Forecasting real estate prices

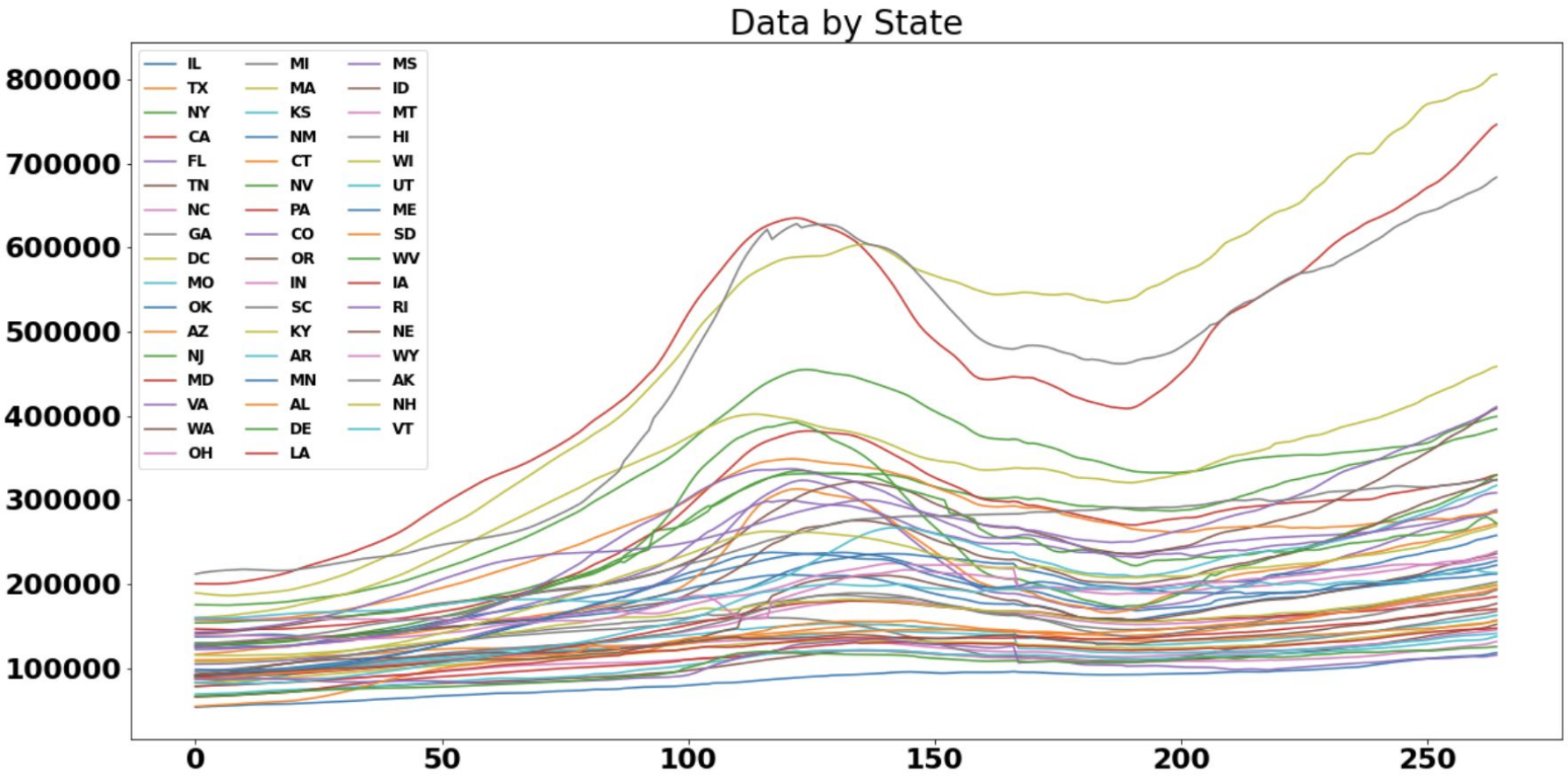
By Dariga Kokenova

Data overview:

Source: Zillow Research

Data volume: 3,901,595 monthly observations for 50 states + Washington DC

Range of Time: 1996/04/01 - 2018/04/01

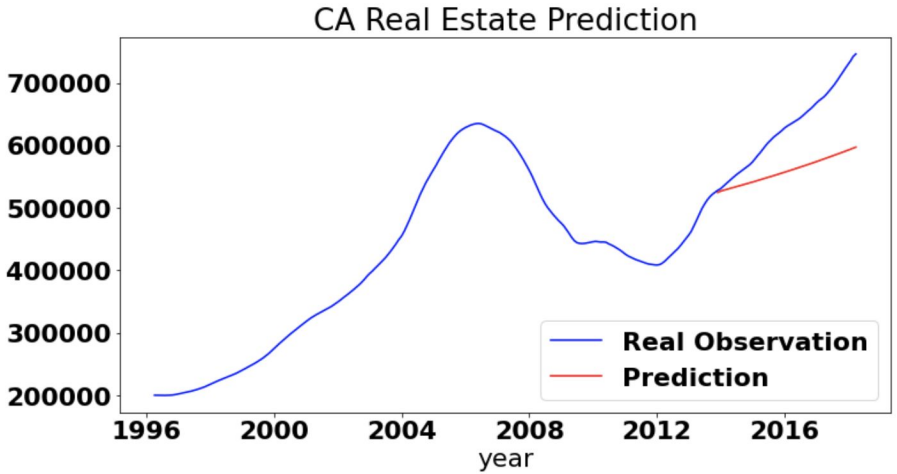

Data by State
IL
TX
NY
CA
FL
TN
NC
GA
DC
MO
OK
AZ
NJ
MD
VA
WA
OH
MI
MA
KS
NM
CT
NV
PA
CO
OR
IN
SC
KY
AR
MN
AL
DE
LA
MS
ID
MT
HI
WI
UT
ME
SD
WV
IA
RI
NE
WY
AK
NH
VT
800000
700000
600000
500000
400000
300000
200000
100000
0
50
100
150
200
250

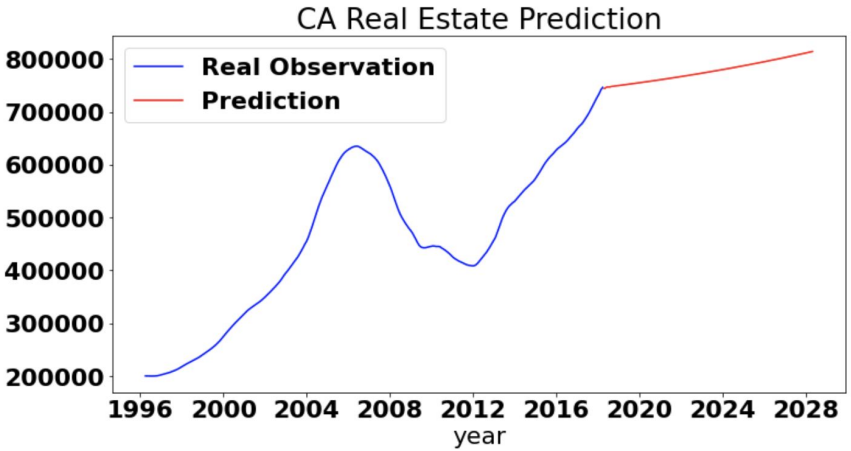
States: California, New York, Texas

What are the best states to invest in?

CA: ARIMA(order=3,1,2)

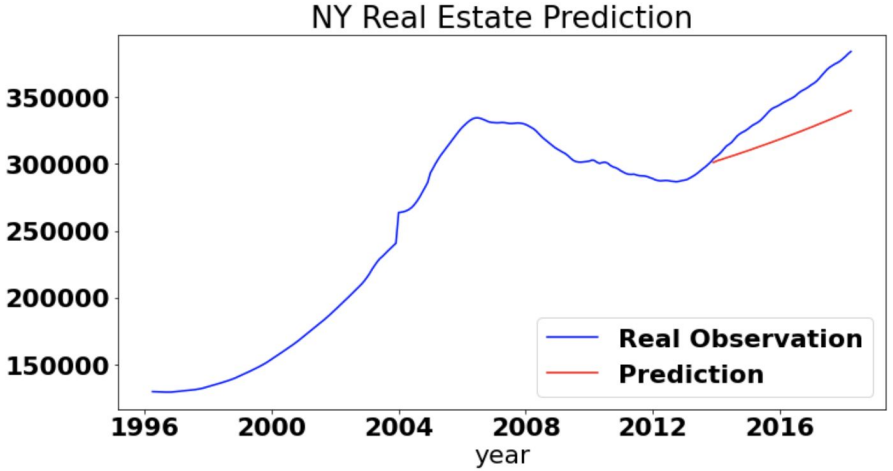
In train-test split analysis, CA prediction was underestimated by 28.42%.

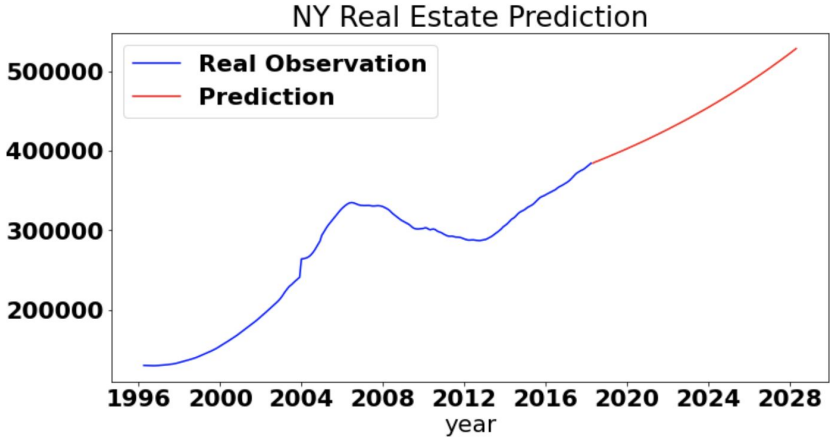




NY: ARIMA(order=0,1,2)

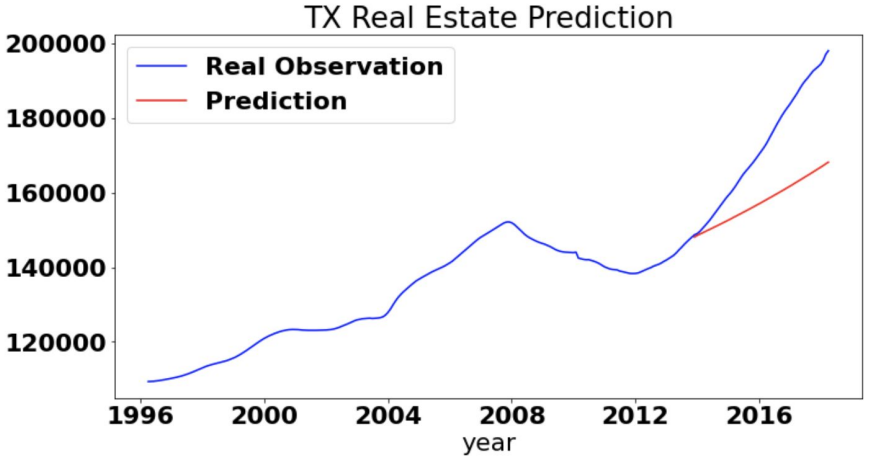
In train-test split analysis, NY prediction was underestimated by 14.64%.

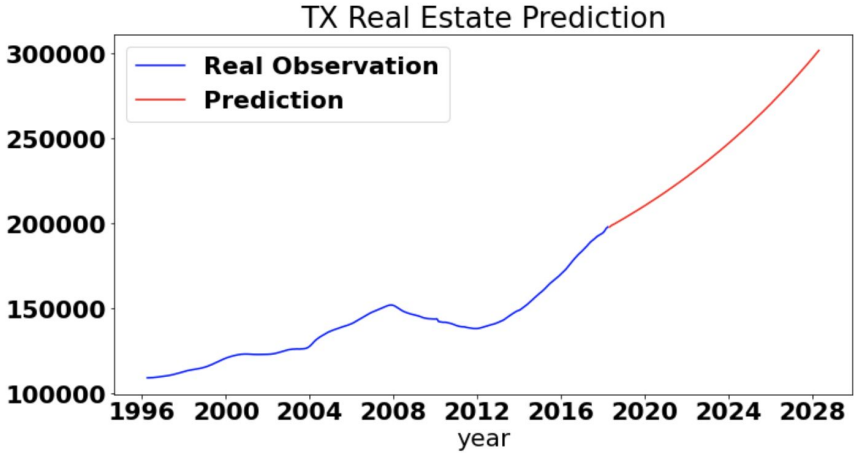




TX: ARIMA(order=1,1,1)

In train-test split analysis, TX prediction was underestimated by 20.17%.



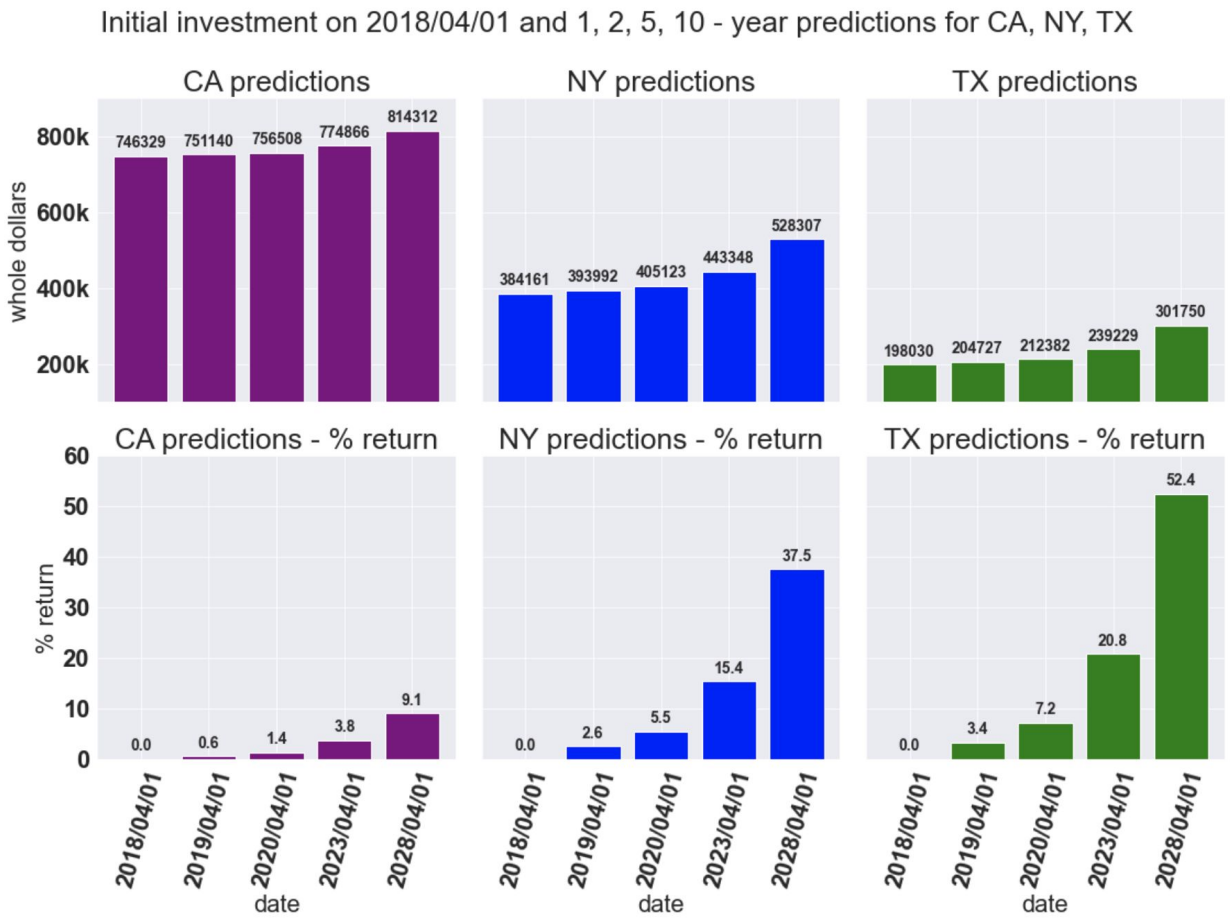


5-year investment example

CA: with initial investment of $746,329, in 5 years it is predicted to grow up to $774,866 resulting in 3.82% return on investment

NY: with initial investment of $384,161, in 5 years it is predicted to grow up to $443,348 resulting in 15.41% return on investment

TX: with initial investment of $198,030, in 5 years it is predicted to grow up to $239,229 resulting in 20.8% return on investment



Recommendation

Between three states (CA, NY, TX): NY and TX have lower barriers of entry and higher return on investments over time. However, during the train-test split analysys, CA prediction was underestimated by 28.42%. Thus, it is possible for CA homes to have higher than predicted returns.

Overall, I recommend investing in NY and TX homes over CA. Those states have lower home prices and higher expected returns. Although, please keep in mind that these predictions are averages for the whole state and are not expected to accurately predict by individual cities.

Next Steps

- Update the dataset up to the current date
- Shift focus from states to cities or zip codes
- Add more models, such as SARIMA and/or SARIMAX

Questions?

GitHub: https://github.com/darigak/Real_estate_forecast

LinkedIn: https://www.linkedin.com/in/darigakokenova/