
PRICING FACTORS IN THE ARIZONA HOME MARKET

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ABSTRACT

In the following statistical analysis research paper, the Arizona home market is investigated in order to determine 1) the viability of home ownership in Arizona and 2) the most significant factors influencing the price of a single family home. In order to determine the viability of home ownership, the cost of owning a home in Arizona is compared to the cost of home ownership nationally. By analyzing historical price appreciation in conjunction with socioeconomic factors - school districts, location, crime, et al. - the most significant factors influencing housing cost are determined. Ultimately, this research paper serves to provide an analytical guide to assist future Arizona home buyers determine what factors are most important to consider when buying a home.

1 Introduction

As demand continues to grow and the supply of affordable housing stagnates, an increasing amount of housing markets will become unrealistic for the common home buyer. Such a dilemma is especially present in home markets where the supply of housing is limited due to geographic or density constraints. Indeed, as stated by Wall Street Journal correspondents Laura Kusisto and Peter Grant, "cities around the world, from New York to London to Stockholm to Sydney, are struggling to solve growing affordable housing crises" [2]. Even in cities where wage growth is strong, such as in San Francisco with the opulent tech industry, supply may be too limited or costs too high: "Restricted housing supply, growing demand and wealth will mean that the minimum price to buy any home in San Francisco's most desirable neighborhoods, like Pacific Heights, Russian Hill and Cow Hollow, in five years will be \$1 million" [7].

As living in a city becomes increasingly infeasible, housing markets with a high degree of affordability and suburban growth become more appealing. Two such housing markets known for their suburban sprawl and inexpensive housing costs are Phoenix and Tucson, Arizona. Given their practicality, the remainder of this research paper will focus on exploring the characteristics of each market, determining the best places to live within the two cities and drawing conclusions upon what factors most influence the price of an Arizonan home.

2 Materials and Methods

The cost of home ownership is illustrated by analyzing data provided by Zillow Real Estate, an online real estate database company that provides the most current and comprehensive housing data. Throughout the research paper, data provided by Zillow Real Estate is investigated in order to ascertain the affordability, appreciation and value of national home markets.

Perhaps the most significant metric within the Zillow data set is the Zillow Home Value Index (ZHVI), or an accurate and timely metric used to measure residential real estate prices. Integrating information from many different sources - prior sales, county records, tax assessments, real estate listings, mortgage information and GIS data - the Zillow Home Value Index aims to provide an estimated value for each home market. Instead of relying on biased approaches, such as measuring repeat sales history, the ZHVI provides a straight forward evaluation and requires no convoluted models to correct for inherent biases. The ZHVI is used extensively throughout the paper to compare and contrast the cost of home ownership in the United States.

In addition to utilizing the ZHVI to illustrate real estate markets, various socioeconomic factors are investigated to determine the overall quality of a home market. By investigating additional open source data sets, the local crime rate, educational standard and location quality are all successfully calculated. Crime, for example, is measured by analyzing crime data provided by the Federal Bureau of Investigation, who offers an open source database to access all uniform crime reporting statistics. Quality of education, on the other hand, is measured according to the quality of the school district, where the Arizona Department of Education provides relevant test scores and a comprehensive analysis of public schools within Arizona. Finally, location value is based on a combination of all previous factors, where high home value, low crime rate and a highly rated school district equates to a premium location value.

3 Results

Perhaps the most appealing trait of the Arizona home market is affordability. When compared to the average national median value of a home, the cost of a home in Arizona is practically identical. To be sure, the value of a home in Arizona has remained in line with the national value of a home for much of the last twenty years, with the exception of the few years prior to, during and shortly after the Great Recession. Figure 1 on the following page illustrates Arizona's home value over the last two decades in conjunction with the national home value.

Recently, the Arizona home market has become moderately more expensive than the national average. For the first two months of 2019 (where data is thus far available), Arizona ranks as the 36th state in terms of highest home value, where rank 50 is the most expensive home market. See Figure 2 on the following page for a comprehensive ranking list.

In terms of population and price, Arizona maintains a favorable balance, where it is ranked as the 16th most populous state and the 36th most expensive home market. Such a balance demonstrates Arizona's ability to support a strong economy with a large population yet maintain an affordable housing stock. Figure 3 on page 4 provides a detailed overview of each state's size and price ranking.

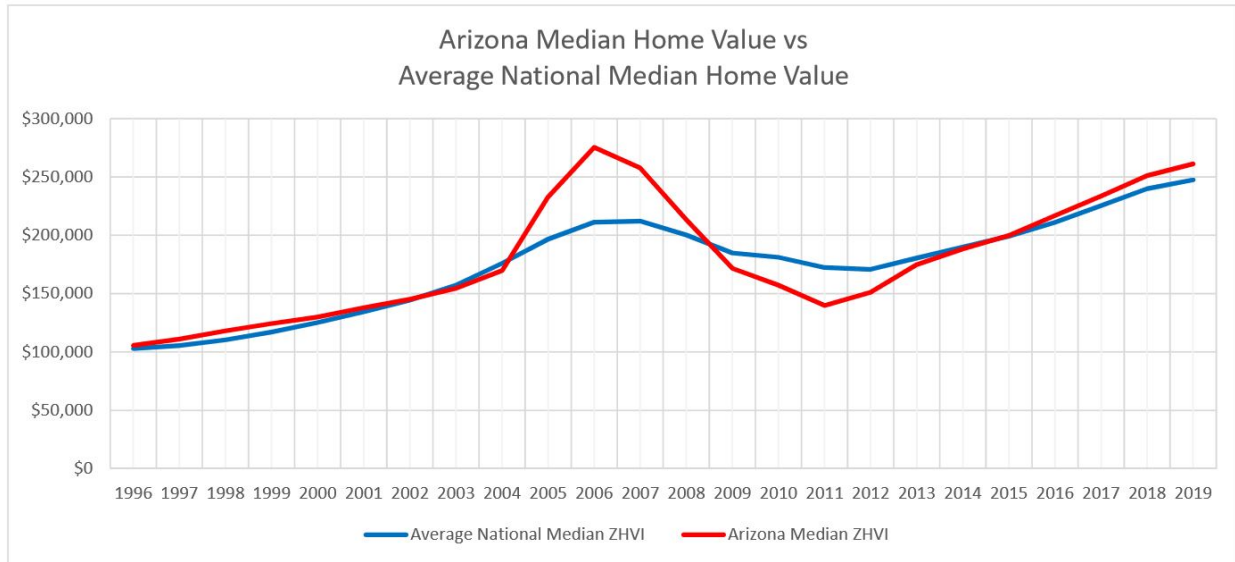


Figure 1: Two decade analysis of Arizona and national home values

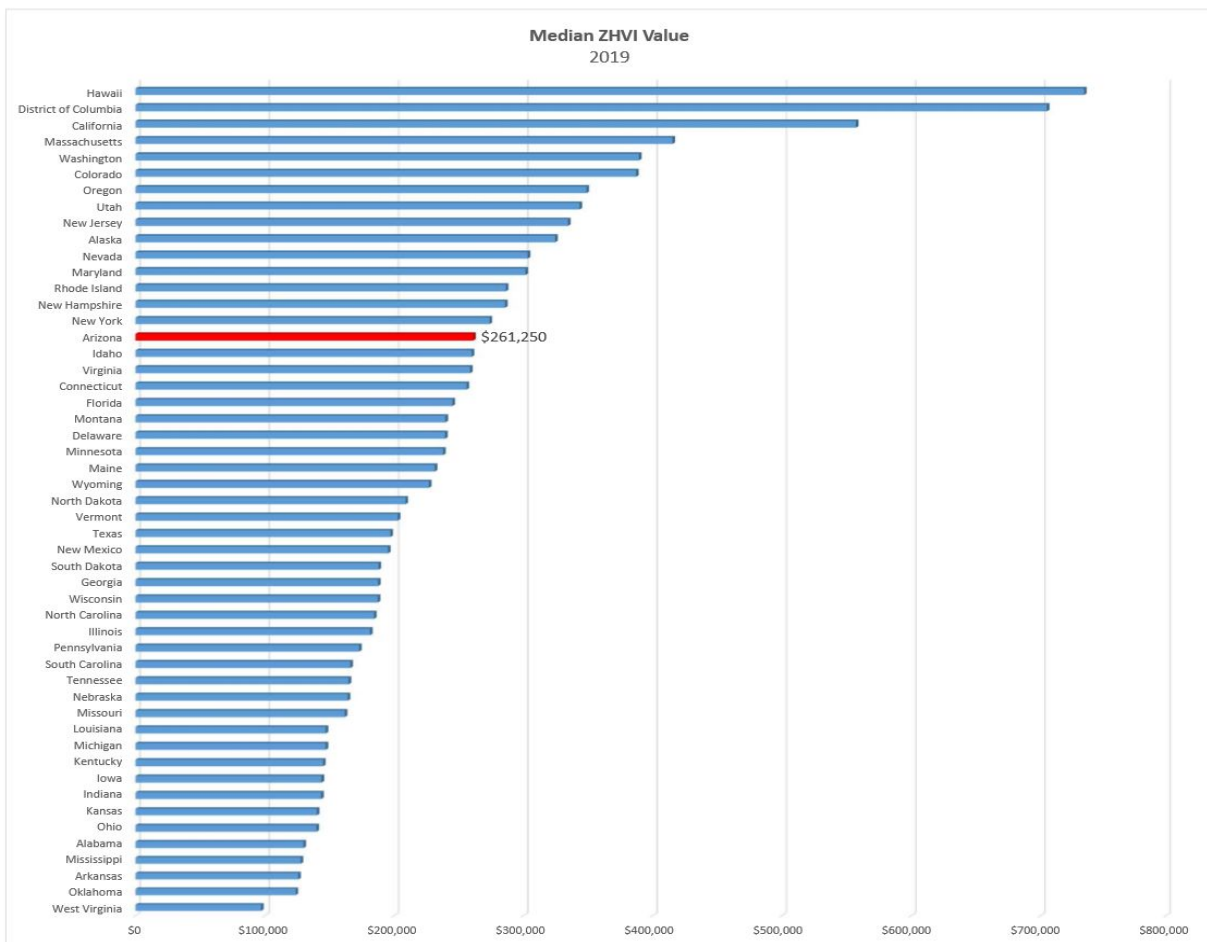


Figure 2: National 2019 ZHVI values

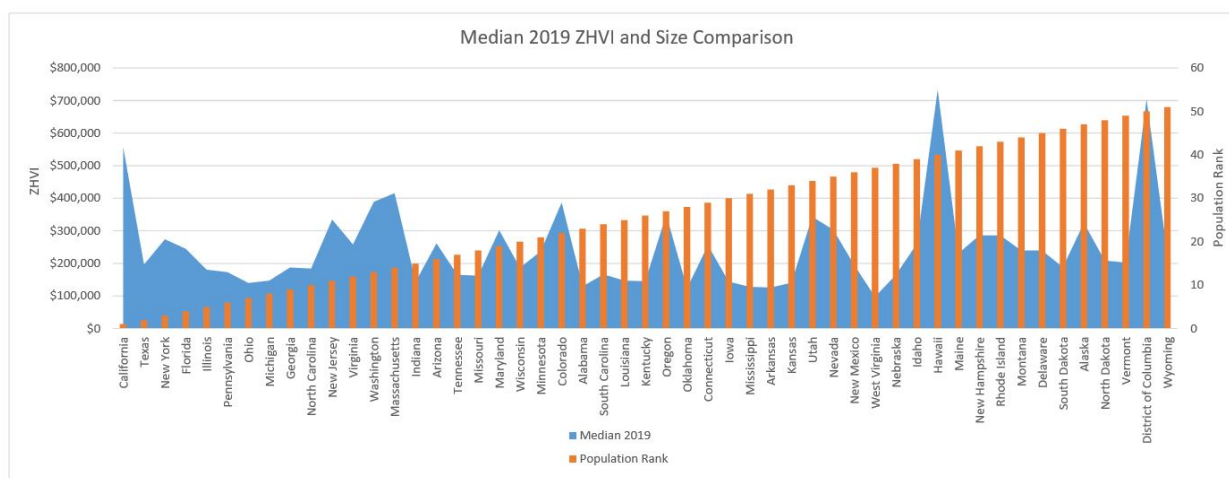


Figure 3: Population and Home Values per State

In terms of home market pricing factors, population size is a poor indicator. Indeed, the top three priciest home markets are scattered across the population scale, where California is the third most expensive home market (1st largest in terms of population), Washington, D.C. the second most expensive (50th largest in terms of population) and Hawaii the most expensive home market (40th largest in terms of population) in the United States. When analyzed in conjunction with home prices, population and pricing have a low R-squared value (0.013), a high p-value (0.43) and a low correlation (0.11). See the figure below for an illustration of national home value in terms of state population rank.

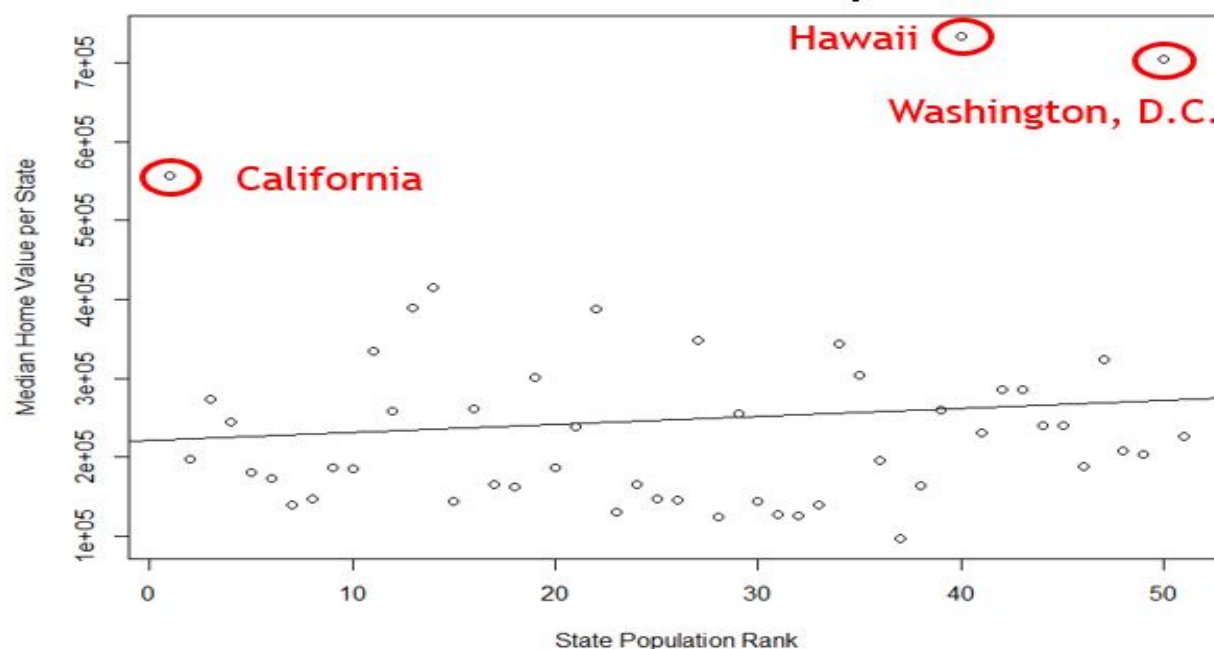


Figure 4: Home Values and Population Rank Per State

Unlike population rank, a state's education proficiency is perhaps the best indicator for home value. Specifically, a high proficiency in English was the most statistically significant variable in terms of correlation with Arizona home value. Using data from the Arizona Department of Education, each county in Arizona was analyzed in terms of their English and Math proficiency (as demonstrated by test scores) alongside their home market value. More so than Mathematics, high scores in English in Arizona correspond to higher neighborhood home values.

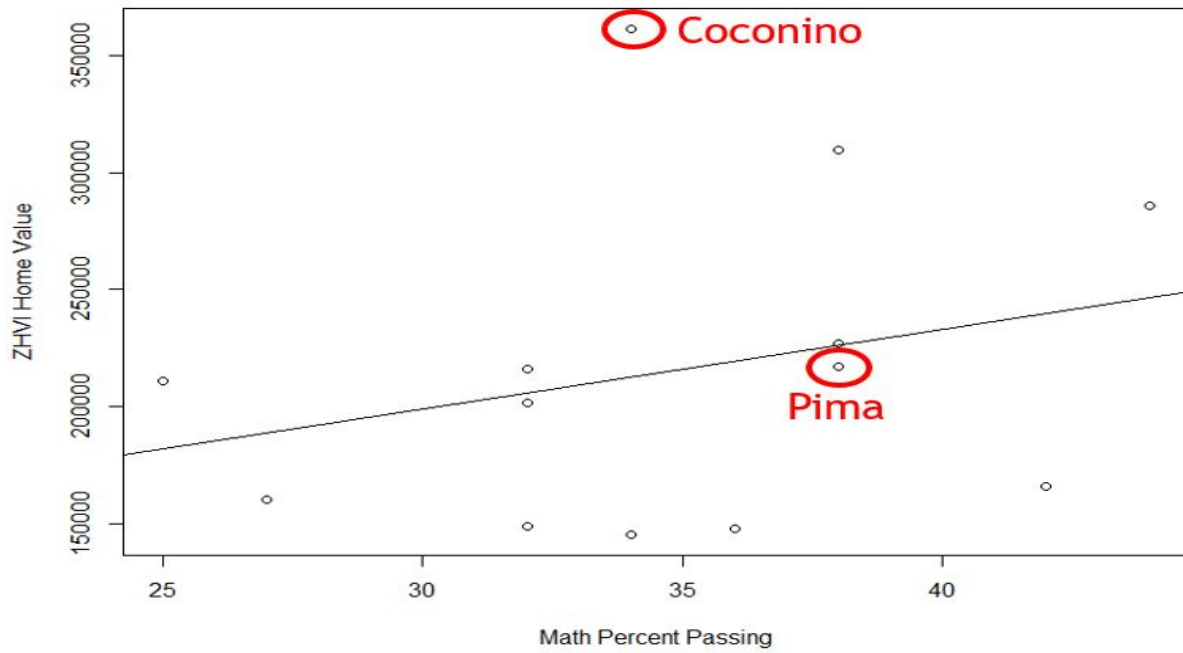


Figure 5: County Home Values and Math Proficiency in Arizona

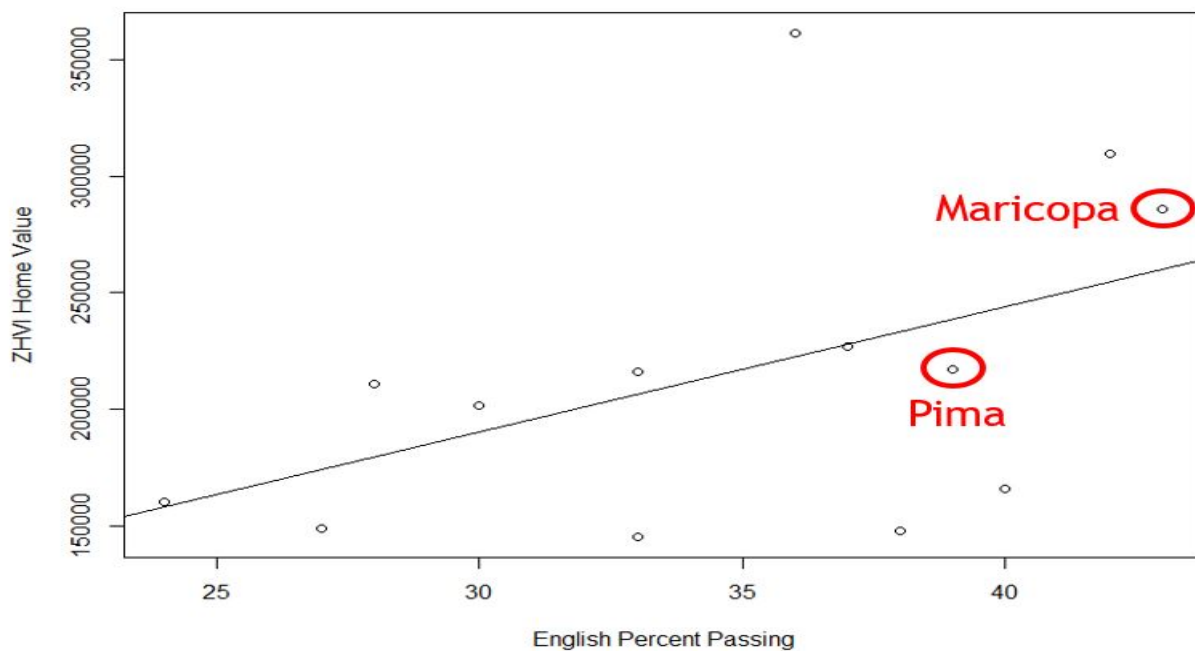


Figure 6: County Home Values and English Proficiency in Arizona

In addition to the quality of schools, crime also plays a role in determining a home market's value. Nationally, violent crime and a state's home value have a 0.28 correlation, where high value home markets cluster around a lower crime rate. A few exceptions exist, however, as Washington, D.C. and Hawaii are both expensive home markets with a high crime rate. To be sure, the quality of education is a better indicator of home value than crime rate, as demonstrated in the table below.

Pricing Factors	Correlation	R-squared	P Value
Population Size	0.11	0.01	0.43
Math Proficiency	0.27	0.07	0.37
English Proficiency	0.47	0.23	0.09
Violent Crime	0.28	0.08	0.05
Property Crime	0.25	0.06	0.07

Figure 7: Home Value Pricing Factors

While not as significant as education quality, crime rates remain an important factor in setting a market's home value. Figure 8 below and Figure 9 on the following page illustrate the relationship between a state's home value and a state's crime rate on the national scale.

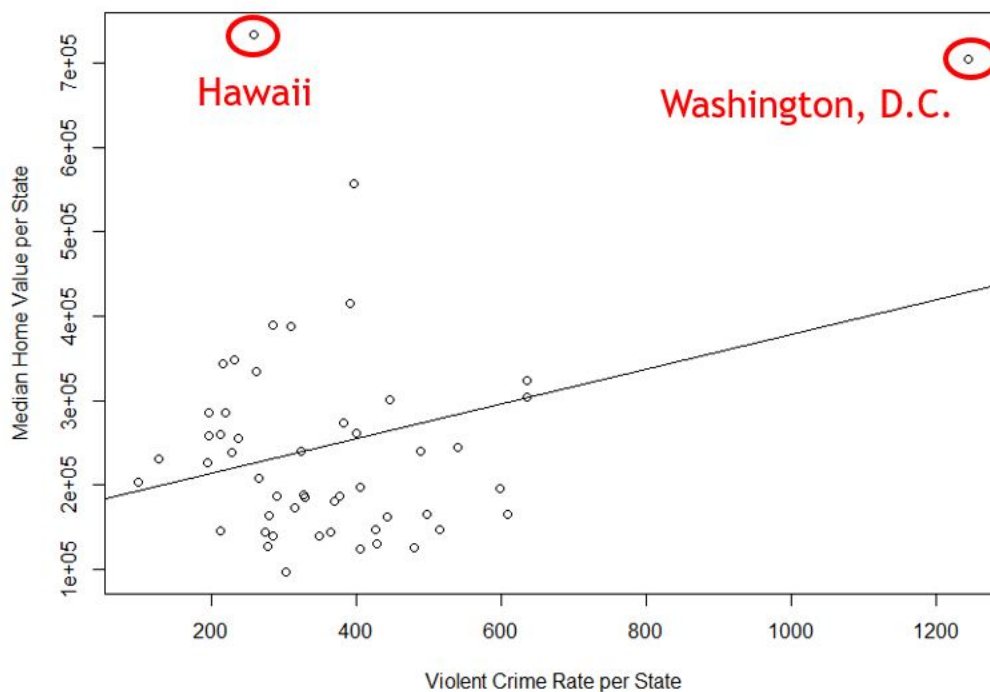


Figure 8: National Home Values and Violent Crime Rate

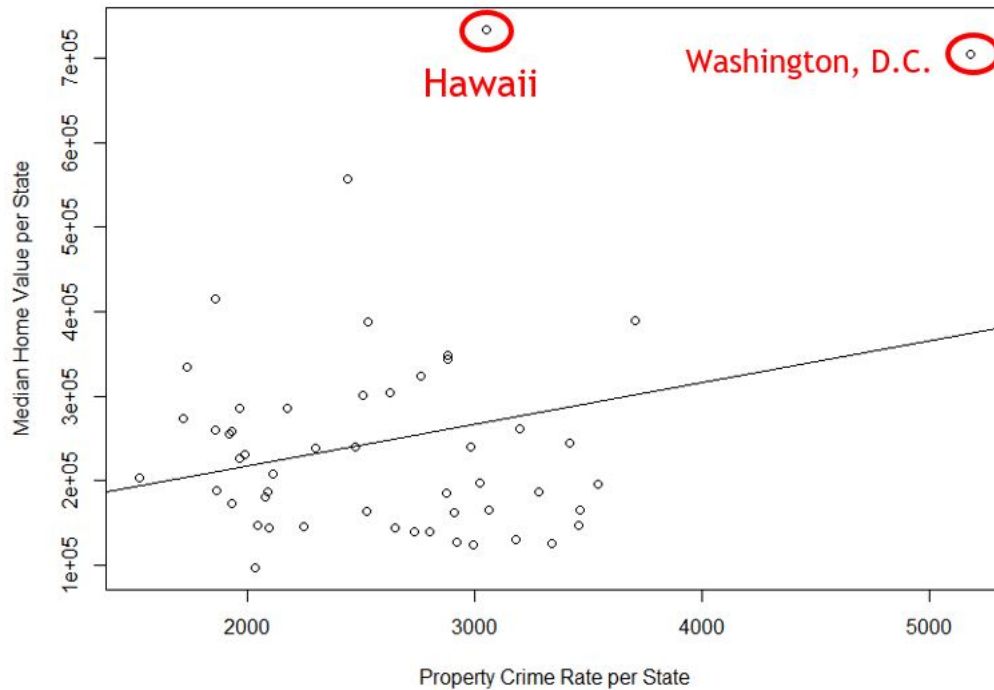


Figure 9: National Home Values and Property Crime Rate

4 Discussion

From the initial summary of the data it can be deduced that Arizona offers both an affordable housing market and a strong economy. With a sizable population and large supply of housing, Arizona offers a practical housing market that is likely to remain affordable for years to come. In terms of pricing factors, the most valuable homes in Arizona all share a low crime rate and a high quality school district. Given the results of the above statistical analysis, Arizona home buyers should pursue low crime neighborhoods where students score high in English proficiency tests. In doing so, Arizona home buyers are likely to derive the most value from their home.

References

- [1] JACKSON, B. Greatschools: School ratings & reviews for public & private schools, 2019. Last accessed 25 April 2019.
- [2] LAURA KUSISTO, P. G. Affordable housing crisis spreads throughout world. *The Wall Street Journal* (2019).
- [3] OF EDUCATION, A. D. Accountability and research, 2019. Last accessed 25 April 2019.
- [4] OF JUSTICE, U. D. Uniform crime reporting statistics, 2019. Last accessed 25 April 2019.
- [5] RICHARD BARTON, L. F. Trulia: Real estate listings, homes for sale, housing data, 2019. Last accessed 25 April 2019.
- [6] RICHARD BARTON, L. F. Zillow: Real estate, apartments, mortgages & home values, 2019. Last accessed 25 April 2019.
- [7] YOREE KOH, R. W. The ipo millionaires are coming! *The Wall Street Journal* (2019).

[5] [6] [1] [4] [3] [2] [7]