What Do Real Estate Brokers Do: An Examination of Excess Returns in the Housing Market*

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Abstract:

This paper explores the effect of real estate brokerage-firm and agent characteristics on the prices received by home sellers. It develops a model for assessing the impact of firm and agent characteristics on the prices received by sellers in a multiple listing service (MLS). Empirical estimates of the model reveal no evidence that some brokers are able to obtain higher prices for the homes they sell than are others. This finding is consistent with the idea of an efficient information flow in the MLS market, where firms and individuals do not possess special advantages because information is shared within the MLS among agents, firms, sellers, and buyers.

Article:

I. INTRODUCTION

In recent years, there has been growing academic interest in the workings of the residential brokerage industry.[1] Researchers have examined the question of how the price of housing is affected when a home owner sells through a real estate broker in preference to sale by owner. Several empirical studies (Doiron et al., 1985, and Jud and Frew, 1986) have found evidence that brokers obtain higher sales prices, enabling a typical seller to pass some part of the commission on to the buyer. Other studies by Kamath and Yantek (1982) and Colwell et al. (1992) have reported that brokers do not influence selling prices. A theoretical analysis by Salant (1991) has shown the effect of brokers on listing prices to be indeterminate.

Another set of studies (Crellin et al., 1988; Follain et al., 1987; and Glower and Hendershott, 1988) has examined the determinants of real estate agent incomes. Drawing on human capital theory developed by Becker (1975) and others, these studies have reported that agent income is directly related to (1) the possession of a broker's license, (2) the number of hours worked per week, (3) the level of schooling completed, (4) years of experience, and (5) the level of professional training.

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[1] See, for example, Federal Trade Commission (1983) and the *J. Real Estate Res.* 3(2) (1988) special issue on real estate brokerage.

The impact of franchise affiliation on brokerage performance and consumer perception also has been examined. Studies by Frew and Jud (1986) and Jud et al. (1994) have reported that franchise affiliation increases the earnings of brokerage firms. Research by Colwell and Marshall (1986) reported results that were mixed: franchise affiliation significantly increased home sales in 1980, but not in 1981. Other work by Nelson and Nelson (1988) has found that national franchise affiliation positively affects consumer perceptions of brokerage firms. Research by Johnson et al. (1988) reported that consumers believe that brokerage service quality is related to factors such as service quality assurances, firm characteristics, and service empathy.

The purpose of this paper is to examine further the factors that influence the performance of residential real estate firms and their agents. The paper differs from past work in that it looks at the effect of firm and agent characteristics on selling prices within a multiple listing service (MLS). Unlike past research which has focused on differences between brokered sales and sales by owners, this paper looks at possible differences within an MLS. The paper is concerned with the issue of whether there are significant differences among agents that enable some to sell homes at higher prices than others. From the perspective of the home seller, the issue is whether there are significant gains to listing with some agents in preference to others. The first section of the paper develops an analytical model to assess agent performance. The second section presents empirical estimates of the model drawn from the MLS in Greensboro, NC. The final section summarizes relevant findings.

II. REAL ESTATE AGENTS AND HOUSING PRICES

When selecting a real estate agent to sell a home, a seller presumably chooses the agent that the seller believes will sell the home at the highest price in the shortest possible time. The question in which we are interested is whether the seller's choice of a real estate agent makes any difference to selling price or time on the market (TOM). The answer to the question hinges on the character of the housing market. If information is widely disseminated among agents, then no agent is likely to possess special advantage. A parallel might be drawn with the securities market: Does it make any difference which stock broker sells a stock? Clearly, in the securities market, information is so rapidly and widely available that no broker or firm normally is able to command a price premium. However, in the residential brokerage industry, the situation is less certain because market information is not so quickly or widely spread. At least, most brokers try to represent themselves as having special abilities and knowledge that enable them to sell a home more quickly and at a higher price than their rivals.

Assume for the moment that all houses sold within an MLS are the same. The market price (P) of the average home is given by

$$P = a_0 + a_1 * \ln(\mathrm{TOM}) + A*Z + u_p, \qquad (1)$$

where TOM is time on the market and Z is a vector of firm and agent characteristics. It is expected that $a_1 > 0$, because increasing TOM raises the probability of finding a buyer willing to pay a higher price. The natural log of TOM is used to allow the gains in price associated with longer TOM to rise at a decreasing rate.[2]

[2] Miller (1978) shows that selling price and TOM are positively related.

Likewise, TOM is given by

$$\ln(\text{TOM}) = b_0 + b_1 * P + B*Z + u_1. \qquad (2)$$

It is expected that $b_1 > 0$ and $B < 0$.

The reduced form equation of this simultaneous system is found by substituting Eq. (2) into Eq. (1), yielding

$$P = (a_0 + a_1 b_0)/(1 - a_1 b_1) + [(A - a_1 B)/(1 - a_1 b_1)+*Z + e_p. \quad (3)$$

Equation (3) can be simplified to

$$P = c_0 + C*Z + e_p. \qquad (4)$$

The null hypothesis of the study is H_o: C = 0, that is, there are no significant differences among firms or agents in the prices they obtain for the houses they sell.[3]

Recognizing that all houses are not the same, but rather can be represented as varying bundles of different characteristics, changes the housing price equation. Equation (4) becomes

$$P = c_0 + C*Z + H*X + e_p, \qquad (5)$$

where X is a vector of housing and neighborhood characteristics, including the time of sale.

We define a home's "expected" market value $(\hat{P})$ to be the value predicted by an hedonic equation, which is estimated by the regression of selling price (P) on the vector X:

$$\hat{P} = H*X \qquad (6)$$

Substituting Eq. (5) into Eq. (4) gives

[3] In terms of the structural equations, a finding that $C = 0$ is consistent with either A = B = 0 or $A = —a_1 B$. In the first instance, agents and firms have no special influence on price (A = 0) and TOM (B = 0). In the second case, the higher price resulting from a shift in Eq. (1) is offset by the lower TOM caused by a shift in Eq. (2). In this second case, the implication is that while some agents or firms produce a lower TOM, there is no influence on price. Because our model is not able to identify the structural equations, we can not distinguish the two alternatives. Thus, our results test only price effects. Nevertheless, price effects are important. A survey undertaken by the Federal Trade Commission (1983) revealed that 85.9% of home sellers felt that "obtaining the highest sales price" was an important factor in picking a brokerage firm.

$$P^{E} = c_0 + C^{*}Z + e_p, \qquad (7)$$

where $P^{E} = P - \hat{P}$.[4]

If all prices in the foregoing equations are expressed in natural logarithms, the dependent variable (P^{E}) in Eq. (6) may be interpreted as a percentage excess return above the predicted market price. The basic question of the study, therefore, may be formulated as: Are there excess returns attributable to particular brokerage firms or agents?[5]

III. SAMPLE DATA

The question of excess returns in the residential real estate market is tested with data from the Greensboro Regional REALTORS Association (Greensboro, NC) for the period starting September 1991 and ending in 4 September 1993. A total of 4183 housing transactions formed the initial data set; however, missing data and incorrect codings reduced the size of the sample. The final data set consists of 2630 dates, prices, property descriptions, and characteristics of houses sold through the MLS. The homes in the sample represent sales by 111 different brokerage firms involving more than 600 individual real estate agents.

The operational model is defined as

$$P_i^{E} = C_0 + C_1{}^{*}P_i^{L} + C_2{}^{*}N_i^{L} + C_3{}^{*}N_i^{S} + C_4{}^{*}\Delta P_i^{L} + C_5{}^{*}I_i + C_6{}^{*}\mathrm{ST}_i^{S} + C_7{}^{*}\mathrm{ST}_i^{L} + e_i, \qquad (8$$

where

P_i^{E}	The excess rate of return as defined previously;
P_i^{L}	The natural logarithm of the list price;
N_i^{L}	The natural logarithm of the total number of home sales for the agent listing home i;
N_i^{S}	The natural logarithm of the total number of home sales for the agent selling home i;
ΔP_i^{L}	The natural logarithm of the original list price minus the natural logarithm of the final list price;
I_i	A dummy variable for identical listing and selling offices for home sale i;
ST_i^{S}	A shift parameter for each selling office;
ST_i^{L}	A shift parameter for each listing office.

[4] The two-stage approach adopted here is derived from the traditional econometric methodology for residual analysis (see Neter and Wasserman (1974), pp. 109-111). This approach also is in the tradition of a large body of financial market research that has focused on explaining patterns of excess market returns (see Ruback (1982), Mikkelson and Ruback (1985), and Asquith and Mullins (1986)). The methodology also allows us to minimize potential problems of multicollinearity that may arise because of market segmentation in the brokerage industry. Such segmentation may result in particular firms or agents being correlated with specific housing characteristics. By focusing on excess market returns, we are able to minimize the potential contaminating effects of such collinearity.

[5] We are concerned with percentage excess returns rather than the magnitude of absolute excess returns. This formulation of the dependent variable eliminates potential scale effects that could arise in comparing return patterns between low- and high-valued homes.

The excess return, P_i^E, reflects the difference between the log of the actual selling price and the log of the predicted price from the hedonic regression equation capturing housing and neighborhood characteristics. The hedonic model coefficients used to estimate the predicted prices are shown in the Appendix.

Including the listing price (P^L) and change in listing price (ΔP^L) variables in Eq. (8) provides a test of the marketing strategy employed by the listing agent and the home seller. An important determinant of excess return is the list price (P^L) of a home. Higher priced homes can be expected to be associated with greater atypicality.[6] The variation in offer prices is likely to be greater for more expensive homes. This is because the actual value of higher priced homes is more difficult to precisely assess due to greater dissimilarities with other homes on the market. Given a seller's time frame for selling a house, a greater price variation works to the advantage of the seller because it increases the probability of obtaining an offer at or above the seller's threshold price.[7] Accordingly, we anticipate a positive relation between the listing price and the excess return. Additional support of including the list price in Eq. (8) is found in Horowitz (1992).

Repricing signals also may affect the seller's excess return. When changing the list price of a home, does the seller send a new signal to market participants about the seller's threshold price, or alternatively, does the relisting constitute a marketing artifice? If a seller's threshold price is reduced, the seller's excess return should decline. Conversely, if the relisting does not change the seller's threshold acceptance level, the excess return should not change. The relisting effect (ΔP^L) is measured as the difference between the log of the original list price and the log of the final list price, or the percentage change in the list price.

The independent variables also capture the effects of firm and agent characteristics and expertise. The shift parameters for the selling and listing offices capture differences in organizational efficiencies such as reputation, franchising, and firm-specific advertising or selling techniques that may enable the selling or listing firm to extract a higher excess return for the seller. In an efficient market, where information is conveyed rapidly and is widely disseminated among market participants, no firm is able to extract an excess return for the seller through a listing or selling agent's special knowledge or abilities. Although a multiple listing service does help make the residential real estate market more efficient, the market for residential real estate is still not expected to be as informationally efficient as the markets for selling equity and debt securities. The existence of statistically significant shift parameters for listing (STL) and selling (STS) firms supports the argument that some firms have special abilities and knowledge that result in excess returns for their clients.

One might suspect the possibility of a selectivity bias in the analysis because buyers and sellers are not randomly assigned to real estate firms, but actively pick their brokers. If brokers are

[6] Haurin (1988) has shown that houses with higher listing prices tend to be more atypical.

[7] On this point, see Haurin (1988). A seller's threshold price (the price the seller is willing to accept) is assumed to *be* less than or equal to the list price. Although the list price does not legally constitute an offer price, a seller who refuses to sell at the list price may face the substantial penalty of having to pay a commission to the broker even though the property is not sold (Dasso and Ring (1989), p. 122). Because of this penalty, most sellers are reluctant to decline an offer at the list price.

chosen by buyers and sellers, then price differentials could potentially result from the differences among buyers and sellers, not from differences in broker productivity. Were this to be the case, one would expect to find that house prices vary among different groups of home buyers. This question has been examined recently by Turnbull and Sirmans (1993). Using MLS data from Baton Rouge, LA, they report no significant differences in housing prices across various groups of buyers. The results of Turnbull and Sirmans (1993) indicate that whatever price differentials prevail in the market, they are not associated with identifiable characteristics of home buyers and sellers.

Another issue related to market efficiency is the question of whether having the identical listing and selling firm involved in a transaction creates an excess return for the seller.[8] In a transaction where the selling and listing firms are identical, there is the prospect that the buyer is at a disadvantage. Because the seller's listing firm negotiates both ends of the deal, the seller may obtain some enhanced bargaining power relative to the buyer. An independent variable (I) captures if the listing and selling firm are the same for a home sale transaction (I 1 if same, 0 otherwise).[9]

Although we address the possibility that specialized abilities and knowledge may exist at the firm level through the use of the shift variables (ST^L and ST^S), individual agents also may possess special advantages. Such advantages could occur because of numerous factors including work experience, training, and other resources.[10] Although these factors contribute to agent productivity, the many and varied nature of these variables makes measurement difficult. We focus on the outcome of these measures which is the number of sales consummated for the listing (N^L) and selling agents (N^s).[11] Conventional wisdom suggests that listing agents who have sold many homes help the seller extract a higher return. However, a converse argument could be made: Successful listing agents may achieve high sales by prompting their clients to accept lower offer prices in their efforts to close (see Salant (1991)). From the selling agent's perspective, a successful selling agent may be one who persuades the buyer to offer a higher "bid" price. Therefore, an experienced selling agent offering guidance to the buyer might result in a larger excess return to the seller.

Table I shows the descriptive statistics for the variables in the regression model. Applying the antilogarithm to the maximum number of sales, the listing agent and selling agent maximum values are 39 and 72, respectively. The minimum is one home sale for listing and selling agents.

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[8] For discussion and evidence of the perceptions of consumers and agents involved in this kind of transaction, see Ball and Nourse (1988). An excellent discussion of the legal issues in this type of relationship can be found in Marsh and Zumpano (1988). In our sample of MLS sales in Greensboro, NC, the listing and selling agents were the same in 33% of the transactions.

[9] One might suspect that there also is a correlation between 1 and TOM. In our sample, we find that I and TOM have a statistically significant negative correlation. As pointed out in Footnote 3, when there is a shift in *one* of the structural equations (Eq. (1) or (2)), one is likely to observe both price and TOM effects. *Because* we have focused on price effects, we do not explore this issue. For other studies that have examined the relationship between TOM and *I, see* Frew (1987) and Sirmans *et a!.* (1991).

[10] For analysis of the determinants of REALTOR productivity and earnings, see Crellin *et al.* (1988) and Glower and Hendershott (1988).

[11] Given the number of agents in the study, the use of dummy variables for individual agents is not feasible. The number of dummy variables is too large, and collinearity with the structural variables for the firm exists.

IV. EMPIRICAL FINDINGS

Table II reports the ordinary least-squares (OLS) and fixed-effects regression results. The fixed-effects model includes the dummy variables for individual listing and selling offices (ST^L and ST^S). Both regression equations are significant at the 0.01 level. For the fixed effects model, we conducted a joint test of restricted versus unrestricted models for the selling and listing office dummy variables. The Chow tests yield F values of 0.70 and 0.78 for the selling and listing structural variables, respectively, which are not statistically significant at the 0.05 level. This finding is consistent with the conclusion that listing and selling offices do not possess special abilities and knowledge that enable them to sell similar homes at higher prices than their rivals. From another point of view, this finding is consistent with an efficient residential real estate market, where individual firms do not possess special advantages because information is shared among agents and firms through the MLS.

As anticipated, the list price (P^L) is highly significant in explaining the excess returns. Interpreting this coefficient, a 1% rise in the list price results in a 0.12% increase in the excess return. Therefore, more expensive homes appear to offer higher excess returns for the seller. This result is consistent with the argument that more expensive homes are more atypical, which increases the variation of offer prices and enables the seller to have a higher acceptance threshold given a target time on the market.

TABLE I
Sample Descriptive Statistics (n = 2630)

Variable	Mean	Standard deviation	Minimum	Maximum
P^E	0.1269	0.1678	−1.7613	1.4220
P^L	11.7039	0.5232	10.2750	13.7902
N^L	2.0693	0.9605	0	3.6636
N^S	2.4032	0.8558	0	4.2767
ΔP^L	−0.0188	0.0436	−0.4840	0.1823
I	0.3266	0.4691	0	1

TABLE II
Excess Return Regression Results

Variable	OLS coefficient (t value)	Fixed effects coefficient[a] (t value)
Constant	−1.2713	−1.2504
	(−18.88)*	(−12.64)*
P^L	0.1205	0.1207
	(20.60)*	(14.93)*
N^L	−0.0057	−0.0074
	(−1.79)***	(−1.38)
N^S	0.0022	0.0043
	(0.63)	(0.60)
ΔP^L	0.6387	0.6472
	(9.32)*	(7.78)*
I	0.0193	0.0147
	(3.02)*	(1.82)***
F value	107.22*	2.74*
Adjusted R^2	0.17	0.23
n	2630	2006

[a] Although the regression coefficients for the listing and sales offices are not shown in Table II, these variables are included in the estimated regression equation. The number of observations is somewhat lower than the OLS model because observations were lost due to missing listing and selling offices.

* Significant at the 0.01 level.
** Significant at the 0.05 level.
*** Significant at the 0.10 level.

The coefficients for the number of sales for both listing and selling agents (N^L and N^s) are not statistically significant for the fixed-effects regression, and the number of sales for the listing agent has a marginally significant negative coefficient under OLS. Consequently, individual agent abilities and knowledge do not appear to produce excess returns for the seller. These findings also are consistent with an efficient market for residential real estate.

Although the findings in Table H do not support the importance of firm and agent qualities in generating positive excess return for the seller, having the same listing and selling firm does seem to influence the seller's excess return. Looking at the fixed-effects regression, the coefficient on the dummy variable (I), which shows the effect on returns when the selling and listing office are the same, is 0.0147. The percentage increase in excess returns associated with having the same the selling and listing office is $100*(e^{0.0147}-1)$, or 1.5%. This finding suggests that the selling agent may try harder to extract a higher price from the buyer when both the selling and listing agents are employed in the same brokerage firm.[12]

The list price change variable (ΔP^L) shows a strong presence in the regressions, indicating that a change in the list price sends a pricing signal to the marketplace and is more than a marketing gimmick. Table II reports a positive coefficient of 0.65 under the fixed-effects model, which is statistically significant at 0.01. Therefore, a 1% change in the original list price results in an

[12] Frew (1987) and Frew *et al. (1993)* offer theory and evidence that larger brokerage firms are more likely to sell their own listings.

average 0.65% change in the seller's excess return. Although this relation is inelastic, closing prices clearly are influenced by listing repricing. Reducing the listed price of a home appears to send a strong signal that the reservation price of the seller has been lowered.

V. CONCLUSIONS AND IMPLICATIONS

This paper explores the effect of real estate brokerage firm and agent characteristics on the prices received by home sellers in a multiple listing service. The study finds no evidence that some brokers are able to obtain higher prices for the homes they sell than are others. This finding is consistent with the idea of efficient information flow in the MLS market, where firms and individuals do not possess special advantages since information within the MLS is shared among agents and firms. Our results are consistent with the study by Turnbull and Sirmans which reported that prices do not vary among home buyers.

Our findings raise the issue of why there is not more direct price competition among firms within an MLS? If sellers were to understand that all firms in an MLS are the same, that is, no one is able to command a higher price for the seller than another, then sellers would seem to be drawn to the lowest price firms. The fact that price competition is not widely observed suggests that most sellers do not believe that all firms are the same. This apparent misinformation in the perceptions of home sellers is a subject that warrants substantial additional research.

The study finds strong evidence that pricing signals in terms of list price and changes in the listed price are very important in the residential market. Repricing a listed house appears to send a strong signal to market participants about the seller's minimum reservation price. Lowering the listed price sends the signal that the home seller's reservation price has been reduced.

Last, our study reveals that home sellers obtain higher prices when the listing agent is also the selling agent. In transactions where the listing and selling firms are the same, seller excess returns appear to be 1.5 to 1.9% higher, suggesting that buyers are at a bargaining disadvantage.

APPENDIX

TABLE AI
Regression to Estimate Predicted Residential House Prices[a]

Variable	Coefficient	t value
Intercept	10.3244	26.65*
Age	−0.0016	−3.56*
Baths	0.2215	15.81*
Square feet	0.0002	21.30*
Garage (number)	0.1141	14.78*
Fireplace (number)	0.1163	9.84*
Attic fan	−0.0012	−0.01
Central air conditioning	0.0551	2.17**
Groundwater heatpump	0.7591	1.97**
Heatpump	0.0174	0.53
Multizoned heating/cooling	0.0956	0.73
Wall unit	0.0509	0.39
None	−0.2436	−5.27*
Not available	−0.2494	−6.37*
Pool	0.1670	7.52*
Adjusted R^2	0.62	
F value	64.37	
n	4183	

[a] Although not reported in the Table AI, dummy variables are included in the regression for location (zip code), year, and month. A Chow test of the location dummy variables results in an F value of 2.86, which is statistically significant at the 0.01 level. The Chow test F values for year and month dummy variables are 0.24 and 1.55, respectively, which are not statistically significant at the 0.05 level.

* Significant at the 0.01 level.

** Significant at the 0.05 level.

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