THE IMPACT OF PROPERTY FLIPPING ON

SINGLE FAMILY DETACHED

HOME PRICES

by

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ABSTRACT

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In 2003 HUD ruled that flipped properties, which are defined as recently acquired properties that have been resold, often within days, and for a substantial profit, are ineligible for FHA insured mortgage financing. This research uses the HUD ruling as the basis for this study. Their ruling was based on the perception that property flipping had a negative effect on home prices among other things.   The study uses hedonic modeling to empirically determine if houses that have previously flipped have any influence on value when compared to the non-flipped properties in the same market. Through a regression analysis, it is determined that the incidence of a flip does not significantly change the value of a home.

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CHAPTER 1

INTRODUCTION

1.1 Background and Definition of Problem

According to the U.S. Housing and Urban Development Office (HUD), property "flipping" occurs when a recently acquired property is resold, often within days, for a substantial profit through an artificially inflated price[1]. Furthermore, predatory lending results when homebuyers become victims of lenders, sellers and appraisers working in collusion to inflate the price of the property. Unwary home buyers either buy the property with a sales price far exceeding the actual fair market value of the real estate or are significantly overcharged with costs associated with obtaining a mortgage. Property flipping is not illegal in all cases. For example, a home re-builder following lawful practices and having an honest profit motive may identify a distressed property in the marketplace that can be acquired, remodeled and quickly resold at a much higher price. This is a lawful and valid transaction.

As a result of numerous allegations of predatory lending, on May 1, 2003, HUD issued its final ruling in Federal Register 4615, (FR 4615) entitled "Prohibition of

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[1] FR-4615-F-02, 24 CFR Part 203 "Prohibition of Property Flipping in HUD's Single Family Mortgage Insurance Programs."

Property Flipping in HUD's Single Family Mortgage Insurance Programs". The HUD ruling made flipped properties ineligible for FHA-insured mortgage financing, thereby precluding potential homebuyers from being the victims of predatory flipping. The ruling does not allow FHA backed loans to be underwritten when a property has been bought and resold within 90 days. Furthermore, additional stipulations are required for loans insured between day 91 and 180. In addition, the final rule authorizes HUD to impose additional protection against flipping for re-sales up to 12 months following acquisition by the seller. The ruling also forbids the assignment or sale of the sales contract, thus limiting the sale to the owner of record.

Flipping not only affects the immediate parties; buyer, appraisers, mortgage brokers, lenders and investors, it has several devastating effects for an entire neighborhood creating a domino effect of future problems. "Each flipped sale in a locality is an instance of a wrongly-priced deal that contributes to the economic perception of the neighborhood market. Flipping skews low-income housing markets since, in the future, genuine sellers and buyers will make inferences about surrounding property pricing based on past flips, without realizing the artificial nature of the sales. Flipping and fraudulent appraisals inflate the local real estate market, setting it up for future impending disaster."[2]

This analysis examines the affect of property flipping on single family sales prices in twelve multiple listing system (MLS) block areas throughout the Dallas Fort

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[2] Nagar (2004) Risk Management Reporter, Vol VII, No 2, "Focus on Flipping: Its devastating effects and what the government is doing about it."

Worth Metropolitan area of Texas. Beginning with the year 2001, two years before the implementation of HUD's final ruling, the study analyzes the MLS records of all single family houses that had more than one deed transfer within 365 days of one another; a flip according to HUD.

Sales prices are an important determination by authorities as to whether a property has been flipped. For example, in August of 2004, a Virginia based title insurance company filed lawsuits against three of its Maryland agents, claiming they are liable for allowing a number of fraudulent flip transactions to proceed. In all 23 cases mentioned in the lawsuit, properties were sold at prices substantially higher than the tax-assessed value. It is being argued that the agents should have recognized that the homes were being sold at inflated prices because the amount over the tax assessed value was so exorbitant. In one case, a property sold for $145,000 when its tax assessed value was only $31,000.[3]

Outside conditions, including but not limited to economic factors, interest rates, employment rates and political events were not measured. Although it is possible that the ruling had an effect on reducing fraudulent transactions, policymakers need to also be concerned with the impact on numerous other factors regarding single-family home ownership.

To date, no studies have been found that address the question as to the long-term impacts, other than fraud, that the HUD ruling may or may not comprise. Past research on the effect of predatory lending has mostly been limited to the real and

perceived abuses in other areas or predatory lending, such as false documentation, "straw buyers", fake identities and credit histories, as well as multiple settlement statements and sub prime lending scams. Their research is the backbone for this study. It will add to the body of works already in place and provides a better understanding of the market implications of HUD regulations and predatory lending practices associated with property flipping and wholesaling. While the vast majority of Congressional documentation on the predatory lending practice of property flipping points almost exclusively to fraud and government oversight, this report will highlight the extreme measure that HUD took to reduce a perceived problem. According to Congressional hearings, the loose policies of HUD before the ruling resulted in a large increase in FHA backed loans since conventional underwriting procedures were stricter.

All participants in the home buying process (buyers, sellers, lenders, appraisers, inspectors, home re-builders, minority groups and lawmakers) need to understand the effect of this regulation. Buyers and sellers must be aware of the risks, benefits and costs associated with purchasing a home. Since they both have a significant financial impact from the transaction, whether through equity or capital investment, it is imperative to understand the process of home buying. Lenders require an understanding of the law and the triggers that indicate a possible fraudulent transaction. Lenders must be aware of the reduction of sources for loan placement of properties that have not seasoned for the appropriate time. Appraisers and inspectors must be properly

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[3] Lawyers Title Insurance Corp vs. Maryland Settlement Services, Inc., Raflo Title and Settlements Inc., and Gideon Titles Inc., US District Court Baltimore, August 13, 2005

trained, certified and re-educated on signs of fraudulent activity. This is in addition to maintaining the standards of The Uniform Standards of Professional Appraisal Practices (USPAP) for all legitimate appraisers. Rehabbers must be aware of the costs associated with purchasing, remodeling and holding a property for additional time to meet the seasoning requirements and the possible costs associated with last minute loan denials when title seasoning is uncovered. Conventional lenders have adopted similar or sometimes even more stringent requirements than HUD. Most lenders are requiring title companies to provide a two year chain of title before making a loan commitment. Therefore it is important that all lenders adopt consistent systems and standards to eliminate any opportunity for wrongdoing in the wholesaling process.

1.2 Research Objectives

This study explores the impact of flipping and how it may or may not have on property values. By providing evidence on the effect on home prices this study can help educate policymakers and other parties interested in property flipping and its impact. This study seeks to:

1. Assemble a literature review of historical government regulations and their overall impact along with the methods used to determine the influence. The paper also reviews the studies that have evaluated the effect of amenities on single family home prices.

2. Construct a hedonic pricing model to isolate and measure the consequence of property flipping on market sales prices.

1.3 Data Source for Research

Data on single family home prices was obtained from the North Texas Real Estate Information System (NTREIS) and their MLS dating from January 2001 through November 5, 2005. MLS isolates home sales data by block area that results in small neighborhood segments. The data collected covers twelve areas, which are identified by numerals and locations within the MLS as follows: (5) Mesquite, (10) Addison, (11) North Dallas, (13) South East Dallas, (14) North Oak Cliff, (20) Plano, (22) Carrollton, (24) Garland, (55) Frisco, (85) Arlington SW Central, (128) Watauga and (273) Grand Prairie. It was necessary to use several areas because of the relatively small number of flips in 2001 that had also had subsequent sales in future years.

1.4 Research Hypothesis

This research looks at the influence of property flipping on single family detached home prices. The premise of the HUD ruling was that flipping caused home values to be over inflated and thus the bank or government was not able to reclaim its debt upon default because the value of the home had dropped. This paper will test the following hypotheses:

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1.4.1 Hypothesis (Null): Flipping does not affect the sales price of a single family home.

1.4.2 Hypothesis (Alternative): Flipping affects the sales price of a single family home.

The intent of this research is to provide more documentation to lawmakers on the true effect of property flipping so that balanced policy is developed that will effectively prevent fraudulent lending practices, encourage home buying and revitalize down trodden neighborhoods, while at the same time creating a budding business environment for investors, brokers and home re-builders that is both profitable and minimally restrictive.

1.5 Overview of Research Methodology

The research methodology for this project is the hedonic pricing method. The method allows for the total housing price to be broken down into quantitative and qualitative components. Using a multiple regression linear model we will test the hypothesis.

In a recent review of hedonic pricing models (Sirmans, Macpherson and Zietz, 2005), 125 studies were examined to find the most common characteristics used in the equations. Age is the most frequent characteristic used in hedonic models and typically has the expected negative sign. Square footage is the next most frequently used followed by garage and fireplace, all of which are used in this study.

Hedonic price functions provide a methodology for the analysis of differentiated goods such as housing, whose individual components do not have observable market prices. It has been used regularly since the first model in real estate analysis was introduced in 1971 (Smith, 1971) and established hedonic pricing as an effective methodology. This technique has been refined over time and today's models are robust and stable.

The dependent variable in this multiple regression study is the natural logarithm sales price. Numerous other independent variables are introduced with flips being our variable of interest. Sales data were collected from the year 2001 and compared to matched sales of the same property in 2005. Properties that sold more than once in 2001 were designated flips and properties that sold only once in 2001 were designated non flips. Each flip and non-flip from 2001 must have been re-sold again in 2005 to be included in the study.

1.6 Limitations

The number of flipped property observations is limited because most flipped properties do not ever reach the MLS. This study's original intent was to use property assessment records from the Collin County Central Appraisal District. There were over 3500 flips in Collin County in 2001. However, NTREIS data revealed there were only 332 flips recorded in MLS for the areas studied. Therefore, it is evident that flips are rarely bought and sold through the MLS service. The county tax records were too

incomplete to use as a source for analysis. This lack of data proved limiting in that the variable of interest has a fewer number of incidents than desired.

Also, no account of location or lot size is considered. The location limitation is due to the large geographic area used in the model while the lot size information in MLS was limited. Our study covers a broad spectrum of demographics from low income areas with poor school districts, limited business services and public transportation to suburban high income areas with excellent schools and long commutes to the central business district. Due to the small number of flips in this study, it is important not to generalize the results for other US real estate markets.

Lastly, market conditions related to the overall Dallas Fort Worth economy affected by the events of 9/11 are not considered. In 2005, the foreclosure rate in the area is one of the highest in the country and due to a significant economic reliance on the technology and the aviation sectors.

CHAPTER 2

LITERATURE REVIEW

2.1 Flipping as a Means of Predatory Lending

"It has the potential to be an epidemic," said Chris Swecker, FBI assistant director for criminal investigations. Property flipping is a common scheme in which property is appraised fraudulently at a much higher price and then quickly sold. The mortgagee is then left with a property worth less than the amount financed and in a worse condition than was previously disclosed.

Ten people were arrested on September 23, 2004 on federal charges in connection with a mortgage fraud-flipping scheme that involved about 200 properties and $15 million in fraudulently obtained loan proceeds. They were charged with 62 counts of wire fraud and conspiracy to launder money. U.S. Attorney Michael J. Sullivan in Springfield, MA announced the indictment that stated, "Several of the defendants allegedly purchased distressed properties within low-income neighborhoods and then resold them rapidly at artificially inflated values between 1998 and 2002."

This study uses the term "flipping" and "predatory lending" to refer to the transfer of property where fraud is used to obtain unfair prices and loans. The key is fraud which is an intentional act that is illegal. The Appraisals Standard Board of the

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Appraisal Foundation advises, "The negative connotation of property flipping is drastically different from buying and selling a property for a profit."

There have been numerous papers and reports on the affects on property flipping and the regulations governing them. This paper reviews the actual laws, industry reaction, congressional responses and the difficulty in defining what is property flipping and how it should be monitored. It also considers other types of predatory lending and the possible links to property flipping.

HUD Ruling FR-4615 (2003) is the final rule that addresses property flipping. The rule followed publication of the September 5, 2001 proposed ruling, which was offered to the public for two months of public comment. The ruling is a direct result of harsh criticism by members of Congress at hearings in June of 2000.[4] The document further defines flipping "as the predatory lending practice whereby a property recently acquired is resold for a considerable profit with an artificially inflated value, often abetted by a lender's collusion with the appraiser." This ruling established key elements in HUD's effort to curtail predatory lending. "The new requirements will make flipped properties ineligible for FHA-insured mortgage financing, thus precluding FHA home purchasers from becoming victims of predatory flipping activity." HUD addressed the concerns from 120 public comments on the 2001 proposed rule. The final ruling does not apply to sales by HUD of REO properties or mortgages insured by other governmental entities.

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[4] HUD's Government-Insured Mortgages: The Problem of Property "Flipping". Hearings before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs United States Senate, 106th Congress, Second Session. June 29 and 30, 2000.

The ruling notes that HUD has a "Neighborhood Watch" system, which provides public access to information regarding lenders with high rates of mortgage defaults. It also refutes claims that it already has enforcement actions in place to prohibit property flipping.

Focer (2000) in an article written for the National Housing Institute highlighting the effect of the property flipping "skew" on low-income housing prices, writes "When flipped properties go to foreclosure, as they almost inevitably do, often all at once, prices plummet below actual maker values until the excess inventory is absorbed. If another owner has to sell at the same time, they risk getting less than they owe on their mortgage." She notes that flipping is not new and that it was referenced in Brian Boyer's 1973 book on FHA-financed land flipping schemes, *Cities Destroyed for Cash*.

Childs (2004) discusses the difficulty in defining predatory lending. Without understanding all of the circumstances surrounding a particular transaction, it is not easy to place an exact definition on the act. The author reviews the different types of fraud and the battle for Federal Preemption of State statutes. States contend that federal laws are not strong enough and federal regulatory agencies have concerns that state lending regulations interfere with the ability of national financial institutions to regulate real estate.

Litan (2001), in a white report for the American Bankers Association, reviews the dangers to minority and low-income individuals and families, thought to be most victimized by predatory lending. He further discusses the government's role in creating a secondary market in mortgages including sub-prime lending which has led to

approximately two-thirds of Americans becoming homeowners. The study further defines predatory loans as those that would not have been made in markets that are more competitive. He also notes, "Most practices that are identified with predatory lending are already illegal under federal law."

The HUD/Treasury Report (2000) states that, "Defining the practices that make a loan, predatory, however, is a problematic task. Any list of predatory practices is destined to be incomplete because bad actors are constantly developing new abusive practices, sometimes to evade government regulation." Nonetheless, the report went on to define four specific practices that are characteristic of predatory lending: 1. Loan flipping, the repeated refinancing of loans in a short time in order for the lender to obtain fees, this should not be confused with property flipping, 2. Excessive fees, 3. Extension of unaffordable loans and 4. Outright fraud or deception.

Skillern et al (1999) noted "They did what a man with a gun in a dark alley couldn't do. They stole my house." [5] Because of the 1998 hearings, Skillern researched and studied data from the Home Mortgage Disclosure Act (HMDA), enacted in 1974. This Act requires certain financial institutions to report their mortgage lending practices to federal government including race and income level of the borrower. However, non-depository institutions are not required to report in all instances. In fact, HMDA data shows that in 1998, 28.6% of loans were non reported. Therefore, it is hard to significantly project the affect of predatory lending. Better HMDA data is needed to determine the type and quality of lending occurring.

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[5] Victim of Predatory lender in Senate testimony, March 1998

Klubes & Camet (2002) stated that HUD, the Federal Reserve, Congress and state attorney generals have made property-flipping investigations a priority all across the country. The assistant inspector general for the Department of Housing and Urban Development stated at a hearing that as of June 2000, there were 240 active property flipping investigations in 38 states, Puerto Rico and the District of Columbia. The writers discuss the other governmental regulations and laws that are in place to stop fraudulent activity, which includes flipping such as the Racketeering Influenced and Corrupt Organization Act, and unfair and deceptive trade practices laws. The suggestion that banking institutions should implement a "seasoning" requirement as a protection against mortgages that have been tainted by flipping activity is reviewed.

2.2 Regulatory Event & Amenity Effect Studies

Government regulations have consistently been under scrutiny over the years as society has argued and empirically analyzed the impact of specific laws. While compiling the research for this document several prior event studies and their methodology were reviewed. From cable deregulation to revenue acts, government has had a significant impact on the real estate markets.

Housing has numerous characteristics that impact price while each characteristic alone does not have its own recognizable price. There has been a large amount of research on the impact of these externalities or unobserved and un-priced influences. To find out the most important influences on price we review several different amenity

effect studies. These studies form the backbone for the hedonic methodology chosen for this paper.

Dotzour & Levi (1992) empirically determined whether houses owned and sold by corporate relocation companies sell at a lower price when compared to the non corporate transactions in the same market. They tested their hypothesis by using a hedonic model of 278 residential transactions in one Florida community. They found that corporate properties sold at a discount of nearly 5% through a multiple regression model and the further examination of the collinearity and eigenvalues.

Sirmans, Macpherson and Zietz (2005) analyzed the results of 125 independent studies that used hedonic methodology on real estate transactions. By identifying the top characteristics and their coefficients, they determined the positive or negative effect. The top twenty characteristics appearing most often in Hedonic Pricing Models were revealed and the number of times the appearance had a positive, negative or insignificant effect on the property. In addition, eight categories were identified and the top characteristics in those categories. Their categories included, construction, internal features, external amenities, natural environmental, neighborhood and location, public service environment, marketing and financial issues.

Nelson et al (2005) examined the amenity effect of artificial canals on tax assessed values of single family homes. They used tax assessment data obtained from a local appraisal district in conjunction with MLS data to develop hedonic modeling. Their methodology approach isolated the impact of canal presence on residential home values. The proximity value of canal frontage on single family homes is modeled

through a multiple regression procedure to test for the impact of the waterway. The study ultimately found that canal frontage had a significant and positive impact on the total tax value of the properties.

Harvey & Nigro (2004) examined the 1999 North Carolina predatory lending law on mortgage activity in that state versus other southern states. They used HMDA data and found that the law reduced the number of sub prime loans. Five separate tests were used to examine whether the implementation of the North Carolina legislation had an impact on sub prime loan applications, origination volumes, denial rates and the market share of non-bank lenders compared to their bank counterparts, as previously mentioned in the Skillern (1999) report. The report used univariate results and a multivariate analysis.

Harvey & Nigro (2003) studies the effects of the predatory lending laws in the cities of Chicago and Philadelphia. After the implementation of Regulation Z, a disclosure law that increased the number of loans covered by the Home Equity Protection Act (HOEPA), the HOEPA revisions did not prohibit any lending practices. Chicago and Philadelphia were two of the first cities to enact predatory lending laws. The report uses empirical tests to examine the changes in mortgage flows following the laws. The study found that in Chicago, a sub-prime loan was more likely to be made by a non-bank after the passage of the law. However, in Philadelphia, where the legislation was aimed at all financial institutions not just banks, as in Chicago, a decline was observed with sub prime loan originations with minority and low-income markets segments experiencing the largest impact.

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Howe & Jain (2004) examined two effects of the REIT Modernization Act (RMA) of 1999. Stock market reaction to the passage of the RMA was the measure of its effect on REIT's. An event study methodology was used to examine the effect on the entire REIT industry followed by a cross-sectional methodology to determine which type REIT was expected to gain or lose more from the passage of the RMA. The study extended the work done in the area involving event studies on other regulatory issues. The results of the study showed a modest positive wealth effect associated with the legislative event.

Hoag (2002) looked at the deregulation of the cable industry and its affect on the industry. Any extraordinary profits by cable companies may have had less to do with the enactment of the law than with other factors such as stock market growth. The paper was built upon the research of two prior studies. One used empirical work to study the effects of the Cable Communications Policy Act of 1984 (CCPA). Another study looks at a substantial body of economics and finance literature that reviews regulatory impact.

Peek & Rosengren (1996) discussed whether the correlation between real estate lending and bank capital is a result of voluntary actions by banks to recapitalize or the direct result of bank regulators. The finding that banks with low capital ratios reduce their lending more after formal regulatory actions is a result of the report. This has a greater impact on real estate borrowers.

Muhtaseb & Karayan (1996) documented the impact of the Revenue Act of 1987 on the "common stock" prices of master limited partnerships (MLP's) After five

significant legislative phases the Act reduced the tax advantages of investing in MLP's. The event study methodology was used by reviewing daily rates of return for the MLP's which were obtained from the CPSP Daily Stock Returns file.

Wells (2003) in his report on event study methodology discussed the process and theoretical basis for the event study. He further outlines the problems associated with this type of research. "The goal of an event study is to determine whether or not a specific event affects investor behavior and, subsequently, the return on related stocks." He further emphasizes that "if the researcher is unable to filter out extraneous factors, the impact of the event may be lost in the noise. Our report does not filter the economic conditions in the US during the event study; rather the US reported economic indicators are mentioned as a point of reference."

Harrison, Smersh and Schwartz (2001) in their report on the effect of the National Flood Insurance Reform Act of 1994 used hedonic modeling to show that property tax assessors slightly over valued properties located in the 100 year flood zones. The price differential is less than the present value of future flood insurance premiums. In addition, the price differential increased after the Reform Act passed. They used a large database of 29,887 transactions in Florida and a lengthy period of analysis which were broader than prior research efforts.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Methodology

This research uses the HUD ruling as the basis for the study. Their ruling was based on the perception that property flipping had a negative effect on home prices among other things. The study uses hedonic modeling to empirically determine if houses that have previously flipped have any influence on value when compared to the non-flipped properties in the same market. Through a regression analysis, it is determined that the incidence of a flip does not significantly change the value of a home.

3.2 Data: Source and Treatment

The research focused on twelve non contiguous MLS block areas that include parts of three counties situated in the Dallas Fort Worth metropolitan area of North Texas. The three counties have a population of over 4.6 million residents (North Central Texas Council of Governments, 2005).

Data on single family detached home sales in the study were gathered from NTREIS via the MLS. NTREIS provides sales data from participating real estate brokers and is generally accepted to be a reliable representation of market activity since

the majority of brokers subscribe and participate. The source for the all of the attribute data for these subject areas came from the MLS.

The MLS is divided into block areas and sub areas. The data can be sorted in various ways to extract the required characteristics for the study. Sales were collected for the year 2001 for both flipped properties (sold more than once in the year) and non flipped properties (sold once in the year). Those properties were then matched with sales for the identical property in 2005. The data covers a large area with diverse demographics because the incidence of flips were so rare..

The initial search produced over 22,682 records for the year 2001. This was reduced to 728 observations once the data were matched to the 2005 sales, then further reduced to 712 observations after adjusting for incomplete information or missing data. The most common reason for removing data were an incongruous "year built" variable. The lack of this variable prevented the calculation of the proper age of the home. Incomplete sales amounts, inconsistent square footage amounts in addition to odd bathroom or bedroom information were other reasons for data removal.

The houses range from one to six bedrooms and in age from four years to 89 years. Additional variables of the sample data are presented in table 3.1. The variables were chosen based on the available data compared to the list of top characteristics as defined by Sirmans et al (2005). Air conditioning was a variable used because of the extreme summer heat and a perceived increase in price for houses with central heat and air conditioning.

Table 3.1 Model Variables

Variable		Description
Sales Price	LN_SP	Natural logarithm of recorded sales price
Bedrooms	BEDS	Number of bedrooms
Full Bathrooms	FBATH	Number of full bathrooms
Half Bathrooms	HBATH	Number of half bathrooms
Garage	GAR	Number of garage parking spaces
Age	AGE	Actual age of the dwelling in 2005
Square Footage	SQFT	Size of the dwelling/1000
Pool	POOL	1, if dwelling has a pool or 0, otherwise
Days on Market	DOM	Number of days dwelling was on market
Fireplace	FP	1, if dwelling has fireplace or 0, otherwise
Central Heat and Air	HVAC	1, if dwelling has central AC or 0, otherwise
Flipped Property	FLIP	1, if dwelling flipped in 2001 or 0, otherwise

3.3 Hedonic Modeling

In general, the price of a house is related to the characteristics of the house and property itself, the characteristics of the neighborhood and community, and sometimes environmental conditions. The data are analyzed using the regression analysis, which relates the price of the property to its characteristics of interest. The effects of the different characteristics are then estimated and will show how much property values will change for small changes in each characteristic, holding all characteristics constant. The strength of a hedonic model is that it can be used to estimate values based on actual choices. Furthermore, since property data are typically readily available, hedonic modeling is a good indication of value and the method is somewhat versatile and can be adapted to consider several interactions between amenities or external factors.

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"Hedonic pricing theory postulates that the value of a house is a function of the quantitative and qualitative attributes that are components of the house. Hedonic pricing theory is tested using a multiple regression analysis (MRA)" (Dotzour & Levi, 1991), where:

Sales Price of a house = $f(X_i, Y_i)$, where

$X_{i\,=}$ vector of quantitative factors such as age, size, baths, fireplaces, and garage;

$Y_{i\,=}$ vector of qualitative factors such as neighborhood condition, physical property condition, and school district.

To test the hypothesis a semi-log multiple regression was constructed according to the following form:

Ln $(SP) = f(X_i, Y_i, Z)$,

Where Z = 1, if house was a flip, or = 0 otherwise.

The MRA requires that there be no multicollinearity. The presence of collinearity among variables can create difficulty in measuring the influence of one specific variable in sales price. If the specific variable of interest is highly correlated with other variables in the model, hypothesis testing of the influence becomes problematic. A correlation coefficient of -1 implies a perfect negative relationship while a 1 implies that the two variables are perfectly, positively related. A value of 0 implies the two variables are not linearly related. If two independent variables have a correlation coefficient of 0.8 or greater, then this may signal a high multicollinearity

problem. It is important to note that high collinearity is a nuisance, but it doesn't destroy any of the desirable properties of the ordinary least-squares model.[6]

From the candidate variables a stepwise regression model may be used in order to discover the relevant explanatory variables and further isolate collinearity. The procedure involves sequentially entering variables into the model. The independent variable with the largest correlation with the dependent variable is entered into the model first and variables are subsequently entered one at a time. However, this method was not used since the independent variables have already been proven relevant by previous studies (Sirmans et al, 2005).

[6] <u>Regression Basics</u>, Leo H. Kahane, 2001

CHAPTER 4

EMPIRICAL RESEARCH AND RESULTS

4.1 Regression Model

The descriptive statistics of the market model variables used in the analysis are detailed in Table 4.1. There were 712 observations. The dependent variable, the natural log of the sales price (LN_SP), ranged from 9.68 to 14.39 with a mean of 11.993. The independent variable, the homes square feet/1000, had a mean of 2.154. There were at most six bedroom, six full bathrooms, five half bathrooms and a maximum garage capacity of six spaces. The newest home was four years old while the oldest was 89 years old. The presence of central heat and air conditioning was given a dummy variable of 1 if it existed and 0 otherwise, while the existence of a fireplace and pool were handled in the same manner. The mean age was 25.50 years and finally there were 14 properties which had been flipped.

Table 4.1 Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
SP_LN	9.68	14.39	11.993	0.683
BEDS	1	6	3.39	0.683
FBATH	1	6	2.20	0.720
HBATH	0	2	0.34	0.494
GAR	0	4	1.84	0.723
AGE	4	89	25.50	16.937
SQFT	0.62	6.89	2.154	0.9256
POOL	0	1	0.22	0.413
DOM	0	335	41.18	45.769
FP	0	3	0.97	0.534
HVAC	0	1	0.95	0.219
FLIP	0	1	0.02	0.139

The hypothesis test involves the presence of a flipped property having an affect on the selling price of a single family home. Multiple regression analysis was employed to measure the magnitude of the flip on the selling price, if any. The following model was tested (Nelson et al 2004):

$$SP\_LN_t = b_0 + b_1 FLIP_t + b_2 BEDS_t + b_3\ FBATH_t + b_4\ HBATH_t + b_5\ GAR_t + b_6\ AGE_t +$$
$$b_7\ SQFT/1000_t + b_8\ POOL_t + b_9\ DOM_t + b_{10}\ FP_t + b_{11}\ HVAC_t + \epsilon_t$$

Table 4.2 shows the results of the model regression analysis. This model was reduced to find the most efficient model, which uses the least number of variables, based on Sirmans, et al., and involves a high adjusted R^2 and involves little significant multicollinearity incidents.

Table 4.2 Regression Analysis

	Standardized Coefficients			Collinearity Statistics	
	Beta	t	p	Tolerance	VIF
Intercept		90.196	.0000		
BEDS	-0.117	-4.010	0.000	0.436	2.294
FBATH	0.058	1.400	0.162	0.215	4.649
HBATH	0.047	1.891	0.059	0.601	1.664
GAR	0.109	4.140	0.000	0.538	1.860
AGE	0.136	5.563	0.000	0.617	1.621
SQFT	0.709	14.078	0.000	0.146	6.854
POOL	0.054	2.512	0.012	0.804	1.243
DOM	-0.014	-0.728	0.467	0.952	1.050
FP	0.150	5.623	0.000	0.517	1.932
HVAC	0.088	4.185	0.000	0.841	1.188
FLIP	-0.008	-0.401	0.689	0.992	1.008

N= 712 R^2 = .741   Adjusted R^2 = .737

Error of Estimate = .3502 F = 182.328 $F\ Sig$ = .000

Collinearity occurs if there is a high correlation between independent variables. Multicollinearity occurs when two or more independent variables are highly correlated.

Table 4.3 shows the Pearson Correlation Matrix which is used to determine if the *FLIP* variable or any other independent variable was highly correlated with other variables in this model. However the absence of a high simple correlation between the *FLIP* variable and the others independent variables is not enough to prove the lack of collinearity because *FLIP* may be correlated in a multidimensional fashion with a combination of two or more variables in the data. The matrix indicated a high correlation, over 0.80 between SQFT and FBATH (.828) which may indicate the

findings may not be valid. Table 4.2 also includes the Variance Inflation Factor (VIF) for every variable. A large VIF may also indicate a high degree of multicollinearity.

Therefore, multicollinearity was also measured in this study by the (VIF). For example, the factor for the *FLIP* variable is defined as:

$$VIF_{flip} = \frac{1}{1 - R^2_{flip}}, \text{ where } R^2_{flip} \text{ is the multiple correlation coefficient or } FLIP$$

regressed on the remaining independent variables.

Generally a VIF under four should not impact the research results while a VIF between four and ten indicates there is a chance the estimation will be biased and have an effect on the research results. SQFT and FBATH both have VIF values over four at 4.649 and 6.854. The Pearson Correlation Matrix indicates there is a high correlation between number of square footage of a home and the number of bathrooms. There appears to be no other significant collinearity problems with the data.

Table 4.3 Pearson Correlation Matrix

	LN_SP	BED	FBATH	HBATH	GAR	AGE	SQFT	POOL	DOM	FP	HVAC	FLIP
LN_SP	1.000	.533	.702	.373	.535	-.280	.830	.408	.117	.635	.240	-.036
BED	.533	1.000	.662	.292	.401	-.376	.730	.281	.151	.418	.132	-.052
FBATH	.702	.662	1.000	.127	.542	-.428	.828	.391	.123	.581	.243	-.040
HBATH	.373	.292	.127	1.000	.231	-.215	.438	.181	.126	.221	.055	-.036
GAR	.535	.401	.542	.231	1.000	-.535	.547	.233	.022	.510	.311	-.052
AGE	-.280	-.376	-.428	-.215	-.535	1.000	-.384	-.104	-.044	-.414	-.318	.021
SQFT	.830	.730	.828	.438	.547	-.384	1.000	.424	.180	.640	.166	-.029
POOL	.408	.281	.391	.181	.233	-.104	.424	1.000	.075	.269	.060	-.026
DOM	.117	.151	.123	.126	.022	-.044	.180	.075	1.000	.058	-.012	-.027
FP	.635	.418	.581	.221	.510	-.414	.640	.269	.058	1.000	.265	-.031
HVAC	.240	.132	.243	.055	.311	-.318	.166	.060	-.012	.265	1.000	-.013
FLIP	-.036	-.052	-.040	-.036	-.052	.021	-.029	-.026	-.027	-.031	-.013	1.000

One- tailed

The model used a criterion of an F significance of 0.05 and explains 74% of the home sales price. The variables are consistent with results of Sirmans et al as far as the positive and /or negative effect.

From this regression analysis, the selection of the *FLIP* variable suggests that the null hypothesis can not be rejected. There is virtually no influence on the sales price by the presence of a flipped property. Not only is the coefficient beta low but the *p* value indicates, with a value of .689, that the coefficient is probably no different than 0. Therefore, the model clearly reveals there is no significant change in value because of the incidence of a flip.

4.2 Research Summary

This research investigates the impact of property flipping on residential single family detached home values. Data was collected from the MLS in the Dallas Fort Worth metropolitan area. The following hypothesis was tested:

Hypothesis (Null): Flipping does not affect the sales price of a single family detached home.

Hypothesis (Alternative): Flipping affects the sales price of a single family detached home.

The null hypothesis was not rejected through a multiple regression analysis. Variables that captured housing attributes such as age, square footage and days on market found that flipping does not have any measurable affect on property sales prices.

This research is the first known study on the effects of property flipping. It is important for lawmakers as well as appraisers, buyers and investors to understand the true impact of property flipping to the housing industry. As the model shows there is no measurable change in home prices because of property flipping.

Property flipping is obviously perceived as a serious problem and it was recognized in our research that most flipped properties are not recorded in the MLS system, therefore further research into property flipping could study the affect on flipping from a tax assessment approach where deed records would reveal a more accurate sample of flips. Another useful extension of this study would be to examine the impact that property flipping has on the default or foreclosure rates of properties that had previously been flipped and the impact to the subsequent neighborhoods. One could also examine whether the HUD ruling resulted in a reduction in the number of flips and did that lower the default rates of FHA loans.

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