

Toward an Understanding of the Effect of Market Share on Median Home Sales Price: An Analysis of the Top 10 Home Builders per MSA

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Abstract

This study analyzes the market share of the top 10 home builders in nine Metropolitan Statistical Areas, along with fourteen other independent variables, to find a statistical relationship with median home sales price. Through a stepwise regression of the independent variables it is determined that there is no correlation between median home sale price and market share of the top 10 home builders. In the stepwise regression two variables are found to be correlated to median homes sales price: Owner Occupancy Percentage and Residential Construction Wages, a data point compiled for this study. A linear regression is run between market share of the top 10 and median home sale price and no correlation is found.

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General Audience Abstract

This study observes changes in median home sale price and changes in the market concentration of the top 10 home builders. Data from nine cities was analyzed. Using linear regression with the two previously mentioned variables along with fourteen other variables the study finds no relationship between the two variables. Among the variables the two that had the highest statistical relationship are Owner Occupancy Percentage and Residential Construction Wages. This study is relevant to the on-going discussion about concentration in the housing market.

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Introduction

Scholars have written about local market factors and their effect on home sales price for some time (Hwang and Quigley 2006; Manning 1986, 1989). Research has focused on market concentration of homebuilding firms as a contributing factor to home sales price (Somerville 1999b; Cosman and Quintero 2017). A readily available statistic from Hanley Wood's Builder magazine is market share of the top 10 home builders in the United States' most active housing markets. The top 10 home builders fluctuate in market share from year to year and from market to market. This study uses variance inflation factors and stepwise regression to analyze the market share of the top 10 home builders in nine different Metropolitan Statistical Areas (MSAs). With top 10 home builder market concentration data and other local market housing and economic data, this study works toward understanding the relationships between top 10 home building firms' market share and median home sales price.

A few large home building companies (commonly termed "production builders") in the U.S. build and sell a large portion of the nation's single-family homes. Ten companies accounted for 27.4% of all home closings in the U.S. in 2016 (NAHB, 2018). Frey (2003) observed that the top 10 home builders in the U.S. doubled their concentration in the market and tripled the number of home closings between the late 1980s and the late 1990s. Figure 1 illustrates Frey's observation of the market share of the top 10 home builders from 1989 to 2016. Well into the 1990s, the top 10 home builders accounted for 10 - 12% of home closings. The top 10 firms closed more than 20% of new home sales in 2002 and since then the share of new home closings by the top 10 has not dipped below 20%.

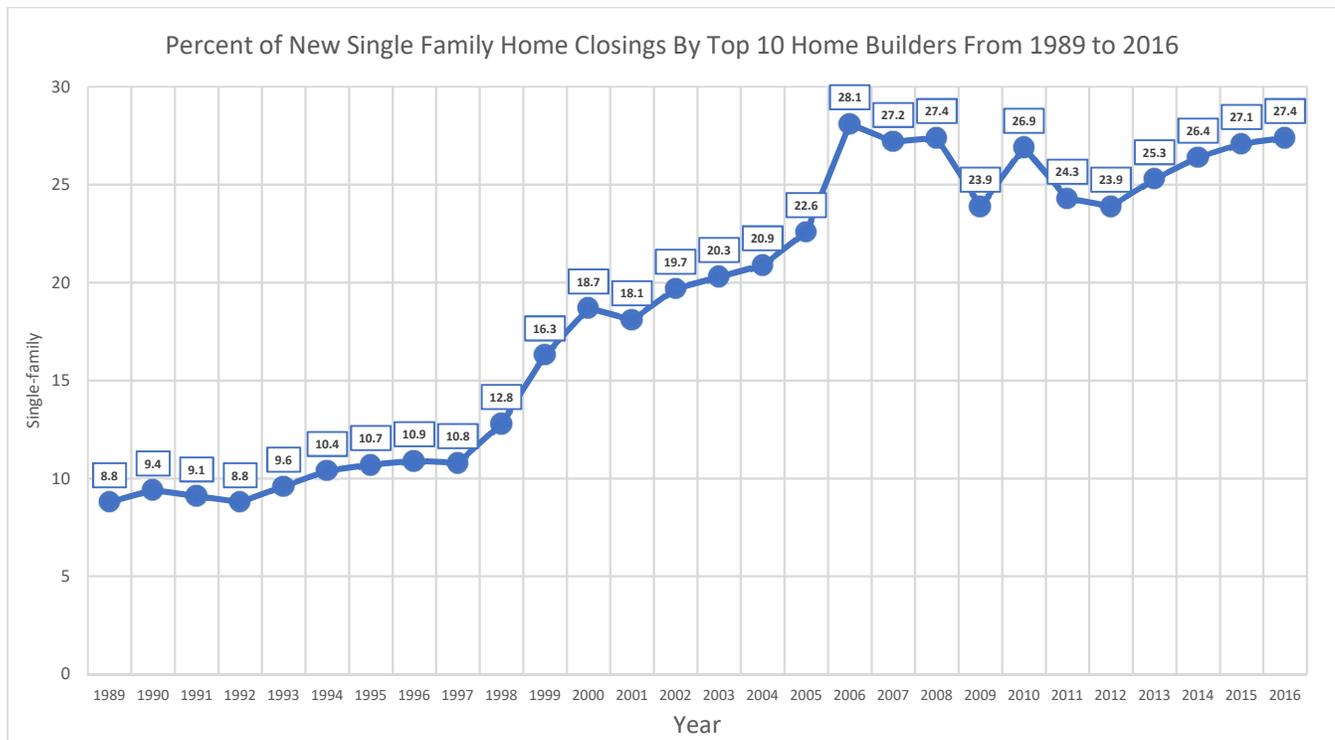


Figure 1 – Percent of New Single-Family Home Closings by Top 10 Home Builders From 1989 to 2016 (Frey (2003), NAHB (2014, 2017))

Frey's (2003) study also noted that a majority of market concentration occurred through mergers and acquisitions where top 10 home builders expanded into new markets. Large home builders are noted for being early adopters of innovation and relying on scales of economy to reduce costs for home building (Koebel and McCoy, 2006). Scholarly research has documented factors, such as classification of employment (Barth et al., 2015), local land use regulations (Somerville 1999b), and overestimation of demand (Mueller 1995), that contribute to median home sales price in a housing market. Until now, few scholars have considered whether the top 10 home builders market share of home closings could be a contributing factor to median home sales price.

Background

Single-family detached housing is a critical part of the U.S. economy and is the principle housing option for U.S. households. The National Association of Home Builders (NAHB) states that residential investment and consumption of housing services contributes to 15-18% of the U.S. Gross Domestic product (NAHB 2018). These homes also provide secure financial investment for families. In 2017, an analysis of Census Bureau data determined home equity represented 73.39% of total net worth for U.S. households (Wang 2017). Regarding occupancy, according to the U.S. Census Bureau's (2018) 2016 American Community Survey 5-year estimate, 61.7 million households lived in a single-family detached home as homeowners, and another 12.2 million households rented a single-family detached home. Of the 117.7 million total U.S. households in 2016, 74% lived in single-family detached homes (U.S. Census Bureau 2018). The housing market and the value of homes is vital to families, professionals and the U.S. economy. Trends within geographical regions in median home sales price allow greater insight into fluctuations in home price (Manning 1986).

Manning (1986) was one of the first scholars to demonstrate that U.S. median home sales price could not be analyzed nationally due to variations from city to city and region to region. Metropolitan Statistical Areas (MSAs) are defined by the U.S. Census Bureau as a county or counties connected to an urban area or city through commuting routes. Variations in income, quality of life and housing demand, among others, in each MSA contribute to differences in median resale home price from city to city (Manning 1986). Home building activity and home price are also affected by variations across each MSA.

Studies have researched factors related to and tangential to the home building activity to find variables relevant to home price. Somerville (1999a) created an empirical model that determined increases in a city's construction costs resulted in fewer home starts and changes in home sales price. Zahirovich-Herbert and Gibler (2014) found a statistical relationship between home size and home sales price relative

to surrounding existing homes. Barth et al. (2015) found that MSAs with less-concentrated employment do not experience an increase in home sales price with an increase in employment concentration. However, already highly-concentrated employment MSAs see higher home sales price when employment function concentration increases (Barth et al., 2015). Academic inquiries have seen home builder market concentration, the number of home builders that produce the majority of new housing stock, as a possible contributing factor to median home sales price (Cosman & Quintero 2017).

Literature Review

The expansion of the top 10 national home builders was mostly through acquisitions that provided access for national builders into new housing markets (Haughwout et al., 2013). Acquisitions resulted in cost advantages and local knowledge of housing markets (Haughwout et al., 2013). Haughwout et al. (2013) researched the “new home premium” which is the extra amount of money that home buyers are willing to pay for a new home. From 1987 to 2005 new homes increased in total square footage, number of bathrooms, and other amenities causing an increase in construction costs (Haughwout et al., 2013). Haughwout et al. (2013) analyzed housing characteristic data tracked by the U.S. Census Bureau’s American Housing Survey, and through a hedonic regression model concluded that the “new home premium” remained unchanged from 1987 to 2005. As new home prices increased over these years, the premium individuals were willing to pay to purchase a new home did not. In other words, new home buyers got more from a new home purchase but were not willing to pay more for the benefits a new house provides. As home prices go up, home builders find ways to sell homes at the price home buyers are willing to pay.

McCoy et al.’s (2015) study home builder adoption of high efficiency windows analyzed local market characteristics in conjunction with housing technology and innovation. In their study, production home builders influenced the home building process with their ability to diffuse innovation (McCoy et al. 2015). Production builders streamline the design selection process and produce savings through an economy of

scale (Koebel and McCoy 2006). Cost efficiency initiatives by home builders allow builders to reduce production costs of home building, but factors other than cost influence home price.

Somerville (1999b) found empirical relationships between local market characteristics such as land use regulation, housing demand, and residential construction firm concentration. As land use regulation increased, developable land decreased, and the number of residential construction firms decreased. As housing demand went up the number of residential construction firms went up (Somerville 1999b). Somerville's (1999b) empirical model examined residential construction firm concentration as the share of the four largest builders in each of the 49 MSA's surveyed. The research did not seek to correlate market concentration and home sales price, rather analyzed the relationship between housing market concentration and home builder activity. Other researchers looked at the relationship between concentration and sales price.

Mueller's (1995) economic theory for real estate markets contends that residential construction firms can over-estimate demand and create home sales price volatility. In a working paper, Cosman and Quintero (2017) used Mueller's overestimation frame as a basis to find a relationship between home sales price and local single-family home builder activity. Their study was limited to the Mid-Atlantic region of the U.S. and municipalities of 25,000 people or greater. From public data and proprietary data provided by Hanley Wood, Cosman and Quintero (2017) developed a theoretical economic model to find the relationship between market concentration and home sales price. Cosman and Quintero (2017) analyzed data on new home closings by firm, sale price, home characteristics and the percentage of home sales each homebuilding firm closed at the Census-defined place level. Cosman and Quintero (2017) used the Hirschman-Herfindahl Index (H.H.I.) of home building firms to determine market concentration.

The Securities Exchange Commission uses the H.H.I. to determine if a market sector has a high concentration of firms when determining fair competition or antitrust issues. To create the index, each

firm's ratio of market share is multiplied by 100, then squared, to give an index for each firm. The H.H.I. is the sum of the indexes for each firm. The index's maximum score is 10,000, the minimum is 0. In a perfectly competitive market there are a thousand firms or more with equal amounts of the market, and the H.H.I. is less than 1. In a monopoly there is one firm with 100% of the market and the H.H.I. is 10,000. In their study Cosman and Quintero (2017) found that most of the areas were moderately or highly concentrated with H.H.I.'s between 1,500 and 2,500.

Cosman and Quintero (2017) found that housing markets with higher H.H.I.'s produce less housing but had lower price volatility (year to year house price change). While markets with lower H.H.I.'s have higher vacancy rates and more price volatility (Cosman & Quintero 2017). Cosman and Quintero's (2017) working paper is the first paper to "connect the microstructure of local housing production with market dynamics and volatility."

Similar to Cosman and Quintero's (2017) research, this study seeks to understand at the MSA level the relationship between market share and home price. This study proposes an alternative way to measure market concentration, by observing a readily available statistic: the top 10 home builders' percentage of market share of new single-family detached homes sold in an MSA. This study analyzes a given MSA's top 10 home builder market share and fourteen other independent variables pertaining to local market characteristics. The study will determine if a correlation between median home sales price at the MSA level (the dependent variable) and top 10 home builder market share exists. Based on the work of Cosman and Quintero (2017), a higher concentration of market share will result in less volatility in year-to-year changes in home price. For this study the concentration of market share is measured as the percentage of home sales closed by the top 10 home builders in a given MSA market, and volatility is measured using the median home sales price.

Research Methods: Variables

In this study, data from Hanley Wood is used to analyze the relationship between top 10 home builder market share and median detached single-family home sales price. Each year, Hanley Wood's Builder Magazine releases the Local Leaders List, which includes the market share of the top 10 home builders in the top 50 U.S. housing markets. The market share of the top 10 is the total closings by the 10 most active firms' (in terms of new home closings) in each MSA divided by the total new home closings per MSA. The top 50 U.S. housing markets are determined by the total number of new home closings in each MSA. A new housing closing is counted when an owner takes full ownership of a housing unit that has no previous owners. Therefore, the market share of the top 10 includes single-family detached homes and housing units in multifamily buildings such as condos or townhomes, but homes or apartments built to be rented are not included.

The Local Leaders List tracks market share of the top 10 home builders from year to year, the first year the list was released was 2004 and the most current list is 2017. The data from Builder Magazine shows two data points: 1) the top 50 MSA's for home construction and 2) the top 10 home builders in each MSA. This study utilizes the market share of the top 10 homebuilders in nine MSAs as an independent variable to determine if there is a statistical relationship with median home sales price. Since the market concentration data is only detailed at the MSA level, the median home sales price in this study is at MSA level. This study analyzes data for nine MSA's from 2007 to 2016. Since the Hanley Wood data only tracks the top 50 MSA's in terms of new home closings, some housing markets do not appear in all years from 2007 to 2016. The nine chosen MSAs have top 10 market share data for all ten years of this study. Furthermore, the MSA's represent eight of the nine Census Divisions, important to consider when trying to understand the U.S. housing market below the national level. The populations of these MSA's totals to 70.3 million residents, roughly one-fifth the U.S. population. Table 1 shows the census division and MSAs used in this study.

Table 1: Census Division and City

Census Division	City
East North Central	Chicago/Naperville/Elgin, Ill./Ind./Wis.
Middle Atlantic	New York-Northern New Jersey-Long Island, NY-NJ-PA
Mountain	Phoenix/Mesa/Scottsdale, Ariz.
Pacific	Los Angeles-Long Beach-Santa Ana, CA
South Atlantic	Atlanta/Sandy Springs/Roswell, Ga.
South Atlantic	Washington/Arlington/Alexandria, D.C./Va./Md./W.Va.
South East Central	Nashville-Davidson--Murfreesboro--Franklin, TN Metro Area
West North Central	Minneapolis/St. Paul/Bloomington, Minn./Wis.
West South Central	Dallas-Fort Worth-Arlington, TX

The only Census Division not represented is New England because no New England MSAs remained in the top 50 active housing markets for the ten-year period. There are two representatives from the South Atlantic Census Division, Atlanta and Washington, D.C.; these two cities are included to observe the differences in the northern and southern parts of the South Atlantic Census Division.

The intention of the study is to analyze possible effects of top 10 home builder concentration on median home sales price. To focus on the relationship between Top 10 home builder and median home sales price, this work accounts for other contributing factors to home price such as labor costs in each

market, household data, housing market data, demographic data, and MSA economic data. The final 15 independent variables for this study are shown in Table 2:

Variable Name	Variable Description
Residential Construction Wages	Annual Wage in U.S. Dollars--Average of nineteen (19) Specialty Trade Contractors (Drywall, Painting, Carpentry, etc.) per MSA
Median Household Income	Median household income in each MSA in U.S. Dollars
Median Housing Structure Age	Median age (in years) of housing structure per MSA
Percent Owner Occupied Units	Percent of owner occupied units per MSA
Total Population	Total count of MSA population from Census Bureau
Gross Product	Gross Product of each MSA in U.S. Dollars from the Bureau of Economic Analysis
Housing Stock	Total count of existing homes by MSA per U.S. Census Bureau
Number of Residential Construction Firm	Total count of Firms that are Single-family Residential Construction General Contractors per MSA from Bureau of Labor and Statistics
Number of 0 Bedroom units	Total count of units with 0 bedrooms (includes all types of housing units) from Census Bureau per MSA
Number of 1 Bedroom units	Total count of units with 1 bedroom (includes all types of housing units) from Census Bureau per MSA
Number of 2 Bedroom units	Total count of units with 2 bedrooms (includes all types of housing units) from Census Bureau
Number of 3 Bedroom units	Total count of units with 3 bedrooms (includes all types of housing units) from Census Bureau per MSA
Number of 4 Bedroom units	Total count of units with 4 bedrooms (includes all types of housing units) from Census Bureau per MSA
Number of 5 or more Bedroom units	Total count of units with 5 bedrooms (includes all types of housing units) from Census Bureau per MSA
Market Share of Top 10 Builders	Percent market share of Top 10 Home Builders in each MSA
Median Home Sales Price	Median home sale price per MSA in U.S. Dollars, includes all homes, Dependent Variable

Table 2 – Variable Name and Description

The independent variable introduced with this study is the Market Share of the Top 10 Home Builders locally in each MSA. The dependent variable is median home sales price, a measure of the middle cost to purchase a home within a housing market. The median home sales price is commonly used by the National Association of Realtors (NAR) to briefly describe housing price at the city, state and national level, and median home sales price at the MSA level is tracked annually by the NAR.

Median Household Income was included to account for income variation from market to market. Accounting for the number of home builders in an MSA is the variable Number of Residential Construction Firms, which is the annual count by the Bureau of Labor and Statistics (BLS) in the Quarterly Census of Economics and Wages (QCEW) data. The QCEW measures the count of companies whose primary activity is general contracting for the construction of single-family homes.

Characteristics of the existing housing stock and housing market at-large were accounted for with certain variables. The Number of Housing Units is the total housing units in an MSA, this includes multifamily and detached rental and non-rental homes. The Median Age of Housing Stock is the year the data was taken minus the Median Year Structure Built from the 1-Year ACS data. Percent of Owner Occupied Units is the percentage of units owned by the current occupants, this includes multifamily and single-family units. Number of 0, 1, 2, 3, 4, and 5 or More Bedroom Units is the total units with zero to five or more bedrooms as counted in the Census Bureau's 1-Year ACS.

The variable Residential Construction Wages comes from BLS employment data. Hwang and Quigley (2006) used Regional Economic Information Systems (REIS) data to account for variations in construction labor costs in each city. REIS comes from the Bureau of Economic Analysis (BEA). At the time of this study

the BEA did not have REIS for the Atlanta MSA available in the years examined in this study, therefore data from the BLS QCEW is used.

The United States Office of Budget and Management assigns North American Industry Classification System (NAICS) codes to all U.S. firms based on the primary economic activity of the firm. Residential Construction Wages is calculated by totaling the number of employees at firms in the 19-NAICS codes that encompass firms active in Residential Specialty Trades. Residential Specialty Trades are considered in four categories: interiors (painting, drywall, flooring, tile/terrazzo, and finish carpentry), exteriors (concrete foundations, structural steel, framing, masonry, glass/glazing, roofing, and siding), equipment (electrical, plumbing, and HVAC), site preparation, and all other residential specialty contractors (cleaners, day laborers, etc.). The number of employees and total wages of the 19-NAICS codes are counted by the BLS at the MSA level. The variable used in the study is calculated by adding the total number of all wages and dividing by the total number of employees for each MSA.

$$\text{Residential Construction Wages} = \frac{\sum \text{total annual wages}}{\sum \text{annual average employment}}$$

Median Age of Housing was derived to create a continuous variable to control for the age of housing in each market. The Median Age of Housing is calculated by finding the MSA's Median Year Housing Constructed and subtracting it from the year the data appeared in the Census's 1-Year ACS data. The formula is:

$$\text{Median Age of Housing}_{MSA} = \text{Census Year} - \text{Median Year Housing Construction}_{MSA}$$

Home size is an important variable when considering home sales price because of increased material quantities and the associated labor. The count of zero to five or more-bedroom units is considered as a variable in this study; Mills and Simenauer (1996) also included this variable in a study on inter-regional housing characteristics and price variation.

Several influencers or potential influencers of median home sale price are also included in the model. Zahirovich-Herbert and Gibler's (2014) study concludes that new housing stock influences all home prices, therefore total existing detached single-family home stock and median home age constructed are important variables. This data is taken from the Census Bureau's 1-year ACS data. Zahirovich-Herbert and Gibler (2014) and Hwang and Quigley (2006) conducted studies that show the importance in percent owner occupied when looking at home prices. Therefore, percent owner occupied is included in this study and was also taken from the Census Bureau 1-year ACS. Median household income (Census Bureau, 1-year ACS) was a variable in of Zahirovich-Herbert and Gibler's (2014) model at the MSA level and was a part of Manning's (1986, 1989) models. Total population as counted by the Census Bureau, 1-year ACS and gross product from the Bureau of Economic Analysis for each MSA show how markets change in terms of people and production (Miller & Peng 2006). The number of single-family residential construction general contracting firms (from BLS) is also included to account for activity in the residential construction market (Somerville 1999a).

This study introduces the market share of the top 10 home builders in an MSA as an independent variable. As previously discussed, the market share of the top 10 is calculated by Hanley Wood by dividing the ten firms with the most home closings and the total home closings.

Research Methods: Modelling

After the independent variables were identified the researcher statistically analyzed relationships between the 14 independent variables, market share of the top 10 home builders, and the dependent variable, median home sales price. The result of a bivariate scatter plot shows correlation between several variables. To reduce correlation, variance inflation factors (VIF) are used to find collinearity among the independent variables. VIFs give a numbered value to the multicollinearity of each variable. Highly multicollinearity variables discovered through VIFs are removed from the model. The VIF formula is:

$$VIF(i) = \frac{1}{1 - R^2(i)}$$

Where $R^2(i)$ is the squared multiple correlation coefficient between Independent Variable i and the other independent variables. In other words, $VIF(i)$ is the R^2 value when variable i is regressed against the other variables. If the VIF is above 10 then there is a high multicollinearity. The function is run once to determine the highest collinearity variable. The variable is removed and the VIF is run again, until only the variables below the threshold of 10 remain. The variables that remain are the variables with a low multicollinearity and will be used in the next function. When the data was run through the VIF function the following variables were determined to have high multicollinearity:

- Total Population
- Gross Product
- Number of Residential Construction Firms
- Number of 1 Bedroom units
- Number of 2 Bedroom units
- Number of 3 Bedroom units
- Number of 4 Bedroom units

And the variables to be run in the next function were:

- Residential Construction Wages
- Median Household Income
- Median Age of Home
- Percent Owner Occupied
- Housing Stock
- Number of 0 Bedroom units
- Number of 5 or More Bedroom units
- Top Market Share of Top 10 Builders*

*Variable this study introduces

Table 3 shows the VIF results for the remaining eight variables:

Variable	VIF
Number of 0 Bedroom units	9.080456
Number of 5 or more Bedroom units	7.602654
Housing Stock	8.714842

Median Household Income	2.785117
Percent Owner Occupied	3.669233
Residential Construction Wages	2.133608
Market Share of Top 10 Home Builders	1.888252
Median Age of House	5.362826

Table 3: VIF Results for Eight Variables Below Threshold of 10

Next, the eight remaining variables were run through a stepwise regression. Stepwise regression is used to determine the significance of market share of the top 10 home builders. In a stepwise regression the strongest correlation between independent variables and the dependent variable are isolated, and weakly collinear variables are removed. This process is repeated, or stepped, until the highest collinear variables remain. A stepwise regression finds the most relevant variables to the dependent variable. Table 4 shows the results of the stepwise regression for each MSA, Percent Owner Occupied and Residential Construction Wages.

Variable Name	Estimate	Standard Error	t value	Pr(> t)
Atlanta (Intercept)	7.10E+05	2.32E+05	-3.065	0.002979
Chicago	3.65E+04	1.96E+04	1.865	0.065881
Dallas	6.08E+04	2.13E+04	2.862	0.005389
Los Angeles	4.09E+05	4.75E+04	8.622	5.33E-13
Minneapolis	8.73E+03	2.42E+04	0.36	0.719451
Nashville	3.97E+04	1.82E+04	2.183	0.032012
New York City	3.47E+05	3.76E+04	9.218	3.65E-14
Phoenix	6.92E+04	1.94E+04	3.572	0.000608
Washington	2.01E+05	1.87E+04	10.708	2.00E-16
Percent Owner Occupied	8.62E+05	2.77E+05	3.115	0.002561
Residential Construction Wages	6.90E+00	1.65E+00	4.188	7.26E-05

Table 4: Stepwise Regression Results.

The stepwise regression found two variables with positive collinearity to median sales price. The variables were: Percent of Owner Occupied Units and Residential Construction Wages. Meaning that as

percent of owner occupied units increase so does median home sales price. Likewise, as residential construction wages increase so does median home sales price. A strong correlation between the cost of labor and median home sale price could have been expected. High residential construction labor rates are tied to certain markets, and a more expensive labor market would result in a more expensive housing market. Hwang and Quigley (2006) recognized that owner occupancy rates are the result of numerous local policies, so the owner-occupancy rate could be linked to median home sales price in that regard.

Market Share of the Top 10 Home Builders does not appear to be significant. So, a linear regression was calculated between the market share of top 10 home builders, and the dependent variable—median home sales price. This linear regression leads to the conclusion that there is no statistical relationship between market share of the top 10 home builders and the median home sales price in any of the 9 MSA’s studied. Table 5 shows the results of the linear regression.

	Df	Sum Sq	Mean Sq	F Value	Pr(>F)
Market Share of Top 10	1	2.93E+10	2.93E+10	2.4297	0.1226
Residuals	88	1.06E+12	1.21E+10		

Table 5: Linear Regression Results of Top 10 Market Share – Dependent Variable Median Home Sales Price

Conclusion/Implications

The modelling processes in this work indicate that percent of owner occupied units and residential construction wages are colinear to an increase in median home sales price and that the top 10 market share is not correlated with median home sales price. The hypothesis, that an increase in market share results in a decrease in median home sales price volatility, is not held to be true at the MSA level, as there is no statistical relationship. However, this study has its limitations and future studies could expound upon the results.

The first limitation is the sample size of the MSAs studied. To have conclusive results in a statistical analysis there should be at least thirty samples to compare. Including more MSAs in the study would

increase the reliability of future studies. In the data from Hanley Wood, there are 34 MSAs that in which the market share of the top 10 is known for the years 2007 to 2016. And even more MSAs would be available if the window is adjusted for a shorter period of time. The scope of the study was limited intentionally to allow for a deeper understanding of the market areas if a statistical relationship was found.

The second limitation of the study is the granularity of the study. The MSA may not be the perfect spatial unit to accurately study the median home sales price. MSAs vary greatly in sizes and the ones included in this study are all MSAs with millions of people, homes and acres. Areas within an MSA could experience fluctuations in median home sales price related to the market share of the top 10, but the median home sales price in the MSA may remain quite stable because of the small share of homes affected. A more detailed level of granularity within an MSA, at say the census tract level, may allow researchers to view changes in median sales price in a smaller universe. Changes in median sales price in a smaller universe could be tied to changes in market share of the top 10 home builders.

Lastly, median home sales price may not be an accurate proxy for the cost of housing. Median home sales price is commonly used by the real estate profession and potential home buyers to assess housing markets. A dependent variable that more precisely depicts changes in home prices may reveal more correlation with home price and top 10 home builder activity. A future study could observe top 10 market share's effect on prescribed ranges of home sales price, or number of homes available in a certain price range. Also, the dependent variable does not separate median home sales price from median *new* home sales price. The difference between existing and new home sales price could be the focus of a future study.

The conclusion that there is no statistical relationship between market share of the top 10 home builders and median home sales price may be explained by how home builders operate. Market share concentration of the housing market, measured by percentage of home closings by the top 10, it appears is a poor indicator of median home price within this study. Within an MSA however, large home builders may

construct houses with an expected price range in mind to meet consumer expectations. Haughwout et al., (2013) observed no changes in the new home premium from 1989 to 2005. The top 10 home builders may respond to home buyer price concerns by keeping prices low, and as a result do not impact median home sale price.

There are many possible studies from the data collected that could help find primary drivers on home price in the U.S. A future study could build on this research by examining top 10 home builder activity in multiple census tracts within a single MSA. Analyzing specific regions in an MSA where the top 10 home builders are more active could help understand more specific impacts to home price. Also, analyzing numerous MSAs within a Census Division could show differences or similarities in regional housing markets. Both approaches could look at “boom times”, periods of high home closings, and the relationship of the market share of the top 10 during those times. To more fully understand the impact of the local market share of top 10 home builders, future research needs to be conducted.

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