

# Analysis of Zip Code Returns



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# Agenda

1. Problem
2. Business and Data Understanding
3. Modeling Criteria
4. Modeling
5. Forecasts
6. Recommendations
7. Limitations

# Problem

For the investment firm, what are the top 5 zip codes to invest in?

Out of the top 5, which zip codes will yield positive return on investment (ROI) within tolerable risk (sharpe ratio).

This analysis seeks to:

1. **Identify** the top 5 zip codes to invest in.
2. **Forecast** an investment horizon of 3 years to extrapolate the best zip codes to invest in for managers at the real estate investment company.

# Business and Data Understanding

The data:

- Zillow.com dataset of 14,723 zip codes in the United States
- Monthly data of housing prices across each zip code, along with size rank.

# Modeling Criteria

## 1. Size Rank: zip code must be in the top 50 size rank.

Larger size accounts for qualitative factors such as job opportunities, population, and other drivers of demand that fall outside the scope of this model

## 2. Return on Investment

Measures return relative to cost of the investment

## 3. Sharpe Ratio

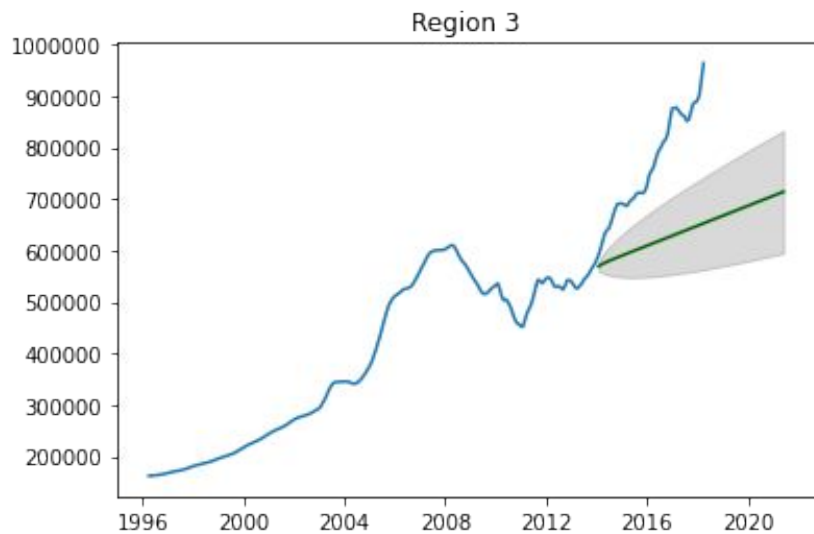
Measures the risk adjusted return of an investment

# Modeling

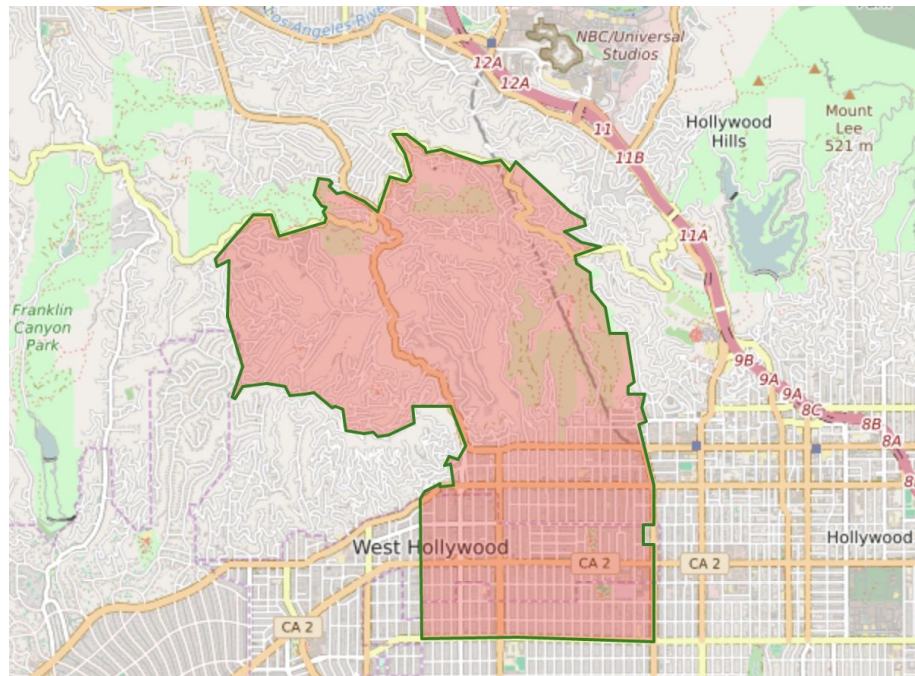
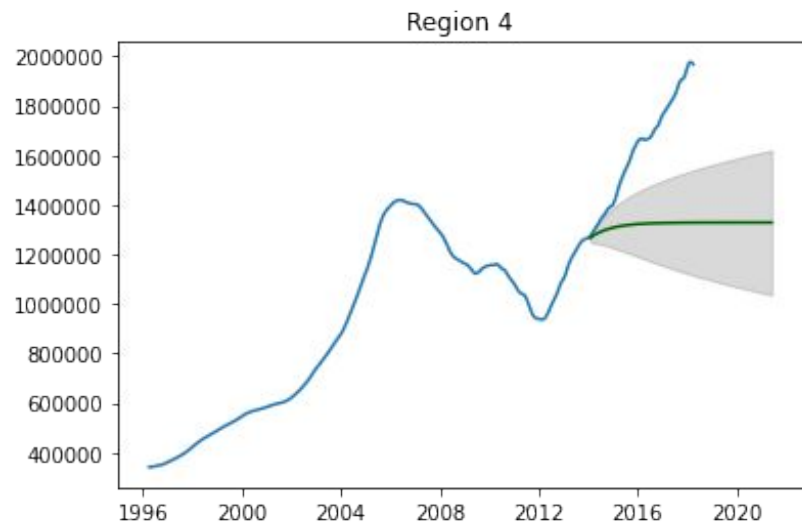
Sampled the top 50 zip codes according to size rank

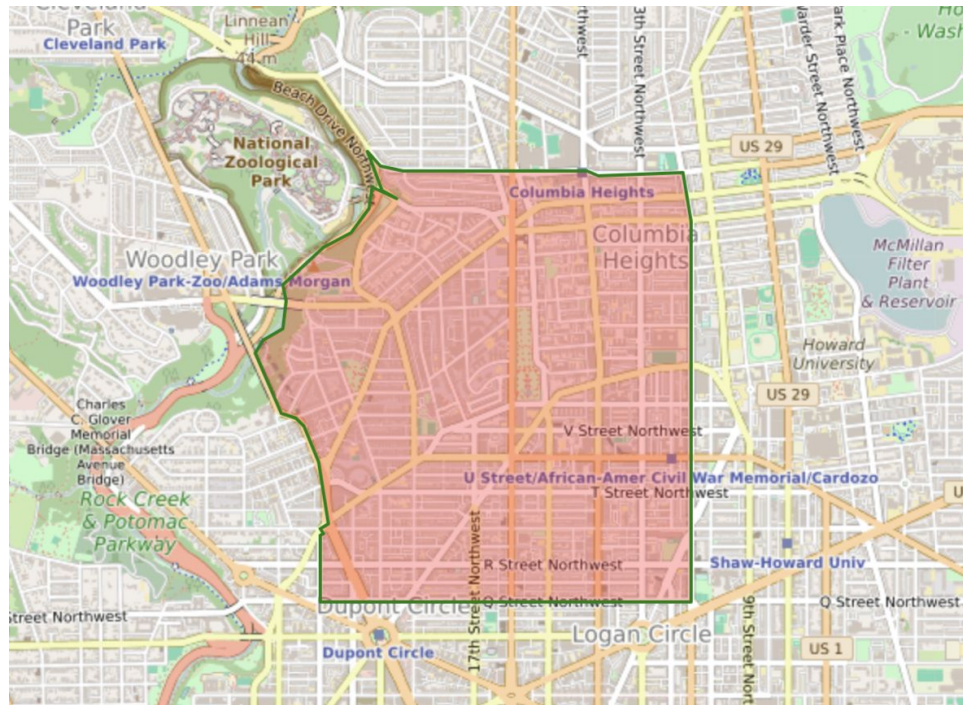
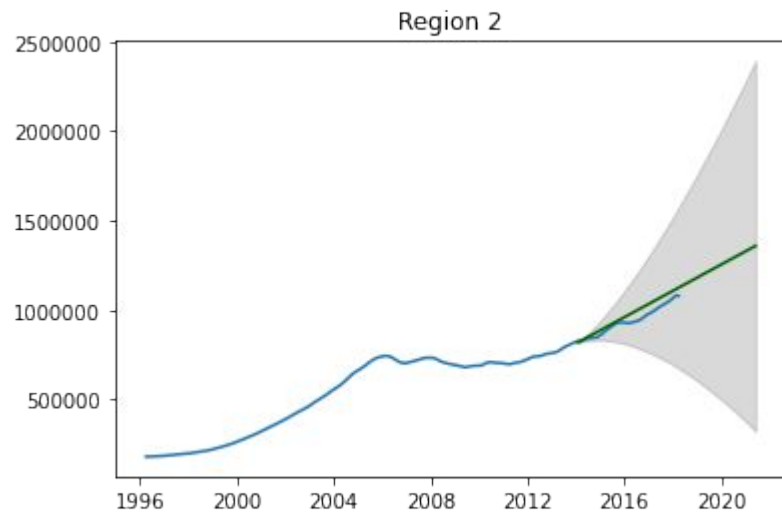
- Calculated ROI in each zip code over the historical period
- Revealed the top 5 Zip codes:
  - a. **“Region 1”** → 66126: Washington DC
  - b. **“Region 2”** → 66133: Washington DC
  - c. **“Region 3”** → 62037: Kings County, New York
  - d. **“Region 4”** → 96027: Long Beach/Anaheim, California
  - e. **“Region 5”** → 62040: Kings County, New York

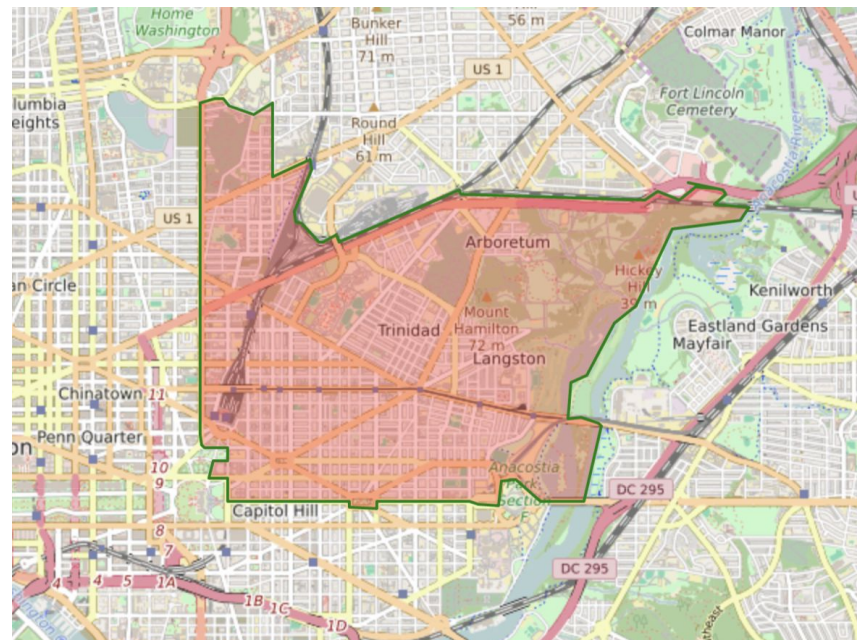
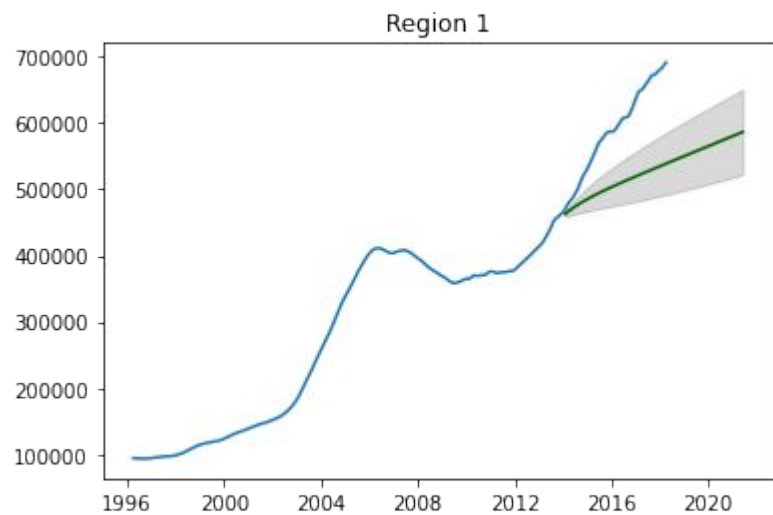
# AutoArima Forecasts





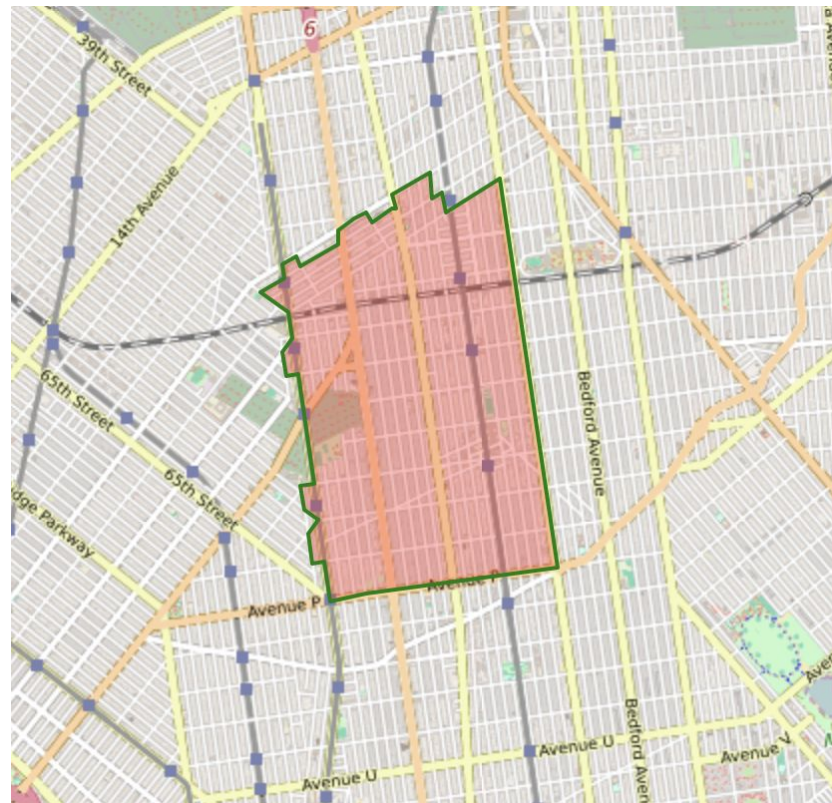
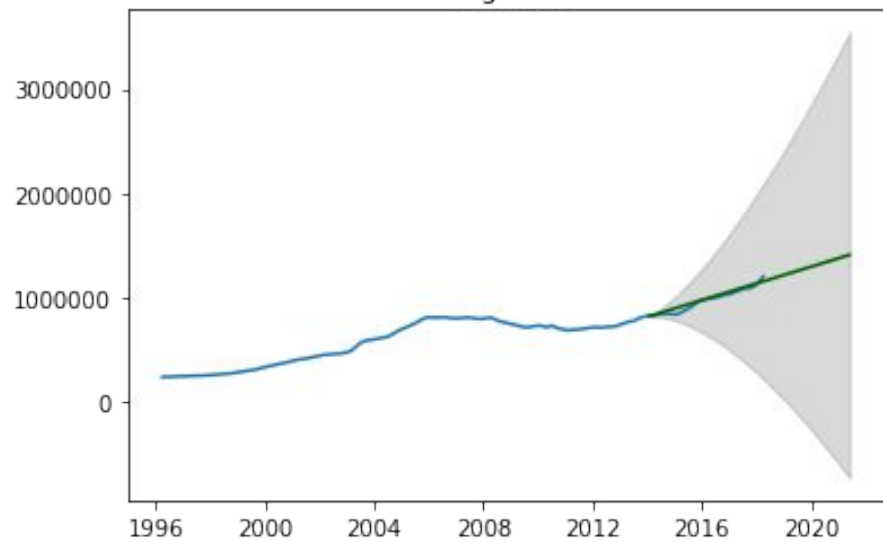








Region 5



# Return on Investment and Sharpe Ratio

ROI and Sharpe ratio metrics show which zip codes will have the best risk-adjusted returns:

## Return on Investment

r1	0.267562
r2	0.660585
r3	0.254082
r4	0.048675
r5	0.722815

## Sharpe Ratio

r1	343.902019
r2	745.895115
r3	719.283959
r4	24.000569
r5	711.097921

# Recommendation

Analyzing the forecasted ROI and sharpe ratio, I recommend to the firm:

- 1. Invest in region 1, 2, 3, and 5.**
- 2. Do not invest in region 4**

Regions 1, 2, 3, and 5 forecast ROI with efficient risk adjusted return. However, region 4 does not provide efficient risk adjusted return. Moreover, region 4 showed the lowest return on investment over the forecasted period.

# Recommendations

The regions selected share certain characteristics that yield attractive risk adjusted return. Each zip code is from a **Tier 1 or 2 city**. These cities (New York, Los Angeles, Washington DC) share the characteristics of:

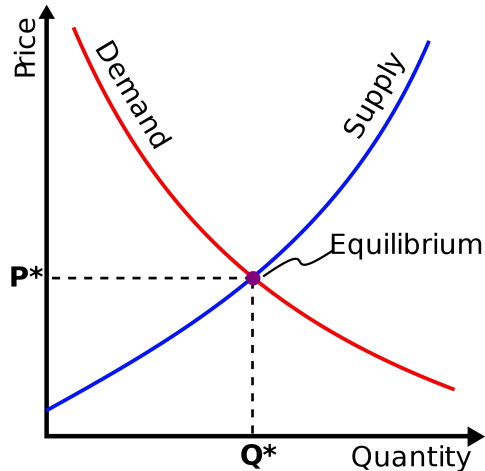
1. **Healthy employment and strong economics** anchored by the higher than usual opportunity in these high tier cities. In fact, regions 1, 2, 3, and 5 all have unemployment rates at or below 6%. For example, regions 1 and 2 neighbor Capitol Hill.
2. **Proximity to amenities** such as parks, entertainment, or transit.
3. **Population growth** fueling housing demand.

Therefore, I also recommend that **future investment consideration adheres to these characteristics**. Together, they create strong demand that results in efficient ROI. Further analysis that uses employment, income growth, and population growth may reveal other lucrative zip codes.

# Limitations

Real estate prices are not just a function of time, but a relationship between supply and demand not fully captured by this analysis.

Including exogenous variables: interest rates, housing supply, population growth





# Questions