

# **South bay area house price analysis and investment recommendation**

## **1.1 Introduction**

In the past few years, San Francisco south bay area, with another name "Silicon Valley", has double digit house price growth rate. With its already expensive housing price, it has topped United States as one of the most expensive regions. On the other side, after dot\_com bubble burst in 2000, high tech companies such as Apple, Google, Facebook and etc whose headquarters located in Silicon Valley have immense growth, and created tons of work opportunities, and their high salary and outstanding benefit systems attracted candidates all over the world to swarm into this area, and keep pushing house price higher and higher.

## **1.2 Business problem**

Whether it is still a good time to invest in real estate in Silicon Valley is a valuable and realistic question to answer. A major cause of high housing costs in the Silicon Valley is expansive job growth without adequate housing production. In 2018, close to 36,000 new jobs were created in the area (34% of which were tech jobs); only 8,400 new residential units were issued permits. Imbalanced demand and supply relationship in the housing market suggested potential good investment return from new house construction or remodeling of existed houses. However, as construction permit approval normally takes couple of years. While with background of COVID-19 and emerging working from home, there is uncertainty that whether the economy will continue its trajectory and the evolution of house supply-demand relationship. Before pouring millions and billions of dollars in house market investment, It is necessary to do detailed analysis and house price prediction to understand whether it is still a good time to invest in South Bay Area housing. In addition, significant house price difference from different cities/ neighborhoods is observed. Which area is most promising for investment also worth a thorough data analysis.

## **1.3 Target and audience**

The problem mentioned above is applicable to investors who want to invest in Silicon Valley housing and real estate, as well as young engineers and scientists who just moved to Silicon Valley and are trying to make decision whether to buy their house from Silicon Valley and which location to choose.

## **1.3 Data and analysis approach**

1.3.1 General trend analysis of big tech company performance and growth potential in the coming years from Yahoo Finance. <https://finance.yahoo.com>

As growth of economy and booming of internet of things is the driving force of job opportunities in silicon valley, it is necessary to analyze whether there is strong correlation of stock market performance from S&P500, Dow Jones and Nasdaq and house price growth from whole country and from silicon valley. Monthly stock price for open, close, high, low are included in the datasheet, but we will only extract the monthly stock price at close and normalize them based on Jan. 1999 stock price to calculate the growth rate. Linear regression will be used to project stock market

performance in the following couple years. The result and correlation with house price will be used to forecast house price growth in the near future.

### 1.3.2. Bay area supply demand analysis

[https://www.huduser.gov/portal/ushmc/hd\\_home\\_sales.html](https://www.huduser.gov/portal/ushmc/hd_home_sales.html)

With US total housing supply and demand data, we can analyze whether the gap between demand and supply will be reduced. 'Manufactured monthly' and 'sale monthly' data will be extracted as features and used to calculate supply and demand relation.

### 1.3.3 Comparison of cities and neighborhoods for investment opportunities

Local house prices have several determining factors: 1. Whether the neighborhoods have good school resources for the kids. 2. Whether the location is convenient for life and work commute. To assess which factor is the dominating factor, and whether this factor can withstand economic cycles, we will use Foursquare exploration and search functions to compare nearby schools, restaurants and high tech companies. In addition, as employees from giant tech companies tend to live in the same city of their office buildings, there is close relation between house price and the performance of those companies. For example, there could be correlation between Apple company performance and Cupertino house price, and Google performance and Mountain view house price. We will analyze several high tech companies' performance for the following years based on linear regression, and finally propose which city to invest in real estate.

California school table will be used to extract the following features:

- City name
- Zipcode
- Latitude
- Longitude

## Reference

US housing supply and demand

[https://www.huduser.gov/portal/ushmc/hd\\_home\\_sales.html](https://www.huduser.gov/portal/ushmc/hd_home_sales.html)

S&P 500, Dow Jones, Nasdaq YOY growth rate for the past 20 years

<https://finance.yahoo.com>

Fed rate for lending

<https://www.macrotrends.net/2015/fed-funds-rate-historical-chart>

Redfin median house price growth in Silicon Valley

<https://www.redfin.com/news/data-center/>

Affordable housing in the Silicon Valley

[https://en.wikipedia.org/wiki/Affordable\\_housing\\_in\\_the\\_Silicon\\_Valley](https://en.wikipedia.org/wiki/Affordable_housing_in_the_Silicon_Valley)