	1.3	28.3
CULDESAC	(1,0) dummy variable for cul-de-sac location	0.14	0.0	1.0
UNPLY	Unemployment rate	6.56	5.0	8.0
TIME	Continuous month-of-sale variable	19.29	1.2	30.4
SP_i	Sales price (1000 dollars)	137.92	65.5	235.0

form represented by (2) is adopted. First, we are principally interested in measuring price discounts (or premiums) associated with contract expiration days. Second, the relationships between sales price and several property and market characteristics have been established by several studies to be chronically nonlinear (see, for example, Kowalsky and Colwell, 1986; Colwell and Sirmans, 1978). The next section presents the data description and the results of our empirical analysis.

2. The Data and the Estimation Results

The data consist of 97 residential sales from March 1992 to September 1994 within a homogeneous neighborhood in Mt. Laurel, New Jersey, as collected from the local MLS. Contained within a single zip code, the sales are a combination of available housing styles (mainly two-story colonials and ranches). The sales surround a local golf course, and a variable is included to measure the course's impact. Available data collected from the MLS include sales price, listing date, sales date, and contract expiration date. Other variables collected from the MLS listing include standard building-specific attributes such as style of house (colonial, ranch, townhouse, and so forth), number of stories, number of bedrooms, number of bathrooms, size of dining area, size of kitchen area, number of fireplaces, size of garage, presence of basement and pool, age of building, size of the lot, cul-de-sac location, time-of-sale, unemployment rate, and so forth. These items are used as control variables for our study. Descriptive statistics and definitions for all variables are reported in Table 1.

Table 2. Regression results (dependent variable is $LogSP_i$).

	Model 1			Model 2			Model 3			Model 4		
Variable	β	t-ratio	VIF	β	t-ratio	VIF	β	t-ratio	VIF	β	t-ratio	VIF
TOM	−.00007	−.396	1.4	—	—	—	−.0003	−1.73	2.3	—	—	—
LISTP	—	—	—	0.0002	1.55	1.4	.0004	2.30*	2.3	—	—	—
(LISTP − TOM)	—	—	—	—	—	—	—	—	—	.0004	2.35*	1.3
GOLF	.096	3.47*	1.2	.086	3.18*	1.2	.092	3.40*	1.2	.091	3.47*	1.1
COLONL	.042	1.10	2.9	.052	1.34	3.0	.061	1.58	3.0	.061	1.60	3.0
STORIES	.081	2.58*	2.6	.067	2.13*	2.7	.066	2.12*	2.7	.066	2.14*	2.7
BEDS	.110	4.50*	5.8	.108	4.50*	5.8	.110	4.64*	5.8	.110	4.68*	5.8
BATHS	.035	0.84	3.2	.036	0.89	3.2	.046	1.13	3.3	.046	1.13	3.3
Log(DRAREA)	.293	4.32*	2.7	.323	4.90*	2.6	.303	4.58*	2.7	.305	4.83*	2.5
Log(KITAREA)	.116	2.29*	2.6	.120	2.39*	2.6	.116	2.36*	2.6	.116	2.38*	2.6
NOBASMT	.009	0.18	4.3	.012	0.24	4.3	.017	0.36	4.4	.017	0.36	4.4
FIREPL	.104	2.83*	1.1	.108	3.01*	1.1	.097	2.72*	1.1	.098	2.78*	1.1
GARAGE	.116	4.96*	2.6	.118	5.10*	2.5	.113	4.95*	2.6	.114	5.01*	2.6
POOL	.011	0.27	1.2	.023	0.57	1.2	.018	0.44	1.2	.019	0.47	1.1
AGE	−.005	−2.33*	3.2	−.005	−2.19*	3.2	−.005	−2.28*	3.2	−.005	−2.30*	3.2
Log(LOTSIZE)	.009	0.25	1.3	.012	0.32	1.3	.003	0.09	1.3	.004	0.10	1.3
CULDESAC	.036	1.04	1.2	.032	0.94	1.2	.040	1.17	1.2	.039	1.18	1.2
UNPLY	.013	0.45	2.1	.023	0.81	2.1	.017	0.59	2.1	.017	0.63	2.0
TIME	−.002	−0.72	2.4	−.003	−0.12	2.3	−.001	−0.44	2.4	−.001	−0.44	2.1
CONSTANT	8.885	15.90*	—	8.570	16.01*	—	8.802	16.14*	—	8.78	17.43	—
Adjusted R^2	0.89			0.89			0.89			0.89		
F	44.64*			46.04*			44.75*			47.98*		

* denotes significance at the 95% level of confidence
— not included in model.

We tested four alternative models as shown in Table 2. Models 1 and 2 include only TOM and LISTP, respectively. Model 3 includes both TOM and LISTP (i.e., Model 3 controls for LISTP, while observing TOM or vice versa). Model 4 tests the principal hypothesis of this study by including our variable for contract expiration days (LISTP − TOM). The adjusted coefficient of determination for all models in Table 2 is 0.89. These are relatively high as compared with much hedonic work on home values. The use of several variables in a single regression equation, as represented by Models 1, 2, and 3, introduces the potential problem of multicollinearity. Variance Inflation Factors (VIF) are used in Table 2 to detect the presence of multicollinearity. As can be seen, the VIFs indicate no serious problems of multicollinearity.[2]

In Table 2, the following control variables: GOLF, STORIES, BEDS, Log(DRAREA), Log(KITAREA), FIREPLA, GARAGE, and AGE are significantly different from zero at the 95% level of confidence. All the signs are as expected. Insignificant control variables are: COLONL, BATHS, NOBASMT, POOL, Log(LOTSIZE), CULDESAC, UNPLY, and TIME. All these are conventional house-amenity variables; hence, we need not say much about them.[3]

Our variable of interest, (LISTP − TOM), produces expected results. The estimated coefficient is significantly positive at the 95% level of confidence, as can be seen in Model 4, and the magnitude of 0.0004 is believable. The magnitude of 0.0004 implies that the prospective home seller would extract a price premium of 0.04% per contract day. In other words, the prospective home seller is able to save 0.04% of his/her home value for each contract day that is preserved. Alternatively stated, he/she will concede a price discount of 0.04% per contract day that expires. Using our sample mean value of $138,000, this translates into roughly $55 per contract day. When straight TOM and LISTP are separately employed, as shown in Models 1 and 2, their estimated coefficients are both not significantly different from zero at conventional levels. It is interesting to note that TOM becomes significantly negative at the 90% level after controlling for LISTP, which is also significantly different from zero and positive as expected (see Model 3). This suggests that the impacts of TOM cannot be accurately detected unless a control variable for LISTP is included in the model, granted that LISTP is not constant. These findings are consistent with the hypothesis of this study, as depicted by Figure 1.

3. Summary and Conclusions

This article represents the first empirical attempt to detect the relationships between sales price and listing contract expiration. The hypothesized relationship between sales price and contract expiration has been borne out by the results of this study. The estimated coefficient of 0.04% on (LISTP − TOM) is significantly different from zero at conventional levels with expected sign. These results mean that the home seller is able to exact a price premium per contract day that he/she is able to preserve. Alternatively stated, he/she will make a price concession of 0.04% per day as contract expires. According to our findings, simple analyses of TOM without controlling for LISTP may yield misleading signals and may help to explain conflicting results of past TOM studies. The results of this study suggest the need for further research on the relationships between sales price, TOM, and contract terms.

Acknowledgment

Special thanks must go to an anonymous reviewer for his/her helpful comments. The usual caveat applies.

Notes

1. The listing may also be affected by conditions of the macroeconomy as well as the traditions (or norms) of the local area.
2. With respect to our variables of interest, TOM, LISTP, and (LISTP − TOM), we analyzed their correlation matrix with TIME and other relevant explanatory variables and found no significant problems with correlation coefficients.

3. It must be noted that other specification forms for age, beds, baths, stories, time, and unemployment were tested. These included Log(AGE), AGE, $(AGE)^2$, Log (BEDS), Log(BATHS), Log(STORIES), dummy variables for STORIES, different specifications for TIME, and different lagged-structures for UNPLY. The results were either qualitatively inferior or made no statistical difference and are thus not reported here. We did check for the various orders of autocorrelation in the residuals as well as the typical regression diagnostics and found no serious econometric problems.

References

Allen, P. R., J. D. Shilling, and C. F. Sirmans. (1987). "Contracting, Contingencies and Single-Family House Prices," *Economic Inquiry* 25 (January), 159–164.

Asabere, P. K., and F. E. Huffman. (1993). "Price Concessions, Time on the Market, and the Actual Sales Price of Homes," *Journal of Real Estate Finance and Economics* 6, 167–174.

Asabere, P. K., and F. E. Huffman. (1993). "The Impact of Settlement Period on Sales Price," *Journal of Real Estate Finance and Economics*, 7, 213–219.

Belkin, J., D. J. Hempel, and D. W. McLeavey. (1976). "An Empirical Study of Time on Market Using Multidimensional Segmentation of Housing Markets," *AREUEA Journal* 4 (Fall), 57–75.

Colwell, P. F., and C. F. Sirmans. (1978). "Area, Time Centrality and the Value of Urban Land," *Land Economics* 54, 514–519.

Crether, D. M., and P. Mieszkowski. (1974). "Determinants of Real Estate Values." *Journal of Urban Economics* (April), 127–146.

Cronin, F. J. (1982). "The Efficiency of Housing Search," *Southern Economic Journal* 48(4), 1016–1030.

Cubbins, J. S. (1974). "Price, Quality and Selling Time in the Housing Market," *Applied Economics* 6, 171–187.

Dasso, J., and A. A. Ring. (1989). *Real Estate Principles and Practices,* 11th ed. Englewood Cliffs, NJ: Prentice Hall.

Ferreira, E. J., and G. S. Sirmans. (1989). "Selling Price, Financing Premiums and Days on the Market," *The Journal of Real Estate Finance and Economics* 2 (September), 209–222.

Haurin, D. (1988). "The Duration of Marketing Time of Residential Housing," *AREUEA Journal* 16 (4), 396–410.

Kalra, R., and K. C. Chan. (1994). "Censured Sample Bias, Macroeconomic Factors, and Time on Market of Residential Housing," *The Journal of Real Estate Research* 9, 253–262.

King, A. T. (1973). *Property Taxes, Amenities, and Residential Land Values.* Cambridge, MA: Ballinger Publishing Co.

Kowalski, J. G., and P. F. Colwell. (1986). "Market Versus Assessed Values of Industrial Land," *AREUEA Journal* 14, 361–373.

Larsen, J. E., and W. J. Park. (1989). "Non-Uniform Percentage Brokerage Commissions and Real Estate Market Performance," *AREUEA Journal* 17 (4), 423–438.

Lippman, S. A., and J. J. McCall. (1986). "An Operational Measure of Liquidity," *American Economic Review* 76, 1, 43–55.

Miller, N. G. (1977). "The Influence of Market Transaction Phenomena on Residential Property Values." Unpublished doctoral dissertation, The Ohio State University.

Miller, N. G. (1978). "Time on the Market and Selling Price," *AREUEA Journal* 6 (Summer), 164–174.

Miller, N. G., and M. A. Sklarz. (1987). "Pricing Strategies and Residential Property Selling Prices," *The Journal of Real Estate Research* 2 (1), 31–40.

Rosen, S. (1974). "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy* (January/February), 35–55.

Trippi, R. R. (1977). "Estimating the Relationship Between Price and Time of Sale for Investment Property," *Management Science* 23 (April), 838–842.

Wheaton, W. C. (1990). "Vacancy, Search, and Prices in a Housing Market Matching Model," *Journal of Political Economy* 96, 6, 1270–1292.

Yavas, A. (1992). "A Simple Search and the Bargaining Model of Real Estate Markets," *AREUEA Journal* 20, 4, 533–548.