

Leading Residential Real Estate Sales Agents and Market Performance

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Abstract. This paper reports the results of an empirical study conducted to determine whether leading residential real estate agents, as a group, follow various pricing and/or selling strategies that may enhance the amount of commissions generated. The results indicate that some of the success enjoyed by leading agents is attributable to the fact that they deal in higher value properties compared to other agents. However, controlling for differences in property characteristics and other factors, no other significant strategic differences are discovered between leading agents and others.

Introduction

Each year some residential real estate agents distinguish themselves by superior performance. Many list and/or sell properties with a combined value of millions of dollars. Their success is probably due to some combination of a number of personal characteristics, including, but not necessarily limited to: extraordinary effort, good time management, superior organizational skills, superior knowledge of the market, professionalism, and good personal communication skills. Studies by Johnson, Dotson and Dunlap [10], and Johnson, Nourse and Day [9] show that brokerage customers value these, and other, characteristics in an agent. It is impossible, however, to measure these characteristics using market data, and survey information collected from practitioners regarding such information is subject to bias. To work around this problem, previous studies have evaluated agent performance using the human capital theory. This theory suggests that one's earnings are positively related to factors such as: one's formal education, experience, and effort. The factors employed in these models serve, to some extent, as proxies for the personal characteristics mentioned above. Although a number of significant human capital factors have been identified, a good deal of the variation in agent performance remains unexplained.

This paper reports the results of an empirical study that investigates whether leading residential real estate agents in the Dayton, Ohio area follow particular pricing and selling strategies that may enhance their success. Real estate agent performance is undoubtedly influenced by both the agent's personal characteristics and human capital variables, but unlike personal characteristics mentioned above, the strategies examined in this paper may be empirically tested using market data.

Our paper continues with five sections. In the next section, we present a brief review of the literature concerning the application of the human capital theory to real estate

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agent performance. In the second section, we review the pricing and selling strategies to be tested. In the third section, the data is discussed. In the fourth section, the methodology and results are presented. A summary concludes the paper.

Real Estate Agent Performance and the Human Capital Theory

A number of studies have attempted to explain variations in residential real estate agent income by examining firm and industry characteristics together with various human capital variables. The results of these studies are mixed. Follain, Lutes and Meier (FLM) [5], Crellin, Frew and Jud (CFJ) [3], and Glower and Hendershott (GH) [6], found educational levels to be positively related to performance, but Abelson, Kacmar and Jackofsky (AKJ) [1] found no significant relationship. GH also found that the agent's age was positively related to performance, but both CFJ, and FLM concluded that it was not. This inconsistency prompted AKJ to examine simultaneously both the agent's age, and the age at which the agent started in real estate. Neither was found to be related to performance. Three different measures of experience have been examined in recent research: the agent's tenure at the firm, the agent's tenure in real estate, and the agent's tenure in sales other than real estate. Only AKJ examined these simultaneously, finding only the first to be positively related to performance.

The effect of the agent's marital status, gender, and the agent's willingness to work have also been the subject of previous research. AKJ found that female residential agents tend to be high performers.¹ Marital status has been examined by FLM and AKJ; with the former finding no relationship to performance, and the latter finding a positive relationship. Consistent with the human capital theory, CFJ, FLM, and AKJ all find that agents willing to work the longest are the most successful. FLM and GH both suggest, however, that there may be decreasing returns to hours worked per week.

A substantial portion of the variation in real estate agent earnings remains unexplained in these studies. The highest adjusted r^2 reported in any was 0.59 reported by GH. Unlike the case where estimators are used to predict the value of an observation outside the initial sample, a low r^2 is not critical when the model is used solely to analyze the relationship between the dependent and independent variables. However, the low r^2 s do suggest that something is missing from previous models, and they prompted this research.

Perhaps the variables used in previous research fail to capture personal traits such as the agent's motivation level, knowledge of the market, time management, and organizational or personal communication skills. Alternatively, some of the unexplained variation in income may be attributable simply to good luck. To the extent that this is true, improvements to existing models will be difficult. Regardless, the factors included in previous research do not capture the strategies that are the subject of this paper.

Commission-Enhancing Strategies

When success is based on the amount of commissions generated by the agent, a number of strategies could be employed by agents to enhance their probability of success. To illustrate one such strategy, consider two equally qualified agents, each of

whom sells the same number of properties and secures the same number of listings which are eventually sold. The agent concentrating on higher value properties will be deemed more successful than his counterpart.

A second strategy that may enhance an agent's earnings would be to concentrate effort on properties that are likely to sell quickly. This could be accomplished at two different stages of the sales process; at the time of listing, and during the sales effort. By negotiating a low list price with the seller, an agent will increase the probability that the property will sell.² Setting the list price too low, however, is not in the best interest of the seller, and because successful agents get many of their listings via referrals from satisfied customers, such a strategy may not be in the best long-range interest of the agent either.³ Likewise, agents could concentrate selling effort on properties that are more likely to sell because they were priced (by any agent) attractively low.

It is not clear, however, that listing properties low will necessarily result in higher overall commissions due to greater sales frequency. Leading agents may price properties higher than others. In an empirical study of the Canadian housing market, Janssen and Jobson [8] found that the choice of real estate agent does effect both the listing price and selling price. Their results indicate that agents who list comparable properties for higher prices tend to realize significantly higher selling prices.⁴

Finally, the commissions an agent generates may increase with the seller's willingness to accept discounts from the list price. Agents may offer an opinion regarding the acceptance of an offer, and some may be more aggressive than others in attempting to close the sale. An agent who is successful in convincing sellers to accept marginal offers would be following a strategy analogous to "churning" accounts in the securities brokerage industry.

The preceding paragraphs suggest several questions. To determine if leading agents' superior performance can be explained by these strategies, the following null hypotheses are tested.

- H₀: Leading agents deal in properties with the same value as non-leading agents.
- H₀: Ceteris paribus, leading agents list properties at the same price as non-leading agents.
- H₀: Ceteris paribus, leading agents sell properties that are listed just as attractively (list price compared to predicted price) as non-leading agents.
- H₀: Ceteris paribus, leading agents secure the same percentage of list price as non-leading agents.

Data

The data for this study was secured from the Dayton, Ohio Multiple Listing Service (MLS), and from the area's top residential agents. These agents were identified in a contest sponsored by the Dayton Area Board of Realtors. The Board classified agents into three categories: the top agent, the top ten agents, and the top one hundred agents. The classification was based on the total amount of commissions the agent brought into his or her office between October 1, 1987 and September 30, 1988. The rank of individual agents was not given in the latter two categories. Our study focuses on the market performance of the top ten agents (leading agents).

Exhibit 1 Summary of Property Characteristics

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
Selling price	113,045	62,510	29,000	495,000
List price	116,606	65,854	27,900	495,000
Living space (sq. ft.)	1,564	603	650	3,760
Lot size (1000 sq. ft.)	29.3	170.1	4.4	2,910
Bedrooms	3.35	0.62	2	5
Bathrooms	2.14	0.75	1	5
Age of house (years)	25.8	18.5	1	89
Garage (car spaces)	1.84	0.59	0	4

The study does not include all transactions in which the leading agents were involved for two reasons. First, at the time the data was gathered, information was no longer available on the MLS computer for some transactions. Second, to facilitate the comparison of leading and non-leading agents' performance, the study sample is restricted to transactions involving single-family detached homes.⁵

The sample consists of 298 single-family home transfers; of these, the leading agents listed 196, and sold 90. Each property fell into one of four categories as follows:

- | | |
|---|-----|
| (1) listed and sold by a leading agent, | 28 |
| (2) listed by a leading agent, sold by a non-leading agent, | 168 |
| (3) listed and sold by a non-leading agent, | 40 |
| (4) listed by a non-leading agent, sold by a leading agent, | 62 |

Three firms (Top 3) employed all ten of the leading agents (five agents were employed by one, four by another, and one by the third). To control for effects that may be due to listing brokerage firm size as suggested by Frew [4], and demonstrated by Haurin [7], as well as Larsen and Park [11], additional restrictions were placed on the data. All properties in category (3) were listed either by a non-top one hundred agent employed by a Top 3 firm, or by a Top 3 owner/broker (who were not eligible for the contest). This scientific selection was done to minimize the "firm effect". With only a few exceptions this is also true for properties in category (4). Category (4) exceptions include properties listed either by an agent of a non-Top 3 firm, a top one hundred agent employed by a Top 3 firm, or by either a Top 3 or non-Top 3 non-eligible broker/owner, and were included in the study because the property was sold by a leading agent. All of the Top 3 firms would be classified as "large" in the Frew sense. The restrictions placed on the data also help eliminate selling price differentials due to locational differences, as all Top 3 firms tend to concentrate their activities in the same portion of the greater metropolitan area.⁶ A summary of the property characteristics is shown in Exhibit 1.

Methodology and Results

Recall that the first null hypothesis was: leading agents deal in properties with the same value as non-leading agents. No formal test was required to reject this hypothesis when the leading agents are compared to all agents in the Dayton area. The average

selling price of properties sold during the study period was \$73,977, while the average selling price of properties in which a leading agent was involved was \$114,117. A more meaningful comparison, however, is between the leading agents and other agents working the same areas as the leading agents. To formally test the first hypothesis, a single sample test for differences in mean selling prices was conducted. The population parameter was \$113,045 and the variance of selling price for homes in which leading agents were involved was \$250.03. The test-statistic of 68.85 far exceeds the critical t -value of 2.576 (with $\alpha=0.005$ and infinite degrees of freedom). This result indicates that the first null hypothesis should be rejected. In essence, leading agents deal in higher value homes.

In order to test null hypotheses 2 through 4, we develop the predicted selling price; a measure that controls for differences in: property characteristics, time on market, type of financing used, listing firm, and the season in which the property was listed. For this objective, the following log transformed equation was used after it was determined that the data best fit a semilog form.

$$\begin{aligned} LGSP = & \beta_0 + \beta_1 LGSQFT + \beta_2 LGAGE + \beta_3 LGLOT + \beta_4 LGDOM + \beta_5 FIN \\ & + \beta_6 AIR + \beta_7 BASE + \beta_8 BRICK + \sum_{i=9}^{11} \beta_i FIRE + \sum_{i=12}^{14} \beta_i BED \\ & + \sum_{i=15}^{19} \beta_i BATH + \sum_{i=20}^{22} \beta_i GAR + \sum_{i=23}^{25} \beta_i SEASON \\ & + \sum_{i=26}^{28} \beta_i FIRM + \epsilon, \end{aligned} \quad (1)$$

where:

$LGSP$ = the natural logarithm of selling price,

β_0 = the intercept,
the coefficients,

$LGSQFT$ = the natural logarithm of square footage of living space,

$LGAGE$ = the natural logarithm of structure age,

$LGLOT$ = the natural logarithm of square feet in the lot, and

$LGDOM$ = the natural logarithm of days on market.

FIN = a dummy variable equal to one if the sale was financed with a conventional mortgage or paid for with cash; equal to zero otherwise,

AIR = a dummy variable equal to one if the house had central air conditioning; equal to zero otherwise,

$BASE$ = a dummy variable equal to one if the house contained a basement; equal to zero otherwise,

$BRICK$ = a dummy variable equal to one if the exterior was brick or stone; equal to zero otherwise,

$FIRE$ = a dummy variable set equal to one if the house contained no fireplace, two fireplaces, or three or more fireplaces, respectively; equal to zero otherwise,⁷

BED = a dummy variable equal to one if the house contained two, four, or five or more bedrooms, respectively; equal to zero otherwise,⁸

$BATH$ = a dummy variable equal to one if the property had one full bath, more than one but less than two full baths, two full baths, three full baths, or more than three full baths, respectively; equal to zero otherwise,⁹

GAR = a dummy variable equal to one if the property had no garage, a garage with one car space, or three or more car spaces, respectively; equal to zero otherwise,¹⁰

SEASON = a dummy variable equal to one if the property was listed during the winter, spring, or fall, respectively; equal to zero otherwise,¹¹

FIRM = a dummy variable equal to one if the firm that listed the property was a particular Top 3 firm, or a non-Top 3 firm; equal to zero otherwise, and¹²

ϵ = the error term.

It was determined that *LGSQFT* caused heteroskedasticity in (1). Therefore, (1) was estimated using generalized least squares regression, adjusted for *LGSQFT*. Equation (1) was also tested for multicollinearity using the "collinoint option" available in SAS [13]. The results indicate a moderate degree of multicollinearity.¹³

The estimation results of (1) are shown in Exhibit 2. With an adjusted r^2 of 0.9805, the model explains almost all of the variation in selling price for the properties in the sample.

To evaluate hypothesis 2 through 4, the estimators derived from (1) were applied to each property to determine its (dollar value) predicted price. Separate t -tests were conducted to evaluate each hypothesis. The TTEST procedure available on SAS [13], which computes a t -statistic for testing whether the means of two groups of observations are equal, was used.

Recall that the second null hypothesis was: *ceteris paribus*, leading agents list properties at the same price as non-leading agents. Hence, the variable of interest is; list price minus predicted price, divided by the predicted price ($[LP-PP]/PP$). Observations were grouped into one of two categories: (1) *TOPLIST*, the listing agent is a leading agent, and (2) *OTHER*, the listing agent is not a leading agent. An insignificant t -statistic

Exhibit 2
Estimation Results of Equation (1)

Variable	Estimated Coefficient	t -ratio	Variable	Estimated Coefficient	t -ratio
<i>LGSQFT</i>	0.000284	6.33	<i>BASE</i>	0.005973	0.24
<i>LGAGE</i>	-0.100021	-7.06	<i>AIR</i>	0.075230	2.67
<i>LGLOT</i>	0.110520	4.66	<i>FIRE0</i>	-0.164851	-5.73
<i>LGDOM</i>	-0.015827	-1.03	<i>FIRE2</i>	0.085202	1.67
<i>BED2</i>	-0.068201	-1.90	<i>FIRE3</i>	0.415222	3.34
<i>BED4</i>	-0.013180	-0.40	<i>BRICK</i>	0.062754	2.39
<i>BED5</i>	-0.113924	-0.91	<i>SPRING</i>	-0.052309	-1.87
<i>BATH1</i>	-0.162975	-3.30	<i>WINTER</i>	-0.040254	-1.21
<i>BATH1.5</i>	-0.088902	-1.88	<i>FALL</i>	-0.021057	-0.59
<i>BATH2</i>	-0.095533	-2.48	<i>FIN</i>	0.065836	2.48
<i>BATH3</i>	0.052242	0.80	<i>FIRM1</i>	-0.023455	-0.97
<i>BATH4</i>	0.105869	1.15	<i>FIRM3</i>	-0.049767	-1.17
<i>GAR0</i>	-0.176248	-3.35	<i>FIRMA</i>	-0.087212	-2.01
<i>GAR1</i>	-0.096373	-3.14	<i>INTERCEPT</i>	4.215544	37.61
<i>GAR3</i>	0.070729	1.25			

Adjusted $r^2 = 0.9805$

would not allow rejection of hypothesis 2 and indicate that leading agents list properties at the same price as non-leading agents. A positive t -statistic would indicate that leading agents list properties higher than others, and a negative t -statistic would indicate that they list properties lower than others.¹⁴

Recall that the third null hypothesis was: *ceteris paribus*, leading agents sell properties which are listed just as attractively (list price relative to predicted price) as non-leading agents. Again, the variable of interest is $([LP-PP]/PP)$. But, for the purpose of testing hypothesis 3, observations were grouped into one of the following two categories: (1) *TOPSELL*, the selling agent is a leading agent, and (2) *OTHER*, the selling agent is not a leading agent. An insignificant t -statistic would not allow rejection of hypothesis 3 and indicate that leading agents sell properties that are listed just as attractively (relative to predicted price) as leading agents. A positive t -statistic would indicate that leading agents sell properties listed higher relative to predicted price (or less attractively) than other agents, and a negative t -statistic would indicate that they sell properties listed lower relative to their predicted price (or more attractively) than those sold by others.

Recall that the fourth null hypothesis was: *ceteris paribus*, leading agents secure the same percentage of list price as non-leading agents. The variable of interest here is the ratio of selling price to list price (SP/LP), and the observations were grouped into either *TOPSELL* or *OTHER*, just as they were in testing hypothesis 3. An insignificant t -statistic would prevent rejection of hypothesis 4 and indicate that leading agents and non-leading agents secure the same percentage of list price. A positive t -statistic would indicate that leading agents secure a higher percentage of list price than non-leading agents. Such a finding would be consistent with the notion that leading agents have superior sales ability. A negative t -statistic would indicate that leading agents secure a lower percentage of list price than others. Such a finding may be inconsistent with the notion that they are operating in the best interest of their clients.

The results of the t -tests are summarized in Exhibit 3. The results indicate that we cannot reject hypotheses 2, 3, or 4.¹⁵ In essence, there is no significant difference between leading agents and others with regard to either the price at which homes are listed (hypothesis 2), the relative attractiveness of the list price for homes sold (hypothesis 3), or the percentage of list price obtained (hypothesis 4). For example, both groups obtained sale prices of approximately 97% of list price.

Exhibit 3
Summary of t -Test Results

Hypothesis	Variable of Interest	Group	Mean	t -value	Prob > t
2	$([LP-PP]/PP)$	<i>TOPLIST</i>	0.03801	-1.206	0.2294
		<i>OTHER</i>	0.07290		
3	$([LP-PP]/PP)$	<i>TOPSELL</i>	0.06731	0.9281	0.3549
		<i>OTHER</i>	0.03882		
4	SP/LP	<i>TOPSELL</i>	0.97634	1.1899	0.2352
		<i>OTHER</i>	0.97214		

Summary

This paper reports the results of an empirical study conducted to determine if leading residential real estate agents follow particular strategies that may enhance performance. The top ten agents of the Dayton, Ohio area were identified by a Board-sponsored contest that was based upon the amount of commissions generated by the agent. The performance of leading and non-leading agents was compared to determine if leading agents pursue certain performance-enhancing pricing and/or selling strategies.

One factor that contributed to the success of leading agents was that (due primarily to office location) they dealt in properties with significantly higher values than most other agents. This fact has been realized, and the contest has since been modified to reduce the advantage held by agents working in high-value areas. It was also found that leading agents dealt in higher valued properties than other agents working in the same area. Several other strategies that could enhance the generation of commissions were examined. No significant differences between leading and non-leading agents were discovered for either the price at which homes were listed, the relative attractiveness of the list price for homes sold, or the percentage of list price secured.

The results of this study indicate that, as a group, leading agents' performance is not augmented by the commission-enhancing strategies tested. Because there was inadequate data to yield statistically reliable results for individual agents in the sample, we cannot reject the idea that individual agents might employ such strategies.

Notes

¹In a study of both commercial and residential agents, Chinloy [2] found that males typically earn more than females.

²Zorn and Larsen [15] discuss this among other issues. With commission splitting, the agent will receive a portion of the total commission even if another agent sells the property, plus the listing agent generally has some period of time before the listing must be submitted to the MLS.

³Miller [12] suggests that the seller's urgency to sell may be a factor in setting the list price, but it is difficult to determine this information. We have attempted to control for this by including time on market in our predicted price model.

⁴Webb [14] presents mixed evidence on the effects of agents on the selling price of income-producing properties.

⁵To classify agents in the contest, the Board used commissions generated from a number of sources, including: the share of the total commission for listing and/or selling a variety of property types (condos, townhouses, etc.), unimproved lots, as well as referral fees. Computer information was available for approximately 80% of the transactions in which leading agents were involved. Of the observations for which information was available, nearly 90% were single-family, detached homes. Similar information was unavailable for non-leading agents.

⁶In a preliminary estimate of the data, locational differences were found to be insignificant, so they were dropped from the model.

⁷The holdout variable in the model was one fireplace which was the predominant value in the sample.

⁸The holdout variable in the model was three bedrooms which was the predominant value in the sample.

⁹The holdout variable in the model was two and a half bathrooms which was the predominant value in the sample.

¹⁰The holdout variable in the model was a garage with two car spaces which was the predominant value in the sample.

¹¹The holdout variable in the model was summer (homes listed during June, July, August) which was the predominant value in the sample.

¹²The holdout variable in the model was the Top 3 firm with the most observations.

¹³The degree of multicollinearity present in the model was not enough to result in unreliable estimators and is a direct result of correcting for heteroskedasticity. In essence, *LGSQFT* is more highly correlated with each variable than it was in the unadjusted model. Due to unavailable data, the study includes only properties that were eventually sold. As suggested by Larsen and Park [12], this may bias the results, because we are unable to analyze differences that may exist between leading and non-leading agents for expired listings.

¹⁴The TTEST program reverses the signs on the *t*-statistics from that normally shown in a regression estimate. For expository expedience, the explanation of signs in the body of the paper conforms to that of regression.

¹⁵Nearly identical results were obtained when the model was estimated without the homes listed by non-eligible owner/brokers.

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