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Single-Family Housing Transactions: Seller Motivations, Price, and Marketing Time

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Abstract

Factors such as relocation and financial distress motivate the seller of a single-family home to facilitate sale by posting a lower list price, communicating the motivations to the marketplace, or offering sales incentives to agents. Impacts of seller motivations on selling prices and marketing times are estimated using data for single-family homes sold in Arlington, Texas, from 1991 to 1993. Results show selling price discounts for houses with sellers who are either eager, motivated, or anxious, houses with sellers who have relocated, foreclosures, and vacant houses. Only foreclosure houses show the reduced marketing time expected for properties with motivated sellers. The results further suggest that the list price is the seller's primary mechanism for selling the property. Reducing the list price fosters faster sales at the sacrifice of the selling price.

Key Words: single-family housing, foreclosures, seller motivations, time on the market

The seller of a single-family home faces a trade-off between the realized price and the time required to sell the house. With sufficient time and ample negotiation, the seller receives a price that is commensurate with the market value. However, many sellers have a constraint on the amount of time allowed to market the house. Factors that trigger the motivations for a fast sale include relocation, purchase of a new home (holding two mortgages), divorce, job loss, and foreclosure. For any local market for single-family homes, that part of the market represented by distressed properties and motivated sellers is a buyer's market. That is, sellers are normally price-takers, because motivated sellers have less proclivity to negotiate and are willing to accept a lower price.

The study of the seller's impact on the housing transaction is an evolving body of the housing economics literature. Examples of specific seller motivations that have been studied include properties owned by relocated sellers (Turnbull et al., 1990), foreclosure properties (Shilling et al., 1990, Forgey et al., 1994), and vacant properties (Zuelke, 1987). Genesove and Mayer (1994) consider the role of the homeowner's equity position in the determination of marketing time. Glower, Hendershott, and Haurin (1995) consider time constraints on sellers, such as those imposed by a new job or a seller having already made an offer on a new residence.

This article both complements and extends the existing research. By including measures of seller characteristics in two hedonic models, one for marketing time and one for selling prices, we can further assess the impact that sellers have on residential real estate transactions. Data representing 2,317 single-family home transactions in Arlington, Texas, from May, 1991, to June, 1993, are used to estimate the models. In addition to a standard set

of variables describing property and market characteristics, the models include proxies for seller motivations.

The empirical results show that seller motivations affect both marketing times and the selling prices of single-family homes. The results show that a seller, described as either eager, motivated, or anxious to sell, accepts a discount, but faces a longer time on the market. Houses owned by a relocated owner sell at a discount from the selling price, but no faster than other houses. Houses with a recent foreclosure history sell faster and at a discount. Vacant houses sell for less, but take longer to sell. Also, reducing the list price results in faster sales at the expense of lower expected selling prices. Finally, the results differ considerably when comparing lower-priced houses to higher-priced houses.

Overall, the results support the existence of informational imperfections in the market for single-family housing. Because seller characteristics affect the selling process, opportunities exist for buyers to purchase houses at below-market prices. The ability of the buyer to identify motivated sellers and to capitalize on the price discounts is dependent upon the availability and quality of the relevant information.

1. Motivated Sellers and Residential Real Estate Transactions

In a heterogeneous market such as the residential real estate market, prices result from negotiations between sellers and prospective buyers.[1] For a specific property, the seller of the property has a reservation price, P_R, that sets the minimal price the seller will accept for the property. Starting at the list price, L, with $L \geq P_R$, the seller searches the pool of available buyers for an acceptable offer. The buyers have reservation prices representing the maximum price each buyer is willing to pay for a given property. Buyers make offers based on information gained during the search for housing.

As the seller receives offers over time, the seller must evaluate each offer. The seller must choose either to accept the known offer or to reject that offer and wait for another offer. The seller's decision is a function of the buyer's offer price, the seller's reservation price, and the distribution of offers over time. For an offer to be accepted, the offer price, P_B, must equal or exceed P_R. The final transaction price, P_{Tr}, the result of the sequence of offers, must be bounded by P_R and P_B. The negotiation process determines the exact magnitude of P_{Tr}. The process of searching a pool of potential buyers for an acceptable offer is sequential, and ends upon the completion of the sale. Quan and Quigley (1991) provide a thorough treatment of price determination and price dispersion in a real estate market.

Compared to most markets, the residential real estate market requires more search because of market thinness caused by the heterogeneity of the product and decentralized trading. The search process imposes costs on sellers as they search the marketplace for an acceptable offer. For the seller, search costs can consist of uncollected rent, additional mortgage payments, maintenance expenses, selling expenses, and time. The level of the seller's search costs, C, affects the seller's reservation price, P_R, the expected transaction price, $E(P_{Tr})$, and the expected time on the market, $E(T)$.

$$dP_R/dC < 0 \tag{1}$$

$$dE(P_{Tr})/dC < 0 \tag{2}$$

and

$$dE(T)/dC < 0 \tag{3}$$

As seller search costs increase, seller reservation prices decrease (see Lippman and McCall, 1976, p. 160), expected transaction prices decrease, and the time the property is expected to remain on the market decreases (see Arnott, 1989; Haurin, 1988).

For the seller, the direct financial outcome of the sale of the house is the price received, P_{Tr}, less the costs of selling the house, C.[2] Thus, a seller seeks to maximize $(P_{Tr} - C)$. As the seller receives offers, the seller must decide whether to accept the offer or to continue the search. As long as the incremental increase is the price received resulting from another search, ΔP_B, continues to exceed the incremental increase in costs associated with selling the house, ΔC, the seller benefits by having continued the search. A motivated seller is one having high search costs, often in the form of a time constraint. As search costs increase, sellers decrease the effort (search intensity) devoted to the search process (Yavas, 1992). Because of the high search costs, the motivated seller seeks to sell the property more quickly, and is willing to sacrifice on the eventual selling price. Conventionally defining the value of a property as "the price commanded in the marketplace in an arm's length transaction within a reasonable marketing time" and recognizing that both price and value are time-dependent, then there exists a tangible probability that $P_{Tr}(t) < V(t)$. That is, the property offered by a motivated seller is likely to sell at a discount, with the size of the discount changing over time.

Sellers convey information to prospective buyers. A motivated seller has the incentive to convey additional information that identifies the property as one having an owner with a short time preference and a potential willingness to accept a discount for an expedient sale. By releasing information indicative of a motivation to sell, the motivated seller lowers the search costs to all buyers, thus increasing the pool of buyers and making the market more efficient. With timely release, information of sufficient quality and quantity can increase the frequency of offers, decrease the expected marketing time, and reduce the anticipated discount from the market value.

Although costly, the use of a real estate broker disseminates information more efficiently and speeds up the search for an acceptable offer by giving the property better access to the market. A seller uses a broker when the perceived benefits of using the broker exceed the costs (i.e., the commission). Because of the high search costs compared to those of the average seller, a motivated seller is more likely to use a real estate broker. A motivated seller is also more likely to use a Multiple Listing Service (MLS) member broker as opposed to a broker not affiliated with the MLS. Frew (1987) demonstrates that listing brokers have the incentive to withhold seller information from the market. However, motivated sellers have an incentive to release information to the market. Through the MLS, this information reaches more market participants.[3]

One mode of information conveyance is the list price, L. A higher L relative to the property value, V, has opposing impacts on the marketability of residential real estate. Overpricing can result in a higher price paid, P_{Tr}, because of information asymmetries inherent

to the negotiation process. However, an excessively high list price creates a thinner market and increases the probable marketing period. Yavas and Yang (1995) find that overpricing increases the marketing time for mid-price houses, but not for houses in lower or higher price ranges. Haurin (1988) offers, but does not test, a hypothesis that buyers restrict their search to a range of list prices. Compared to a non-motivated seller, a motivated seller lists the property at a lower L relative to V because a lower L expands the market and reduces search costs.

Another example of a motivated seller is one that is relocating. Turnbull et al. (1990) find no difference in selling prices for corporate-owned relocation houses compared to non-corporate-owned houses. A relocating homeowner faces double the necessary consumption of housing until the house at the previous location sells. The relocated seller remains responsible for any mortgage and maintenance expenses and property taxes, as well as the costs of housing at the new location. To negate the costs of keeping two homes, a transferred or relocating homeowner can become an absentee landlord. Tenant-occupied houses are more difficult to market given the impediment the existing lease places on the availability of the house for occupancy by the new owner. Although seller motivations are not precluded, tenant-occupied houses are a productive asset, and thus not purely indicative of seller motivation.

The alternative to leasing the house is to leave the house vacant until it sells. However, a vacant house suggest both distress and potential neglect. As a result, vacant houses trade in a thinner market. Sellers of vacant houses expect longer marketing times accompanied by discounts from market value (Zuehlke, 1987). Because they represent an unproductive asset, vacant houses offer evidence of seller motivation.

Another category of owners, likely to be motivated sellers, are those holding distressed properties. Financial institutions are the typical owners of properties with a recent foreclosure history. These institutions incur carrying costs when holding an inventory of foreclosure properties. Two studies (Shilling et al., 1990; Forgey et al., 1994) show that foreclosure properties sell at a discount relative to other houses; both studies find a discount of approximately 23%. This liquidation discount suggests that sellers of foreclosed properties are motivated sellers with lower reservation prices and higher search costs. Appraisers recognize that sellers of foreclosure properties typically accept a lower value to facilitate the sale, and estimate value accordingly. The liquidation discount (the amount that the seller is willing to forego to have a short marketing time) is the difference between market value and net realizable value, where net realizable value is an estimate of the fair market value of the property, assuming a short marketing time (Shilling et al., 1990).

A motivated seller can enhance compensation to the real estate broker who eventually sells the house. Selling bonuses can be in cash or in noncash incentives such as resort vacations or cruises. A seller will pay a bonus either to expedite sale, in which case the seller expects a lower selling price, or to meet a stipulated price, in which case selling time is likely to increase. Geltner et al. (1992) shows that the standard percentage commission may be insufficient motivation for a real estate broker, and that additional incentives may be necessary to align the interests of the broker with those of the seller.

Finally, a seller can be perceived as anxious, eager, ready to sell, or motivated, thus suggesting to the market a willingness to negotiate, and increasing the frequency of potential buyers. Although this type of information conveys the potential of seller motivations to the market, the validity of the advertised claim is less confirmable than the other claims of

seller motivation. Thus, individual buyers will interpret the meaning and the context of this information differently.

2. Models of Seller Motivations

The selling prices and the marketing times of residential real estate are modeled as a function of physical property characteristics, local market conditions, and seller motivations. Past models of residential real estate transactions have focused on property characteristics, H, including the age, the condition and the size of the house, the lot size, any utility bearing features of the property, and locational characteristics such as accessibility and the perceived quality of the local school district. Real estate market characteristics, M, are external economic influences that affect the real estate transaction. Seller motivations, O, include circumstances such as changing personal financial conditions or job transfers that increase the motivation of the owner to sell a property.

Two models of residential real estate transactions are proposed, a selling price model,

$$\ln P_i = \mathrm{B}_0 + \sum_{j=1}^{k} \mathrm{B}_j H_i + \sum_{j=k+1}^{l} \mathrm{B}_j M_i + \sum_{j=l+1}^{m} \mathrm{B}_j O_i + e_i \tag{4}$$

and a time-on-the-market model,

$$\ln T_i = \mathrm{B}_0 + \sum_{j=1}^{k} \mathrm{B}_j H_i + \sum_{j=k+1}^{l} \mathrm{B}_j M_i + \sum_{j=l+1}^{m} \mathrm{B}_j O_i + e_i \tag{5}$$

with P_i = the negotiated selling price for property i,

T_i = the time on the market for property i, defined as the time in days from the listing of the property to an agreed upon sale, given that the sale was finalized,

H_i = a vector of physical characteristics descriptive of property i,

M_t = a vector of market characteristics descriptive of market conditions while property i was on the market,

O_i = a vector of characteristics descriptive of the motivations of the seller of property i,

B_j = a vector of model parameters,

and

e_i = a random error term.

2.1 The Data and the Choice of the Variables

Data on 3,260 transactions of residential properties in Arlington, Texas, listed between May 1989 and May 1993 and sold between May 1991 and June 1993, were collected from the Arlington multiple listing service (MLS).[4] The data represent an active residential market. Estimating the equations with the MLS data restricts generalizing the results because the data consist only of broker-sold houses. Also, certain hypotheses are not testable because of the incompleteness of the data.[5]

The property characteristics, H_i, account for the contribution of physical features and tenancy on selling prices and marketing times. The H_i are represented as follows: *Age,* the age of the house in years; *Size,* the square footage of the house (in hundreds of square feet); *Bathrooms,* the number of bathrooms; *Bedrooms,* the number of bedrooms; *Fireplace, Pool, Landscaping, Garage,* and *Wooded Lot,* binary variables with 1 indicating the presence of the described feature; and *Tenant,* a binary variable with 1 indicating the house is tenant-occupied. The H_i are invariant over the marketing period.

Various aspects of the market environment affect the single-family housing market. The market factors, M_i, in the model include the season of the listing/sale and the housing price time-trend. The prefix, *S*, denotes the market variables for the selling price equation (4), which are measured relative to the contract date, the date when the buyer and seller mutually agree on the selling price. For the time-on-the-market model (5), the market variables are measured relative to the date of listing and include the prefix, *L*. Three variables, *Spring, Summer,* and *Fall,* account for seasonality. The variable, *Spring* (List/Sale), is binary, with 1 indicating a house listed/sold in March, April, or May. Similarly, *Summer* (List/Sale) accounts for houses listed/sold in June, July, or August. *Fall* (List/Sale) accounts for houses listed/sold in September, October, or November. Two additional variables measure any contemporaneous trends over the measurement period. In the selling price equation (4), *Date of Sale* is the number of months by which the date of sale follows January, 1991. In the time equation (5), *Date of Listing* is the number of months by which the date of listing follows January, 1989.

The selling price model includes the marketing time, T, to proxy for both seller search effort and market effects. Time on the market is measured as the number of days between the date of the original listing and the date of a sales contract that eventually leads to the sale of the property. The hypothesis derived from search models is that the expected selling price increases as the seller more thoroughly searches the market for the highest offer. Longer marketing times correspond to more thorough searches.[6]

Finally, seller characteristics, O_i, proxy for and measure the impact of the seller on the selling prices and marketing times for residential real estate transactions. The seller motivation variables include the following: *Negotiating Pad,* a measure of initial pricing calculated as the percentage difference between the listing price and the value of the property estimated as of the time of listing; *Eager,* a binary variable, with 1 indicating the seller "is motivated, is anxious, or must sell"; *Relocated,* a binary variable, with 1 indicating the seller has been transferred or otherwise relocated; *Selling Bonus,* a binary variable, with 1 indicating the seller is willing to pay additional compensation to the selling broker for either a timely sale or for meeting a specified price; *Foreclosure,* a binary variable, with 1 indicating a house

with a foreclosure history; and *Vacant,* a binary variable, with 1 indicating the house is unoccupied.

The binary variables are created directly from the MLS property listing descriptions. In some cases, the variables account for the presence of a word or phrase in the comments section of the MLS property description. For instance, an eager seller is one whose listing description includes the words "motivated, anxious, or must sell." A relocated seller is one whose listing description includes the words, "transferred, relocated, or moved." For the selling bonuses, when additional information was available from the MLS property description, the information was insufficient to create a quantitative measure to account for the value of these sales incentives.

The estimation of the negotiating pad requires an estimate of the value of the property at the time of listing. For this purpose, a sample of 505 observations, cleansed of all sales with the seller classified as motivated, is used to estimate a selling price model based on the property and market characteristics.[7] The expected selling prices for the remainder of the sample are estimated using the coefficients from this model. To estimate value at the time of listing, *L-Property value,* the predicted selling prices are adjusted to the time of listing using a local housing price index based on the median value of houses sold.[8] The variable, *Negotiating Pad,* is calculated as

$$Negotiating\ Pad = \frac{(Original\ Listing\ Price - L\text{-}Property\ Value)}{L\text{-}Property\ Value} \tag{6}$$

Values of *Negotiating Pad* greater than zero indicate overpricing. The 505 observations used to estimate *L-Property value* were dropped from the sample.

Preliminary runs of the model showed excess dispersion to be evident in the variables estimated from the regression on the held-back sample. This excess dispersion is a consequence of prediction error (*Predicted Selling Price − Actual Selling Price*). To reduce the impact of outliers, all observations of the percentage prediction error ((*Predicted Selling Price − Actual Selling Price*)/*Actual Selling Price*) and the estimated negotiation pad having values exceeding +/− two standard deviations from the mean were dropped.[9] An additional 119 observations were eliminated, leaving a final set of data that includes 2,317 observations. Table 1 summarizes the final data set.

For further insight, the data were split into two parts. One sample consists of 1,433 observations characterized as non-motivated sellers. The other 884 observations represent motivated sellers, identified as any observation having a value of 1 for either *Eager, Moved, Selling Bonus, Foreclosure,* or *Vacant.* Physical property characteristics are similar across the two samples. The average time on the market is slightly longer for the motivated seller sample, but the difference in means is not statistically different from zero. The differences between motivated and non-motivated sellers are most evident for *Tenant* and the price variables, *Negotiating Pad* and *Selling Price.* Compared to motivated sellers, three times as many non-motivated sellers are selling a tenant-occupied property. Motivated sellers, compared to non-motivated sellers, have a smaller negotiating pad (mean value of 2.67% versus 11.45%) and sell for a lower price (mean value of $82,996 versus $97,010).

There is also considerable interaction between the seller motivation variables (see Table 2). Vacant and foreclosure properties dominate the sample. Nearly 90% of the

Table 1. Data characteristics ($N = 2317$).

Variable	Mean	Standard deviation	Minimum	Median	Maximum
Selling Price	91,664	48,548	17,450	80,000	560,000
Time on the Market	120.88	112.53	0	82	671
L-Property Value	90,652	43,598	22,470	81,300	810,300
Original Listing Price	98,933	54,602	22,000	85,000	625,000
Physical Characteristics (H)					
Age	14.022	9.932	0	12	72
Size	18.769	6.181	6.62	17.52	61.38
Bathrooms	2.193	0.578	1	2	5.5
Bedrooms	3.273	0.536	1	3	6
Fireplace	0.887	0.317	0	1	1
Pool	0.115	0.317	0	0	1
Landscaping	0.280	0.449	0	0	1
Garage	0.969	0.172	0	1	1
Wooded Lot	0.232	0.422	0	0	1
Market Characteristics (M)					
Spring (List)	0.207	0.405	0	0	1
(Sale)	0.348	0.476	0	0	1
Summer (List)	0.271	0.445	0	0	1
(Sale)	0.190	0.393	0	0	1
Fall (List)	0.258	0.438	0	0	1
(Sale)	0.180	0.384	0	0	1
Tenant	0.023	0.151	0	0	1
Date of Sale (Time) (List)	28.360	6.384	5	29	41
(Sale)	20.292	5.201	5	20	30
Seller Characteristics (O)					
Negotiating Pad (%)	0.081	0.205	−0.451	0.063	0.645
Eager	0.052	0.221	0	0	1
Relocated	0.049	0.216	0	0	1
Selling Bonus	0.021	0.142	0	0	1
Foreclosure	0.117	0.321	0	0	1
Vacant	0.281	0.450	0	0	1

foreclosure properties are also vacant. However, less than 40% of vacant properties are foreclosures. Of properties whose owners have relocated, approximately one-eighth of them are vacant. One-third of the properties whose owners offered incentive bonuses to the selling broker are vacant.

3. Results

The dependent variable for the selling price model is the natural logarithm of the selling price. The dependent variable for the time on the market model is the natural logarithm of the marketing time, T. To account for expected nonlinearity, the continuous time trend variables and *Negotiating Pad* are included on the quadratic form. For both models, the

Table 2. Frequency of occurrence (interaction) of the seller motivation variables.
(% of Category having characteristic)

Category	*Eager*	*Relocated*	*Selling Bonus*	*Vacant*	*Foreclosed*
Eager	120	7	9	30	2
	(100.0%)	(5.8%)	(7.5%)	(25.0%)	(1.7%)
Relocated	7	114	3	14	1
	(6.1%)	(100.0%)	(2.6%)	(12.3%)	(0.9%)
Selling Bonus	9	3	48	16	3
	(18.8%)	(6.3%)	(100.0%)	(33.3%)	(6.3%)
Vacant	30	14	16	652	241
	(4.6%)	(2.1%)	(2.5%)	(100.0%)	(37.0%)
Foreclosed	2	1	3	241	270
	(0.7%)	(0.4%)	(1.1%)	(89.3%)	(100.0%)

To facilitate interpretation of this table, consider the following: of sellers classified as *Eager,* 5.8% are relocated, 7.5% offer a selling bonus, 25.0% have vacant houses, and 1.7% are foreclosure houses. Meanwhile, in this sample, 6.1% of the relocations, 18.8% of the selling bonuses, 4.6% of the vacant houses, and 0.7% of the foreclosures are classified as *Eager.*

standard errors are corrected for heteroskedasticity using a revised covariance estimator (White, 1980). Both models are estimated using the complete data set and for subsets representing higher priced houses (*Selling Price* $>$ \$91,644) and lower priced houses (*Selling Price* $<$ \$91,644), with the data separated at the average selling price.

Table 3 summarizes the results of the selling price model. For all cases, this model shows a consistently high R^2 with most of the coefficients being significant and with the correct sign. Table 4 summarizes the results of the time-on-the-market model. For all cases, this model exhibits a much lower explanatory power than those of the selling price model, with R^2's of approximately 30%. Based on the statistical significance of the estimated coefficients, the results for the time-on-the-market model suggest that market (M_i) and seller (O_i) characteristics are the dominant influences on the expected amount of time a property remains on the market before it sells.

3.1. The Impact of Seller Motivations

The differences in the results between the models suggest that the seller's impact is more apparent on the selling price than on the marketing time. Also, the results provide evidence that the effects of seller motivations differ across housing submarkets. The evidence supporting selling price discounts for motivated sellers and the effects that sellers have on marketing time are both more conspicuous for lower priced houses than for higher priced houses.

The factors reflecting increased seller motivation are expected to show a discount from the predicted selling price. For the selling price model (estimated with the full sample), four of the binary seller motivation variables have coefficients that are significant and imply discounts ranging from 2.1% to 3.7%. Analysis of the subsets shows that lower priced houses

Table 3. Empirical estimates for the selling price model (Dependent variable = log of the selling price).

		Coefficient (Std. error)					
	Variable	Full sample		Higher priced houses		Lower priced houses	
	Intercept	10.1540		10.2560		10.1850	
		(0.0376)		(0.0626)		(0.0519)	
Physical Characteristics (H)	*Age*	−0.0120	***	−0.0110	***	−0.0119	***
		(0.0003)		(0.0005)		(0.0004)	
	Size	0.0347	***	0.0327	***	0.0340	***
		(0.0006)		(0.0009)		(0.0010)	
	Bathrooms	0.1215	***	0.1252	***	0.1211	***
		(0.0058)		(0.0068)		(0.0102)	
	Bedrooms	0.0218	***	0.0126	***	0.0220	***
		(0.0049)		(0.0048)		(0.0083)	
	Fireplace	0.1276	***	0.0341		0.1221	***
		(0.0082)		(0.0285)		(0.0090)	
	Pool	0.1386	***	0.1318	***	0.1310	***
		(0.0054)		(0.0057)		(0.0127)	
	Landscaping	0.0224	***	0.0122	**	0.0280	***
		(0.0035)		(0.0048)		(0.0048)	
	Garage	0.0398	**	0.0706	*	0.0328	*
		(0.0163)		(0.0399)		(0.0175)	
	Wooded Lot	0.0643	***	0.0546	***	0.0659	***
		(0.0043)		(0.0055)		(0.0064)	
	Tenant	−0.3191	***	−0.2800	***	−0.3080	***
		(0.0142)		(0.0431)		(0.0178)	
Market Characteristics (M)	*S-Fall*	−0.0888	***	−0.0891	***	−0.0818	***
		(0.0055)		(0.0080)		(0.0076)	
	S-Spring	−0.0298	***	−0.0254	***	−0.0293	***
		(0.0046)		(0.0058)		(0.0063)	
	S-Summer	−0.0276	***	−0.0356	***	−0.0215	***
		(0.0057)		(0.0076)		(0.0079)	
	Date of Sale (Time)	0.0190	***	0.0233	***	0.0172	***
		(0.0031)		(0.0040)		(0.0042)	
	Date of Sale - Sq	−0.0004	***	−0.0005	***	−0.0004	***
		(0.0001)		(0.0001)		(0.0001)	
	Time-on-the-Market	−0.0003	***	−0.0003	***	−0.0003	***
		(0.0000)		(0.0000)		(0.0000)	
Seller Characteristics (O)	*Negotiating Pad (%)*	0.9319	***	0.8686	***	0.8960	***
		(0.0142)		(0.0244)		(0.0198)	
	Negotiating Pad - Sq	−0.4501	***	−0.4096	***	−0.4303	***
		(0.0402)		(0.0563)		(0.0707)	
	Eager	−0.0209	***	−0.0225	**	−0.0188	**
		(0.0074)		(0.0110)		(0.0091)	
	Relocated	−0.0211	***	−0.0103		−0.0239	**
		(0.0072)		(0.0095)		(0.0096)	
	Selling Bonus	−0.0148		0.0086		−0.0340	*
		(0.0135)		(0.0143)		(0.0206)	
	Foreclosure	−0.0373	***	−0.0411	***	−0.0402	***
		(0.0089)		(0.0143)		(0.0108)	
	Vacant	−0.0248	***	−0.0112		−0.0263	***
		(0.0046)		(0.0072)		(0.0058)	
	N	2317		874		1443	
	R^2	0.968		0.951		0.912	
	F	3025	***	730	***	649	***

Significance levels for T-ratios (***, 0.01; **, 0.05; *, 0.10)

Table 4. Empirical estimates for the time-on-the-market model (Dependent variable = log of the time on the market).

		Coefficient (Std. error)					
	Variable	Full sample		Higher priced houses		Lower priced houses	
	Intercept	7.9917		8.1196		7.8943	
		(0.3787)		(0.6605)		(0.5353)	
Physical Characteristics	*Age*	−0.0002		−0.0043		0.0018	
		(0.0031)		(0.0048)		(0.0043)	
(*H*)	*Size*	0.0048		0.0030		0.0078	
		(0.0060)		(0.0083)		(0.0117)	
	Bathrooms	0.0308		0.1056		−0.0221	
		(0.0586)		(0.0741)		(0.1024)	
	Bedrooms	0.0837		0.0327		0.1598	**
		(0.0471)		(0.0635)		(0.0738)	
	Fireplace	0.0094		−0.3540		0.0296	
		(0.0848)		(0.2461)		(0.1004)	
	Pool	0.0962		0.1306	*	0.1145	
		(0.0601)		(0.0711)		(0.1121)	
	Landscaping	−0.0550		−0.1152	*	−0.0161	
		(0.0459)		(0.0679)		(0.0620)	
	Garage	−0.0545		0.0458		−0.0552	
		(0.1380)		(0.3249)		(0.1494)	
	Wooded Lot	−0.0167		−0.0599		0.0356	
		(0.0506)		(0.0702)		(0.0724)	
	Tenant	−0.1611		−0.5450	**	−0.0587	
		(0.1707)		(0.2722)		(0.2016)	
Market Characteristics	*L-Fall*	0.3945	***	0.3404	***	0.4237	***
		(0.0566)		(0.0888)		(0.0739)	
(*M*)	*L-Spring*	−0.0551		−0.0893		−0.0276	
		(0.0634)		(0.0938)		(0.0851)	
	L-Summer	0.3846	***	0.3598	***	0.4071	***
		(0.0562)		(0.0877)		(0.0730)	
	Date of Listing (Time)	−0.2451	***	−0.2342	***	−0.2527	***
		(0.0230)		(0.0325)		(0.0326)	
	Date of Listing - Sq	0.0030	***	0.0029	***	0.0031	***
		(0.0004)		(0.0006)		(0.0006)	
Seller Characteristics	*Negotiating Pad (%)*	0.8869	***	1.0452	***	0.7992	***
		(0.1561)		(0.3390)		(0.1945)	
(*O*)	*Negotiating Pad - Sq*	−0.3416		−0.1811		−0.9212	
		(0.4209)		(0.7051)		(0.6581)	
	Eager	0.3538	***	0.3559	***	0.3673	***
		(0.0848)		(0.1176)		(0.1086)	
	Relocated	0.0300		−0.0364		0.0630	
		(0.0885)		(0.1414)		(0.1117)	
	Selling Bonus	0.2412	**	0.1782		0.3275	**
		(0.1072)		(0.1514)		(0.1447)	
	Foreclosure	−0.2135	**	−0.1340		−0.2211	**
		(0.0855)		(0.1447)		(0.1060)	
	Vacant	0.1947	***	0.1762	**	0.1890	***
		(0.0519)		(0.0842)		(0.0667)	
	N	2317		874		1443	
	R^2	0.294		0.315		0.269	
	F	44.7	***	730	***	25.1	***

Significance levels for T-ratios (***, 0.01; **, 0.05; *, 0.10)

have discounts associated with all of the binary seller motivation variables, whereas higher priced houses exhibit discounts only for eager sellers and foreclosures. For all models, as the negotiating pad increases, so do estimated selling prices; however, the quadratic term shows a decreasing rate of increase in expected selling prices.

For the time-on-the-market model, the variables, *Eager, Relocated,* and *Foreclosure* are expected to have negative coefficients reflecting decreased marketing time. The coefficient for *Vacant* is expected to be positive, reflecting reduced marketability, and the coefficient for *Selling Bonus* has an indeterminate expectation because of limited knowledge on why the bonuses were offered. The results show reduced marketing times only for *Foreclosure*, and only for the full sample and the subset of lower priced houses. When significant, the coefficients for *Eager, Selling Bonus,* and *Vacant* are positive. The coefficient for *Relocated* is consistently insignificant. The results for *Negotiating Pad* show that as the seller increases the listing price, the expected marketing time increases as well. The quadratic effect is insignificant.

The implications of the variable, *Eager,* are difficult to interpret because of the uncertainty of whether the "eager" seller is verifiably a motivated seller or merely one taking advantage of an opportunity for better market access. The results bear out this ambiguity. As expected, a seller identified as "eager, anxious, or motivated" sells for a lower price than other sellers not so identified. For the selling price model, the coefficient for *Eager* is significant and negative with a slightly lower magnitude in the lower priced submarkets. However, contrary to expectations, marketing times increase when the MLS listing description identifies the seller in the context of being eager. For the marketing time model, the estimated coefficients are consistently significant and positive with similar magnitudes across submarkets. An explanation for this result is that listing information implying that the seller is eager is valued by the seller as a means of increasing the pool of buyers, and that the seller is willing to accept a discount to attract more buyers. However, eager sellers, given the apparent increases in marketing time, often have houses that are difficult to market. This is borne out by the data, which show 25% of "eager" sellers are selling a vacant house (see Table 2).[10]

The variable, *Relocated,* provides direct evidence of the impact that sellers, in the position of consuming a double allotment of housing, have on the price of housing. A seller that is geographically removed from the listed house, by so stating in the MLS listing description, directly conveys to the market a specific financial motivation to sell the house. The results suggest that relocating owners accept a discount from the selling price, but apparently do not receive benefits arising from a faster sale. The significant and negative coefficient for *Relocated* in the selling price model suggests a discount from the market value similar in magnitude to that of *Eager* (about 2.1%). Lower priced houses show a relocation discount of approximately 2.4%, considerably larger than that associated with eager sellers. The estimated coefficient for higher priced houses and those in the time-on-the-market model are insignificant. Turnbull et al. (1990) find insignificant price effects for corporate-owned properties, representing properties whose owners have been transferred with the employer offering substantial relocation assistance. They do not test for time effects or for properties held by owners that have been transferred without verifiable corporate assistance.

A seller can choose to enhance the compensation package of the selling broker. A seller can offer a bonus either for a faster sale or for meeting a certain price. The positive and sig-

nificant coefficient in the time-on-the-market model (except the higher priced submarket) shows an increase in marketing time such as one would expect for a price-motivated selling bonus. However, the insignificant coefficients in the selling price model suggest that the goal of higher prices is not being attained. Conspicuously, in the market for lower priced homes, the results for *Selling Bonus* suggest a perverse effect: that is, sellers using incentive bonuses sell at a discount and absorb additional costs associated with an increased marketing period. From Table 1, one-third of the selling bonuses are offered by owners of vacant properties, suggesting that selling bonuses, similar to "eager" sellers, are often associated with properties that are difficult to market. The results for both variables support this association with atypical, or otherwise difficult to sell, properties.[11]

A vacant house evidences distress or neglect and is more difficult to market. As a consequence, *Vacant* is a proxy for both seller motivation and poor marketability. As expected, the results for *Vacant* show a price discount and a longer expected marketing time. Estimated price discounts for higher priced houses are approximately half the magnitude of those for lower priced houses. The magnitude of this coefficient is less than that estimated in Turnbull et al. (1990), with no control for seller motivations.[12]

The results for *Foreclosure* are exactly as expected. Foreclosure houses sell at a discount from the estimated value, and they sell more quickly relative to nonforeclosures. The estimated coefficient suggests a foreclosure discount that is much smaller than those observed in previous studies. When the coefficient is estimated without controlling for the other seller motivation effects (binary variables), the implied foreclosure discount increases to 6.69%. When *Negotiating Pad* is also omitted, the estimated foreclosure discount increases to 19.10%, a magnitude that is more comparable to those estimated in previous research. Although the studies are not directly comparable, it is likely that the foreclosure discounts in Rutherford et al. (1992) and Shilling et al. (1990) are overstated, because these studies do not account for seller motivation effects.

The positive and significant coefficients for *Negotiating Pad* reflect the strategic importance to the seller of setting the list price. The negotiating pad is the ratio of the listing price to the property value at the time of listing. A positive negotiating pad indicates overpricing. Because a motivated seller does not seek to decrease the size of the pool of potential buyers, a motivated seller will set a listing price that is closer to, and even less than, the estimated value of the property.[13] A non-motivated seller can choose a larger negotiating pad to take advantage of the variability of offers over time, or a lower negotiating pad to move the property more quickly.

Entirely consistent with expectations, the results show that lower negotiating pads result in lower selling prices and faster sales. The results show that the selling price benefits from setting higher prices begin to diminish at list prices between 1% and 3% below estimated property values at the time of listing. These estimated benefits disappear well beyond the range of the data. The impact of *Negotiating Pad* is emphasized by its effect on other coefficients when it is excluded from the model. When the models are run without *Negotiating Pad,* the discounts for *Eager* and *Relocated* more than double, the discount for vacant houses increases from 2.5% to 6.6%, and the foreclosure discount increases to 15%.

A simple regression using *Negotiating Pad* as the dependent variable with time and seller motivations on the right-hand side shows the coefficients for *Eager, Moved, Foreclosure,* and *Vacant* to be significant and negative. This further confirms the expected association

of seller motivations with smaller negotiation pads. Also, the coefficient for *Selling Bonus* is positive and significant, further suggesting that sellers offer additional compensation for the purpose of increasing selling prices.

3.2. Seller Motivations and Market Efficiency

For the perspective that residential real estate markets are efficient when identical houses sell for the same price (Turnbull et al., 1990), the estimated selling price discounts for vacant and foreclosed houses and houses sold by eager or transferred sellers imply that the real estate market is inefficient. Buyers of these properties potentially earn above-market returns because they can be purchased at a "below-market" price. However, it is risky to conclude solely on the basis that selling price discounts exist that the residential real estate market is inefficient.

Superficially, the existence of identical properties selling at different prices supports the concept of market inefficiency. However, there are several explanations supporting the notion that the observed selling price discounts result from market imperfections that give rise to increased price dispersion across residential properties.[14] First, it is possible that buyers of distressed and motivated properties may comprise a different submarket of buyers, composed of a larger percentage of investors and a smaller percentage of owner/occupiers. Also, given that real estate values are time-dependent (that is, $V = V(t)$), then selling price discounts reflect either the price of securing a faster sale for seller motivated properties, or the price of uncertainty for properties with poor marketability. Finally, in the case of seller motivation, the argument for "single-price efficiency" holds only if the characteristics of the seller are independent of the valuation of the property. Persistent evidence of price discounts resulting from seller motivation support the existence of information imperfections. Buyers that are more information efficient, such as investors, can capitalize on the characteristics of sellers to purchase properties at a discount.

The results strongly support the need for caution in valuing real estate in markets with a high incidence of these types of properties. The implications to assessors and appraisers of understating value because of an inadequate assessment of various discount effects are obvious. Unfortunately, identifications of these properties can be difficult. Distressed properties, such as vacant and foreclosed properties, are readily identified. However, this is not the case for other motivated sellers. Because of the poor information flows, it is likely these properties create a downward pressure on property values because market participants fail to recognize or to account for the price discounts.

3.3. The Impact of Property and Market Characteristics

Hedonic housing price and marketing time models are prevalent in the literature. For the market and physical characteristics, the results from this research are similar enough to those documented in previous research to justify limited discussion. In the selling price model, all the physical property characteristics, H_i, have significant coefficients. Except for the age of

the house, all of the H_i have a positive effect on the selling prices of single-family homes. These results are consistent with many other studies where physical property characteristics tend to dominate the hedonic prices of housing. Of the H_i, *Size* and *Bathrooms* contribute the most to the price of a single-family home. Also, as expected, a house occupied by a tenant sells for less than a house not occupied by a tenant. This is consistent with expectations that, for a tenant-occupied house, immediate occupancy is not as likely and the buyer reduces the amount offered for the house. For the time-on-the-market model, the coefficients for the H_i are mostly insignificant. Bedrooms and the presence of a pool both increase marketing times.

The selling price model shows negative and significant coefficients for all season variables. This result suggests that the omitted season, *Winter,* is associated with higher housing prices.[15] The coefficient estimates show that the lowest prices occur in the *Fall.* The coefficient for *Date of Sale* suggests that selling prices were increasing over the study period. It is likely that the seasonal effects on selling prices are aberrations resulting from data drawn from a steadily improving local real estate market. For the time-on-the-market model, the results for the season coefficients are as expected. Marketing times are significantly longer in the *Fall* and significantly shorter in *Spring* and *Summer.* The significant and negative coefficient for *Date of Listing* shows that marketing times are decreasing over the study period.

Finally, the selling price model suggests that selling prices decrease with time on the market. Although this result conflicts with search theory and is possibly an aberration of the data, several other papers (see Asabere and Huffman, 1993; Turnbull et al., 1990; among others), using data from differing markets over differing periods, find similar results. The impact of the time-on-the-market variable is approximately a 0.03% reduction in price for each day on the market.

4. Conclusions

The motivations of the individual seller affect the marketing times and selling prices of single-family housing. This article presents models that measure the selling price and time-on-the-market effects of seller motivations. Price discounts are noted for eager sellers, relocated sellers, foreclosure houses, and vacant houses. Faster marketing times are only noted for foreclosure properties. Other seller motivation variables in the marketing time model, showing either positive and significant or insignificant coefficients, further support the premise that sellers influence selling prices but not the time on the market. The estimated discounts for vacant and foreclosure houses are smaller than those of previous studies that do not control for seller motivations.

The implications of these results are twofold. First, the existence of motivated sellers offers opportunities to purchase single-family housing at reduced prices. To capitalize on the market imperfections resulting from seller motivations, a buyer must identify these properties on a timely basis with the information at hand. The information identifying these properties varies as to quantity, quality, and accessibility. Finally, the market for properties of motivated sellers is a buyer's market. Thus the buyer has a better negotiating position.

The results provide evidence that the seller concedes on selling price, but only effectively reduces the marketing time by reducing the list price.

Many opportunities exist for further research in this area. Refinement in the identification of motivated sellers will lead to a better understanding of their impact on the real estate markets. The geographic and contemporaneous stability of selling price discounts has not been explored. Finally, empirical inquiry can be extended to other residential markets, such as condominiums, and to commercial real estate.

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Notes

1. Search and information theory provides a theoretical foundation. See Lippman and McCall (1976) for a general treatment.
2. This argument is simplified to the extent that other components of the homeowner's welfare are excluded. Legitimately, the seller seeks to maximize consumer welfare. The seller's equity is a determinant of the final wealth position (see Genesove and Mayer, 1994). The transaction price is a determinant of the seller's realized equity. Also, the seller receives benefits from the house during the marketing period. Many aspects of the total consumer welfare package can be summarized by including them in C.
3. It is argued that sellers are not willing to release information about their reasons for selling the property (Glower et al., 1994). While this is generally correct, note that sellers do not have to accept unacceptable offers that result form market knowledge of any motivations. Also, despite the potential agency problems, the MLS system provides considerable information that suggests seller motivations; it is inevitable that this information penetrates the market. However, the degree of penetration is not known. While the voluntary information can result in unacceptable offers, the increase in the frequency of offers resulting from the release of information is a large potential benefit.
4. The complete data set consists of 4,113 observations. The set of 3,260 observations results from deletion of 848 incomplete or unusable observations.
5. Unsuccessful transactions are inevitable and unreported in the data. A collapsed deal adds nonquality time to the marketing period. Also, the data are right censored; that is, only houses that have been sold are reported.
6. Ideally, the expected time on the market is used in a model estimating expected selling prices. Generally, a two-stage model is used, where stage one estimates time-on-the-market, which becomes an input to stage two, which estimates selling price. In this paper, the expected marketing times and selling prices are estimated independently. The gain is a reduction of complexity, by not having an additional variable (one being *Negotiating Pad*) that is estimated from the data, at the sacrifice of the "best specification." The time on the market is included in the selling price model to control for the impact of differing marketing times on the selling prices in the data.
7. A held-back sample of 829 observations is selected by a systematic process based on the MLS property code number, which is basically an inventory control number. Although systematic, the sample selection process is unbiased, because the MLS property identification number is not correlated with any property features. A total of 324 of the observations, characterized as motivated sellers, were deleted from the held-back sample and also not included in the final sample. The model used to estimate the expected selling prices specifies the log of the selling price as a function of the previously described property and market characteristics, H_i

and M_i. The results show an R^2 of 0.819 with 8 of 15 variables significant at the 1% level. The F-value was highly significant. Because the model is required only for predicted values, no heteroskedasticity correction is performed. This affects the number of significant coefficients.

8. The index was created from the monthly median prices of houses sold in Arlington as reported by the Arlington Multiple Listing Service.
9. Before the removal of outliers, the percentage prediction error had a mean value of 0.122 with a standard deviation of 0.617 for 2,756 observations. After removal of outliers, the mean is 0.064 with a standard deviation of 0.225. For the estimated negotiating pad, the mean is reduced from 0.082 to 0.074, and the standard deviation is reduced from 0.278 to 0.207.
10. If *Vacant* is dropped from the model or if observations of vacant houses are deleted from the sample, the results for *Eager* persist. Thus, if longer marketing times are a result of difficult-to-market houses, there are sources of poor marketability other than those captured by the data.
11. When *Vacant* is removed from the model, the results are similar. However, when observations of vacant houses are dropped from the sample, the coefficients for *Selling Bonus* are insignificant in both models. Effective evaluation of selling bonuses clearly require a more refined data set.
12. When *Eager, Relocated,* and *Selling Bonus* are omitted from the model, the results are similar. When *Foreclosure* is omitted, as well, the vacancy discount is slightly larger and the expected time on the market for vacant houses decreases.
13. Because of prediction error, *Negotiating Pad* has a large variance. Although many outliers were deleted, there remain many observations that show underpricing. In all, for 63% of the observations, estimations of *Negotiating Pad* show overpricing, 10% suggest underpricing by less than 5%, and 8% show underpricing between 5% and 10%. The remaining 19% of the sample, showing underpricing greater than 10%, consists of 49% vacant houses and 58% motivated sellers. It is likely that many of the underpriced properties are below average in condition. A dummy variable represented underpriced houses does not significantly alter the results when included in the models.
14. Quan and Quigley (1991) discuss the information content of prices and the role of incomplete information in the determination of transaction prices.
15. Expectations are for higher prices in the spring corresponding to a stronger market. Experimentation with the model reveals that of the four seasons, using different combinations, only the coefficients for *Fall* and *Winter* are consistent. The coefficients for *Spring* and *Summer* depend on the particular combination of seasons included in the model.

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