Real Estate Brokerage Firm Characteristics and Home Sales Price Outcomes

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Abstract

This paper examines the effect of real estate brokerage firm characteristics, such as size and national affiliation, on home sales outcomes. It uses a hedonic pricing model with data from the Chatham County, Georgia real estate market from 2006 to 2010. The hedonic pricing model yields results that suggest larger brokerage firms obtain higher sales prices, while national affiliation is associated with lower sales price. The results also control for internal and external housing characteristics that are capitalized into the real sales prices of the housing transactions analyzed.

Keywords: Real estate brokers, Brokers, Brokerage, Housing

1. Introduction

Real estate agents and brokers are middlemen who use their knowledge and ability to facilitate exchanges between home buyers and sellers. The high frequency with which buyers and sellers choose to involve brokers suggests that these market participants value their services.[1] Since a house usually represents a large portion of an individual's wealth, understanding the transaction process is important.

This paper seeks to extend the literature on the effect of brokerage firm characteristics on the sales price of homes using a hedonic pricing model. The hedonic pricing model has been applied in a wide variety of circumstances to explore housing price behavior in many studies over the years. Overviews of this literature are provided by the comprehensive survey articles by Boyle and Kiel (2001) and Sirmans, Macpherson, and Zeitz (2005).

The NAR reports that in 2004 there were over 236,000 active real estate brokerage offices operating in the United States. Offices range in size from a single broker (who also serves as the office's lone agent) to very large firms serving an entire metropolitan area with hundreds of agents. This large disparity in firm size can be attributed to the MLS which make listings available through a computerized database inviting selling agents to cooperate in a transaction. Via such a platform, smaller firms advertize listings on an even footing with larger ones and exposure is obtained to the widest possible audience.

[1] The National Association of Realtors (NAR) reports that 84% of residential real estate transactions are conducted with the assistance of a real estate agent (www.Realtor.org).

Jud and Winkler (1994) explore brokerage firm and agent characteristics on the prices received by home sellers using MLS transactions (1991-1993) from Greensboro, North Carolina. Beyond the agent specific effects, they include brokerage office fixed effects for both the listing and selling office[2]. They find that individual brokerage offices (controlled for by fixed effects) have no statistically significant influence on generating excess returns. Turnbull and Dombrow (2007) control for agent specific effects as well as brokerage firm characteristics in a hedonic approach. The authors find that larger firms, both on the listing side as well as the selling side, tend to be associated with higher sales prices. Hughes (1995) likewise finds evidence that larger brokerage firms are associated with higher sales prices.

A few papers examine the effect of franchise affiliation on firm performance. Franchise affiliation can offer a recognized brand and may signal quality. This may be particularly important in real estate brokerage since a subset of home buyers may be new to an area with limited specialized knowledge of local firms. This could lead to increased reliance on firms affiliated with a nationally known franchise. Most work seems consistent with a non-negative association between franchise affiliation and firm earnings (see Frew and Jud (1986) and Jud and Winkler (1994)). Benjamin et al. use a 2001 national NAR survey of brokerage firms and find that while franchise affiliation is associated with higher revenues, it is not associated with higher profits, indicating that franchisors are able to extract rents from franchisees.

The next section provides a description of the data used to test for the potential effects of brokerage characteristics on home sale prices in Chatham County, Georgia. As is common in the literature, the model is estimated in linear and semi-log form. The subsequent section provides the results of several specifications of the model. The last section is a summarizing conclusion.

2. Framework for Empirical Analysis

Sirmans, Macpherson and Zeitz (2005), Murdoch, Singh, and Thayer (1993), and many others provide a thorough overview of the underlying theory and summary of numerous empirical applications of the hedonic pricing model, and thus are not reviewed in great detail here. The premise is that a house is comprised of a bundle of desirable and undesirable characteristics for utility-maximizing consumers to evaluate. These features are capitalized into the transaction price of the house. A hedonic pricing model can decompose the transaction price into attributes such as interior and exterior features, locational factors, characteristics related to the brokerage of the property, idiosyncratic characteristics associated with the house, and seasonal and annual fixed-effects. The model's estimated parameters provide information about the significance and magnitude of the effect of any given, observable, attribute of the house.

The hedonic pricing model applied in the present study takes the following form:

$$LnPRICEj = f(Ij, Ej, Bj, Oj)$$

Where:
LnPRICEj = the natural log of the real price of house j, where the price of the jth house is expressed in 2010 dollars;

Ij = a vector of interior physical characteristics for house j;
Ej = a vector of external physical characteristics for house j;
Bj = a vector of characteristics associated with the brokerage process for house j; and
Oj = a vector of other factors associated with house j.

This model is estimated using a six-year period of data from January 2005 throughDecember 2010 from the Savannah Board of Realtors' Multiple Listing Service. They were used to assess the relative importance of housing characteristics, brokerage characteristics, and time-related effects on real home sales prices in Chatham County, Georgia, which contains the city of Savannah (metro population of approximately330,000). Observations were limited to homes that were sold for at least $10,000 and less than $3 million, and had no missing values. This resulted in a sample of to 20,108 usable observations. Nominal housing prices were converted into real values using the quarterly CPI obtained through the BLS website (www.BLS.gov).

[2] In a given transaction there are typically two types of brokers: listing and selling. Listing brokers are those contacted by the home seller to assist in the selling process. Selling brokers bring potential buyers to the advertised home.

The average house in the sample was a single family dwelling (i.e. not a townhouse/condominium) located in the 31419 ZIP code, was 1,896 square feet, had two bathrooms, a fireplace, a two car garage, was on the market for 154 days, and sold for $249,693 in the third quarter of 2006.

There were a variety of interior and exterior physical characteristics available for each house sold, as well as other factors that were included in the analysis. These factors are listed and formally defined in Table 1. The key descriptive statistics for each of the variables considered in the analysis are provided in Table 2.

The interior physical characteristics of house j include: SQFT, the number of square feet of finished interior living space; FULLBATHS, the total number of full baths; HALFBATHS, the total number of half baths; and FIREPLACES, the total number of fireplaces. The number of bedrooms was omitted because it was highly correlated with SQFT and BATHS. The mean number of bedrooms was approximately 3.14, with a standard deviation of 0.78.

As observed in Sirmans, Macpherson and Zeitz (2005), and based on a variety of other studies, including Ford (1989), Clark and Herrin (1997), Coulson and Leichenko (2001), Leichenko, Coulson and Listokin (2001), Laurice and Bhattacharya (2005), Cebula, Gaynor, and Toma (2010), and Decker, Nielsen and Sindt (2005), the real sales price (PRICE and LnPRICE) of house j is expected to be an increasing function of the number of desirable internal physical housing characteristics.

The exterior physical characteristics of house j include: GARAGE_0 through GARAGE_4+, each a binary variable controlling for the number of garage spaces present; WATERFRNT, whether the house is on a waterfront lot; and CONDO, whether the house was a condo/townhouse as compared to a single family dwelling.

Since waterfront property is usually desirable, LnPRICE of house j is expected to be an increasing function of WATERFRNT. As observed by Laurice and Bhattacharya (2005), the number of garage spaces (Leichenko, Coulson and Listokin, 2001; Laurice and Bhattacharya, 2005) is likewise expected to be positively related to the selling price.

As older homes may have higher likelihood of needing repair and more imperfectly match modern preferences, controls for age of the home are included. AGE_0 through AGE_100PLUS, are binary variables controlling for the age range of the houses. As suggested in Sirmans, Macpherson and Zeitz (2005), Clark and Herrin (1997), Decker, Nielsen and Sindt (2005), Ford (1989), and Laurice and Bhattacharya (2005), the age of a house is expected to adversely influence its sales price. Accordingly, it is argued here that a "new" house will tend to command a greater market price.

Seasonal controls by quarter, Q1, Q2, Q3, and Q4 are included to control for seasonal effects. Likewise, yearly and locational controls are present in the form of year fixed effects and ZIP code fixed effects.

Since brokerage characteristics are the focus of this paper, variables related to the brokerage of each observation are included. NATIONAL is a binary variable equaling one if the listing brokerage firm is affiliated with a national franchise (Century 21, REMAX, etc). Frew and Jud (1986) find that homes sold via a franchised broker receive a higher price.DUALBROKER is a binary variable equaling one if the listing and selling brokerage is handled by the same firm. Jud (1994) finds that dual agency (the condition when the listing and selling in agents in a transaction are the same person) is associated with a slightly higher sales price. Turnbull and Dombrow (2007) find that houses listed and sold by the same firm sell for less.

Variables capturing listing and selling firm size were also constructed. The variable LISTSALES365 is the number of other homes that were listed and sold by the same listing firm as was associated with the observation within the last 365 days.[3] This variable serves as a measure of the size of the observation's brokerage firm at the time of sale. Similarly, the variable SELLSALES365 was used as a measure of the observation's associated selling brokerage firm size, as measured by other selling transactions by that broker within the last 365 days.

After consideration of an initial specification with LISTSALES365 and SELLSALES365, these variables are redefined as binary variables representing quintiles to allow for nonlinearity in their effects.

[3] Available sales data actually begin in January 2004, but since the number of associated sold homes in 2003 were unavailable, data from 2004 were not able to be used in the analysis other than in the construction of the firm size variables.

The variable VERYSMALLLIST is a binary variable equaling one if the associated listing firm is in the bottom quintile of listing firms (between 0 and 31 listing transactions).VERYSMALLLIST also serves as the reference group for this category. SMALLLIST is a binary variable equaling one if the associated listing firm is in the second quintile (32 to 81 transactions). MEDLIST, LARGELIST, and VERYLARGELIST all correspond to the next three quintiles (82 to 157, 158 to 323, and 324listing transactions and up, respectively).

VERYSMALLSELL is a binary variable equaling one when the associated selling firm is in the bottom quintile of selling firms (0 to 23 selling transactions), and this is the group's reference category. SMALLSELL, MEDSELL, LARGESELL, and VERYLARGESELL all correspond to the next four quintiles (24 to 76, 77 to 152, 153 to 310, 311selling transactions and up, respectively).

Table 1: Variables in the Model

PRICE : the price of house j expressed in 2010 dollars
LnPRICE : the natural log of the price of house j expressed in 2010 dollars
SQFT : the total number of square feet of finished living space in house j
FULLBATHS : the total number of full bathrooms in house j
HALFBATHS : the total number of half bathrooms in house j
FIREPLACE : the number of fireplaces in house j

GARAGE_0, GARAGE_1, GARAGE_2, GARAGE_3, GARAGE_4+ : binary variables equaling 1 when house has 0,1,2, 3, or 4+ garage spaces respectively, 0 otherwise (GARAGE_0 is omitted category)

WATERFRNT: a binary variable = 1 when house was waterfront and =0 otherwise
CONDO : a binary variable=1 when house was a townhouse or condominium, 0 otherwise

AGE_0, AGE_1_5, AGE_6_10, AGE_11_20, AGE_21_35, AGE_36_60, AGE_61_99, AGE_100+ : binary variables equaling 1 when the house is 0, 1 to 5, 6 to 10, 11 to 20, 21 to 35, 36 to 60, 61 to 99, or 100+ years old respectively, and 0 otherwise (AGE_0 is omitted category)

NATIONAL : a binary variable =1 if the associated listing firm was nationally affiliated, 0 otherwise
DUALBROKER : a binary variable =1 if, for the transaction, the listing and selling brokers were the same office, 0 otherwise
LISTSALE365: number of other homes the observation's listing broker has transacted in the last 365 days
SELLSALE365 : number of other homes the observation's selling broker has transacted in the last 365 days

VERYSMALLLIST, SMALLLIST, MEDLIST, LARGELIST, VERYLARGELIST: binary variables equaling 1 if the associated listing firm was in the first, second, third, fourth, or fifth quintile of listing firm size respectively, 0 otherwise (VERYSMALLLIST is omitted category)

VERYSMALLSELL, SMALLSELL, MEDSELL, LARGESELL, VERYLARGESELL: binary variables equaling 1 if the associated listing firm was in the first, second, third, fourth, or fifth quintile of selling firm size respectively, 0 otherwise (VERYSMALLSELL is the omitted category)

Q1, Q2, Q3, Q4 : binary variables equaling 1 when house was sold in first, second, third, or fourth quarter respectively, 0 otherwise (Q4 is omitted category)

Y2005 through Y2010 : binary variables =1 when the house was sold in the associated year, 0 otherwise

ZIP31302 through ZIP31416 : binary variables =1 when house was sold in the associated ZIP code, 0 otherwise

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation	Min	Max	
PRICE	247598	213503.9	10000	2885848	
LnPRICE	12.184	0.672	9.21	14.88	
SQFT	1879.5	877.651	330	18959	
FULLBATHS	2.055	0.729	0	10	
HALFBATHS	0.317	0.495	0	4	
FIREPLACES	0.737	0.899	0	13	
GARAGE_0	0.402	0.490	0	1	
GARAGE_1	0.125	0.330	0	1	
GARAGE_2	0.441	0.496	0	1	
GARAGE_3	0.028	0.164	0	1	
GARAGE_4+	0.004	0.066	0	1	
WATERFRONT	0.108	0.311	0	1	
CONDO	0.126	0.332	0	1	
AGE_0	0.099	0.298	0	1	
AGE_1_5	0.235	0.424	0	1	
AGE_6_10	0.095	0.293	0	1	
AGE_11_20	0.128	0.334	0	1	
AGE_21_35	0.136	0.343	0	1	
AGE_36_60	0.163	0.369	0	1	
AGE_61_99	0.084	0.278	0	1	
AGE_100+	0.040	0.197	0	1	
NATIONAL	0.580	0.494	0	1	
DUALBROKER	0.381	0.485	0	1	
LISTSALES365	183.59	182.26	0	706	
SELLSALES365	166.64	161.78	0	610	
VERYSMALLLIST	0.198	0.399	0	1	
SMALLLIST	0.201	0.401	0	1	
MEDLIST	0.201	0.401	0	1	
LARGELIST	0.199	0.399	0	1	
VERYLARGELIST	0.201	0.401	0	1	
VERYSMALLSELL	0.199	0.400	0	1	
SMALLSELL	0.199	0.400	0	1	
MEDSELL	0.200	0.401	0	1	
LARGESELL	0.201	0.400	0	1	
VERYLARGESELL	0.20	0.416	0	1	
Q1	0.211	0.408	0	1	
Q2	0.294	0.456	0	1	
Q3	0.272	0.445	0	1	
Q4	0.224	0.417	0	1	
Y2005	0.186	0.389	0	1	
Y2006	0.215	0.4110	0	1	
Y2007	0.183	0.387	0	1	
Y2008	0.141	0.348	0	1	
Y2009	0.138	0.345	0	1	
Y2010	0.137	0.344	0	1	
ZIP31302	0.007	0.081	0	1	
ZIP31319	0.000	0.019	0	1	
ZIP31322	0.150	0.357	0	1	
ZIP31324	0.001	0.032	0	1	
ZIP31328	0.029	0.167	0	1	
ZIP31401	0.075	0.264	0	1	
ZIP31404	0.123	0.256	0	1	
ZIP31405	0.123	0.329	0	1	
ZIP31406	0.088	0.283	0	1	
ZIP31407	0.040	0.196	0	1	
ZIP31408	0.011	0.104	0	1	
ZIP31409	0.001	0.031	0	1	
ZIP31410	0.111	0.313	0	1	
ZIP31411	0.062	0.240	0	1	
ZIP31415	0.012	0.109	0	1	
ZIP31416	0.000	0.022	0	1	
ZIP31419	0.213	0.409	0	1	

N=20,108

3. Empirical Results

This section presents the results of the estimated hedonic model described in the previous section. Two similar specifications were used, differing only in the way the firm size controls were operationalized. In the first specification, the firm size variables LISTSALES365 and SELLSALES365, which measure previous transactions by the brokerage firms (on the listing and selling side respectively) within the last year, were used. In the second specification, to allow for a non-linear effect of firm size, these variables were decomposed into categorical binary variables, each representing a quintile. In both, a semi-log specification was employed with LnPRICE as the dependent variable. In each of the estimates, the White (1980) procedure is adopted to correct for heteroskedasticity. Estimates are provided in Table 3.

Table 3: OLS Regression Results

	Specification 1 Dep Var: LNPRICE		Specification 2 Dep Var: LNPRICE	
Variable	Coef	T-stat	Coef	T-stat
Constant	10.895		10.890	
SQUAREFEET	0.0003***	12.460	0.0003***	12.340
FULLBATHS	0.118***	6.520	0.120***	6.630
HALFBATHS	0.079***	5.520	0.080***	5.630
FIREPLACES	0.0788***	11.000	0.077***	10.950
GARAGE_1	0.155***	18.180	0.152***	17.950
GARAGE_2	0.249***	29.840	0.247***	29.710
GARAGE_3	0.196***	8.260	0.195***	8.190
GARAGE_4+	0.285***	6.330	0.282***	6.270
WATERFRNT	0.166***	19.530	0.169***	19.980
CONDO	0.076***	6.160	0.073***	5.920
AGE_1_5	-0.020***	-3.000	-0.018***	-2.750
AGE_6_10	-0.072***	-8.180	-0.063***	-7.180
AGE_11_20	-0.112***	-12.620	-0.106***	-11.940
AGE_21_35	-0.131***	-13.300	-0.123***	-12.420
AGE_36_60	-0.113***	-9.810	-0.111***	-9.510
AGE_61_99	-0.114***	-6.190	-0.115***	-6.260
AGE_100+	0.064*	1.850	0.059*	1.720
NATIONAL	-0.100***	-15.600	-0.119***	-16.450
DUALBROKER	-0.016***	-2.950	-0.016***	-3.000
LISTSALE365	0.00007***	4.340	-	-
SELLSALE365	0.000003	0.190	-	-
SMALLLISTFIRM	-	-	-0.033***	-3.840
MEDLISTFIRM	-	-	0.059***	6.530
LARGELISTFIRM	-	-	0.077***	7.750
VERYLARGELISTFIRM	-	-	0.037***	3.600
SMALLSELLFIRM	-	-	-0.007	-0.920
MEDSELLFIRM	-	-	0.041***	5.080
LARGESELLFIRM	-	-	0.031***	3.640
VERYLARGESELLFIRM	-	-	0.00009	0.010
Q1	0.015*	1.930	0.014*	1.760
Q2	0.037***	5.180	0.035***	4.990
Q3	0.013*	1.810	0.012*	1.660
Y2005	0.287***	27.490	0.277***	26.410
Y2006	0.338***	34.580	0.325***	33.310
Y2007	0.333***	33.370	0.323***	32.360
Y2008	0.227***	22.070	0.218***	21.340
Y2009	0.088***	7.840	0.082***	7.320
ZIP31302	-0.195***	-4.730	-0.185***	-4.510
…	…	…	…	…
ZIP31416	-0.110**	-1.990	-0.109*	-1.740
Note a total of 14 binary ZIP code locational variables are included but suppressed				
R squared	0.728		0.732	
f-stat	1029.830		913.040	
Prob>F	0.000		0.000	
N=	20,108		20,108	

The estimated coefficients mostly exhibit the expected signs with most reaching high levels of statistical significance. The coefficient of determination indicates that for each specification, 73% of the variation in the dependent variable was explained by the model and the F-statistic is significant at far beyond the one percent level in both cases. Based on estimates in Table 4, the real sales price of houses in Chatham County is a positive function of size (SQFT), number of full and half bathrooms, garage spaces, waterfrontage, being a condominium, and fireplaces. Results suggest that new homes receive a premium versus existing ones, until a home is a century old. This is understandable as the city of Savannah has a well defined "historic landmark district" and while locational fixed effects control for much of this effect, having an historical home, as opposed to one that is simply old, could be desirable.

Note that while the signs were as expected on these interior characteristics, a few of the coefficients were larger in magnitude that what might be expected. For example, both models predict that each fireplace in home j would be associated with nearly an eight percent premium. Evaluated at the mean, this implies a $19,000 increase in value. One explanation of this high premium could be that this characteristic is correlated with other desirable amenities that are omitted from the model. For example, if homes with fireplaces are more likely to have other upgrades, such as granite countertops or more expensive fixtures, and these other characteristics are omitted from the model, the correlated variable will be biased upward.

Seasonality can be readily observed in the results. Relative to the fourth quarter, homes sold in the second quarter received a 3.5 to 3.7% premium over the two specifications. There appeared to also be an approximately 1% premium to homes sold in the first and third quarters (relative to the fourth), but the results only achieved statistical significance at the 10% level. The rise and fall of the housing boom can be readily seen in these results. Peaking in 2006, where home prices saw a 33% premium relative to their eventual level in 2010, home values experienced a steady decline, falling slowly at first (less than a percentage point in 2007), then declining around 11 percentage points in 2008, followed by yet another 14 percentage point decrease in 2009. All of these yearly fixed effects were highly statistically significant across both specifications. Locational controls were largely significant. This is suggestive that location is quite important with regards to the value of the home.

For example, relative to 31419 ZIP code, which was the ZIP code with the most observations, homes with comparable observable characteristics in the 31328 ZIP code sold for nearly twice as much. It is worth noting that 8% of the homes sold in the 31328 ZIPcode were over a million dollars, compared to only 0.16% of sales in the 31419 ZIP code.

Most pertinent to this study are the brokerage effects. Association with a national brokerage house, such as Century 21 or REMAX, is associated with a 10% to 11.7% decrease in sales price of the home. This result is inconsistent with that of Frew and Jud who found national affiliation to have a positive effect on sales price in their 1986 study with a sample of North Carolina cities. One possible explanation for this could involve the evolution of the brokerage process over the last few decades. As pointed out by Nadal (2006), clients often now conduct research before contacting a brokerage firm via the numerous public websites of homes for sale.[4]Previously, access the local Multiple Listing Service was the exclusive domain of agents/brokers and in the absence of such public information, potential buyers may have sought out familiar franchised firms to assist them. This informational advantage could then have granted those firms a small amount of market power over their clients and allowed them to steer buyers towards their own holdings. With this information becoming public, all homes now have a much more equal chance of being seen by potential buyers. Perhaps this leveling of exposure across firms has reduced the value of a franchise affiliation as buyers now often approach the agents/brokers with a list of homes they speculate could be suitable.

Homes that are listed and sold within the same brokerage house (i.e. when DUALBROKER=1) were associated with around a 1.5% lower sales price. One possible explanation could stem from the idea that agents and brokers have an informational advantage over their clients, as discussed by Rutherford (2005) and Levitt and Syverson (2005). Potential home buyers that have contacted a given firm constitute a ready pool of potential matches that are more readily available than the general pool of potential buyers at large.

[4]www.realtor.com is one such national site, but many communities have local sites that display the listings from the local Multiple Listing Service.

Since the brokerage firm has a clear incentive to have the home sell "in house", thereby collecting both sides of the commission, perhaps they use their informational advantage to persuade their clients to accept internal offers even if they are slightly below what the home could otherwise receive.

Results with regard to firm size effects were quite interesting. In the initial specification, the marginal effect of additional homes sold by the brokerage firm was associated with a higher sales price. This result was statistically significant at the 1% level. According to this model and evaluated at the mean sales price, listing your home with a firm that sells five houses more per month than an alternative firm will on average be associated with an additional $1000 in selling price. Size of the selling firm has no statistically significant effect in this specification.

In the second specification, with the firm size variables decomposed into binary categorical variables, an empirically richer picture emerges. Comparing the variables SMALLLISTFIRM, MEDLISTFIRM, LARGELISTFIRM, and VERYLARGELISTFIRM to the reference group (VERYSMALLLISTFIRM), the results suggest that there is an advantage (to the seller) in hiring larger firms. According to the model, firm size returns top out at 7.7%, which represent firms in the fourth quintile (between 139 and 307 other listing transactions within the last year). Returns to medium (third quintile) and the largest firms (fifth quintile) were 5.9% and 3.7% respectively relative to the smallest. Of course, one cannot rule out the possibility that larger firms are somehow more able to contract with properties that are more desirable over some dimension not easily captured via observable characteristics (i.e. "curb appeal", landscaping, etc).

A similar, if less dramatic, picture emerges when looking at the results from the selling side. Once again, medium to large firms appear to be associated with a higher sales price. From the buyer's perspective, working with smaller brokerage houses appears to be associated with a more desirable outcome. Relative to the smallest, medium (third quintile) and large firms (fourth quintile) are associated with a statistically noticeable 4.1% and 3.1% premium respectively. Oddly, the effect disappears with the largest firms.

Attention was then turned to the effects of brokerage in an "up" market versus in a "down" market. Table 3 reports the mean real sales price and number of transactions by year.

Table 4: Sales Price and Number of Sales By Year

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Year	Mean Sales Price	Number of Transactions
2005	$279,472	3,741
2006	$267,482	4,322
2007	$262,537	3,676
2008	$231,554	2,840
2009	$211,862	2,775
2010	$205,707	2,754

Though mean price declined slightly in 2007, it was not until 2008 that prices began falling dramatically. For this reason, 2005-2007 are henceforth considered "up market" years, while 2008-2010 are considered "down market" years.

Table 5: Up-Market vs. Down-Market Comparison

Table 5: Up Market vs. Down Market Comparison				
Up Market Years (2005-2007)			Down Market Years (2008-2010)	
Variable	Coef.	t-stat	Coef.	t-stat
SMALLLISTFIRM	-0.006	-0.570	-0.055***	-4.230
MEDLISTFIRM	0.060***	5.490	0.106***	6.220
LARGELISTFIRM	0.070***	5.200	0.076***	4.960
VERYLARGELISTFIRM	0.063***	5.090	-0.008	-0.440
SMALLSELLFIRM	-0.025**	-2.450	0.003	0.210
MEDIUMSELLFIRM	0.019*	1.940	0.056***	4.420
LARGESELLFIRM	0.042***	3.810	0.012	0.920
VERYLARGESELLFIRM	-0.008	-0.840	0.004	0.240
NATIONAL	-0.104***	-11.71	-0.126***	-10.4
DUALBROKER	-0.008	-1.18	-0.023**	-2.52
n=	11,738		8,368	
All other controls are present but suppressed.				

Comparing the effects of the brokerage characteristics fails to reveal a completely consistent picture. Medium and large listing firms appear to confer premiums to their brokered properties over different market conditions, with those firms generating larger premiums in a down market. However, in the down market, the largest firms perform no differently than the smallest, while the largest continue to generate a premium in the down market. On the sell side, once again the medium and large firms tend to be associated with higher sales prices in up and down markets, with this effect disappearing for the largest selling firms. It is worth noting that the dual brokerage effect is only present in the down market.

4. Conclusion

This study applies the hedonic pricing model to houses sold in Chatham County, Georgia in a six-year period from January 2005 through December 2010. The basic model structure is that internal and external housing attributes, general geographic controls, and time controls could potentially affect real housing prices. Furthermore, the models include controls for brokerage characteristics, such as national affiliation and brokerage firm size.

The findings of this study are that the natural log of real sales price of a house was a positive function of size (SQFT), number of full and half bathrooms, garage spaces, being waterfront, being a condominium, and fireplaces. Age had a negative effect on the sales price of the house except in cases where the house was at least 100 years old, in which case the effect was positive. Sale of the house during the first two quarters of the year raises the real sales price, and the boom and bust that characterized much of the national housing market was clearly discernible, with values peaking in 2006, with significant declines starting in 2008.

The focus of this study was to investigate how brokerage characteristics affected sales price. The models suggested that firms that had a national franchise affiliation brokered houses for significantly less. Additionally, there is evidence that clients listing their homes with larger brokerage firms receive a premium in the sales price, sometimes as large as 8%. Further analysis was then conducted on these brokerage characteristics in an "up market" versus a "down market" and the brokerage firm effects were roughly consistent across market conditions.

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