Predicting Future United States population trend
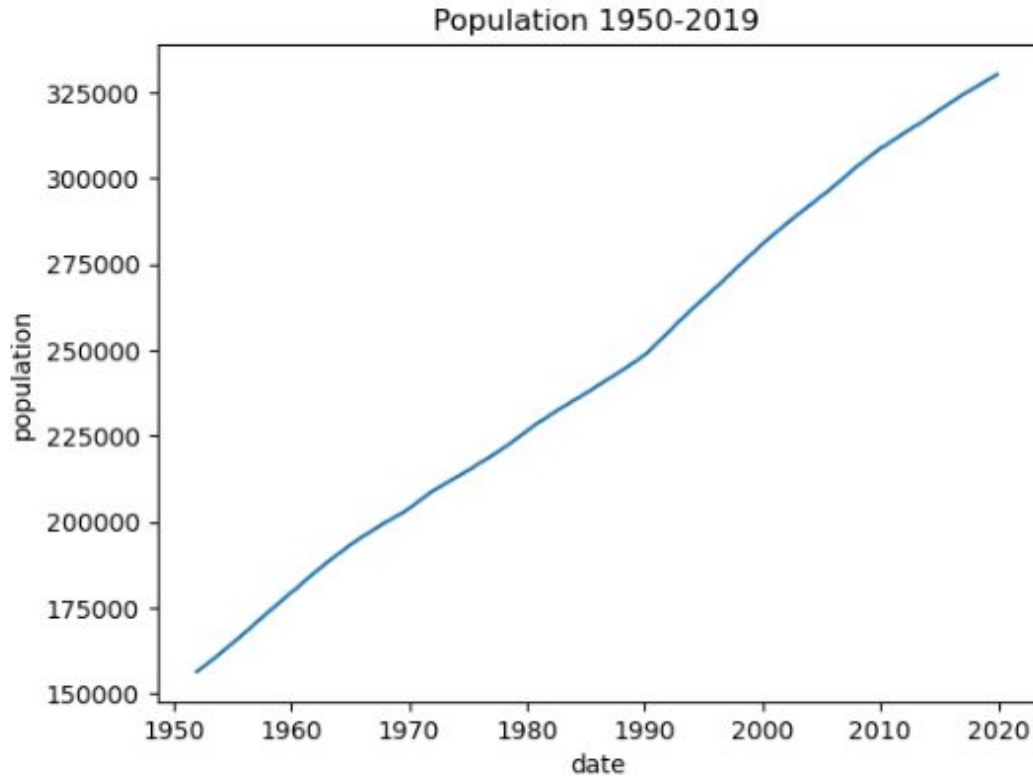
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Objective

Predict the future trend of the United States population.

Question

Is the United States population going to have a decreasing or increasing trend?

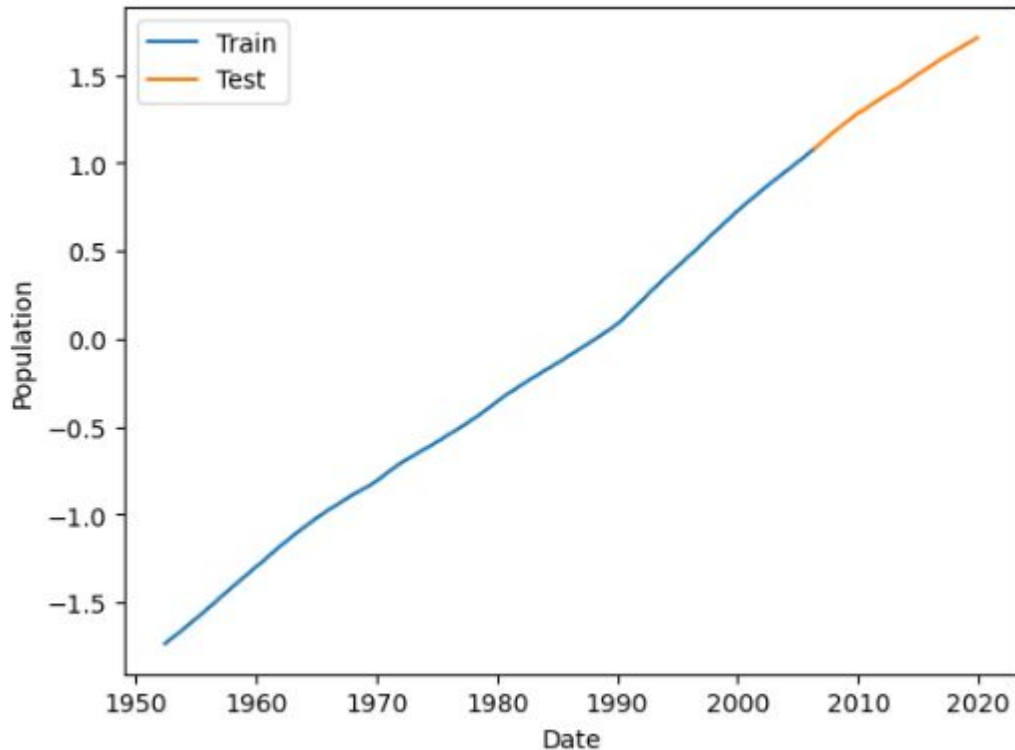Will either trend be at the same rate as it has been?

Current Trend from 1950 to 2019

Population 1950-2019

The current trend over the last 69 years has been at a steady increase.

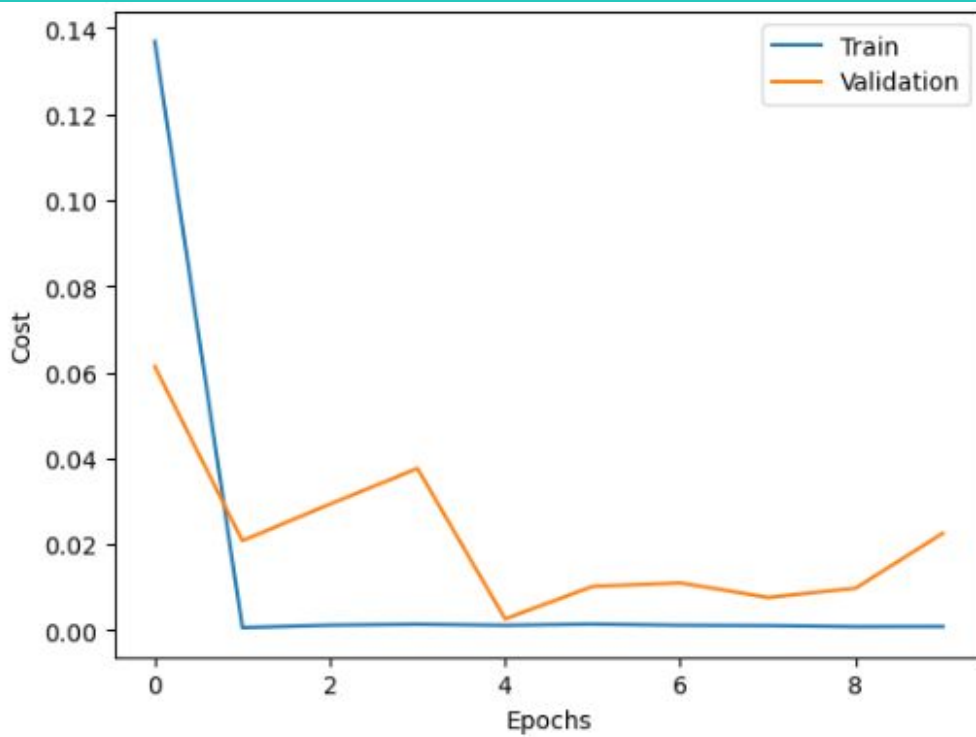However a small taper is slightly visible when approaching 2020.

Scaling the data


One of the first things I did was scale the data.

In this case, I did not use the function train_test_split from sklearn because I needed to maintain the chronological order of the dataset. Therefore I created a function.
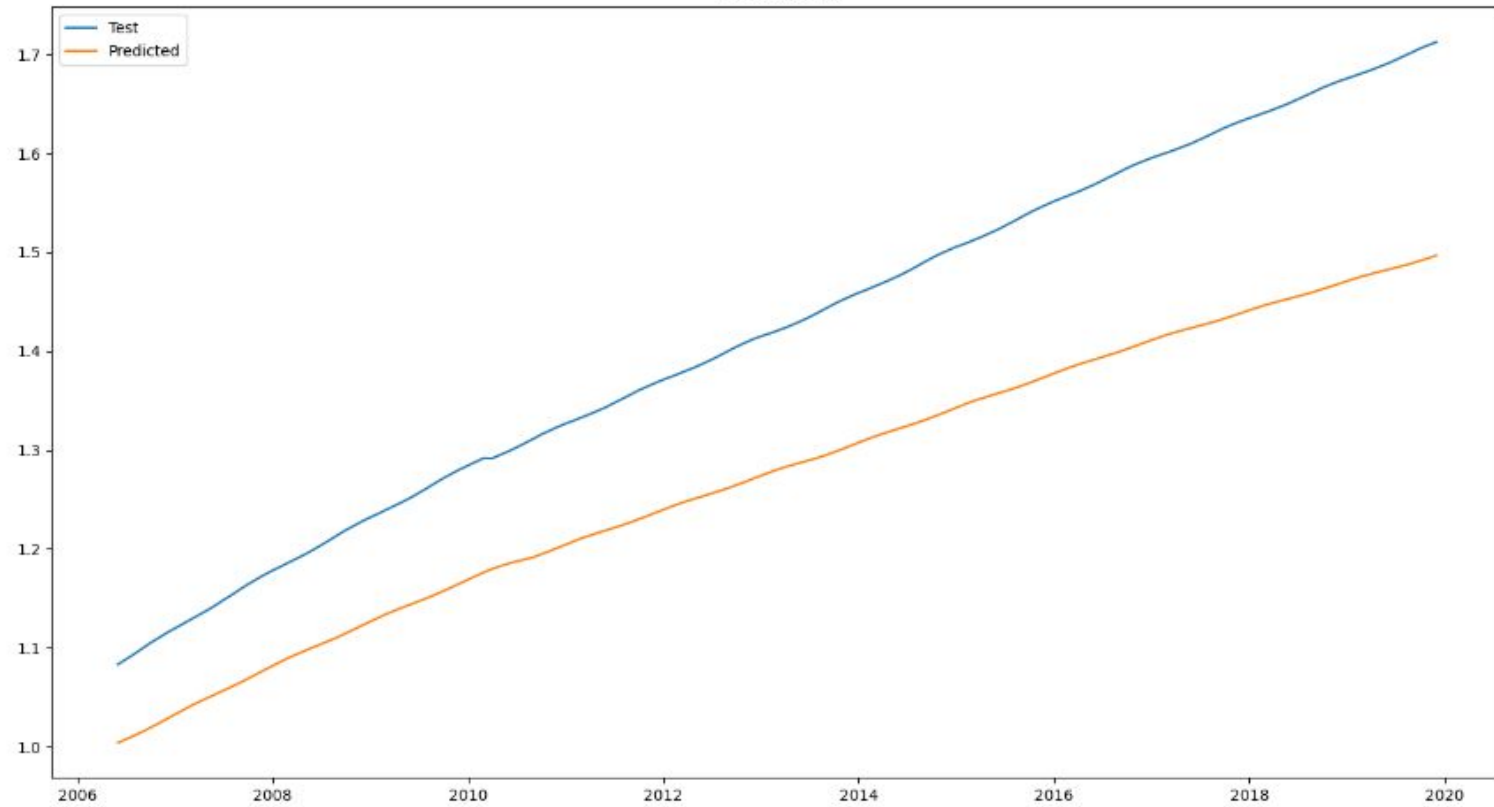
Regression Neural Network LSTM

The chart of validation and training doesn't look as good, but that's because the value is already very low, so there's not a lot of room, that's why I didn't put many epochs for this, so I didn't overfit our model.

Next I created a function to compare the original values with the predicted ones.
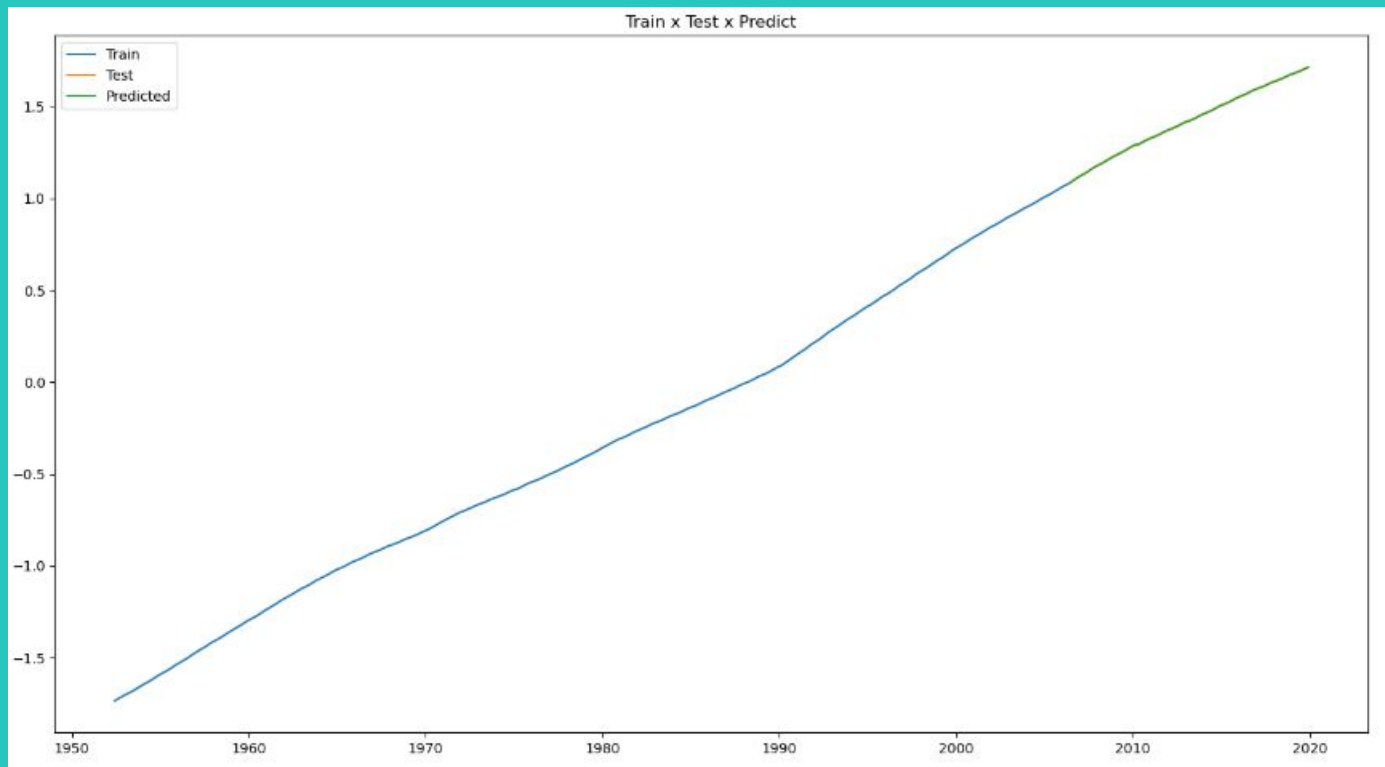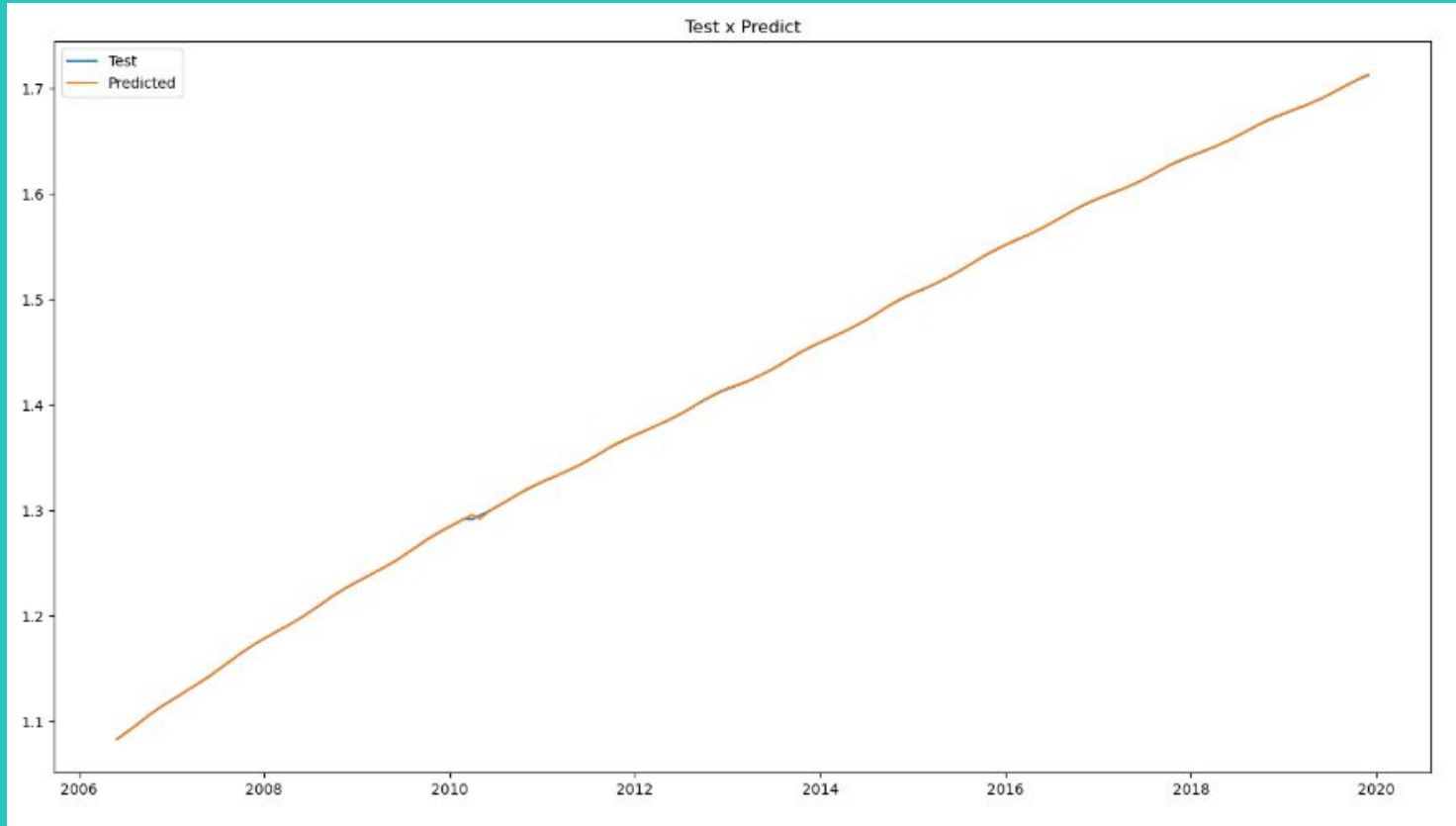

Train x Test x Predict
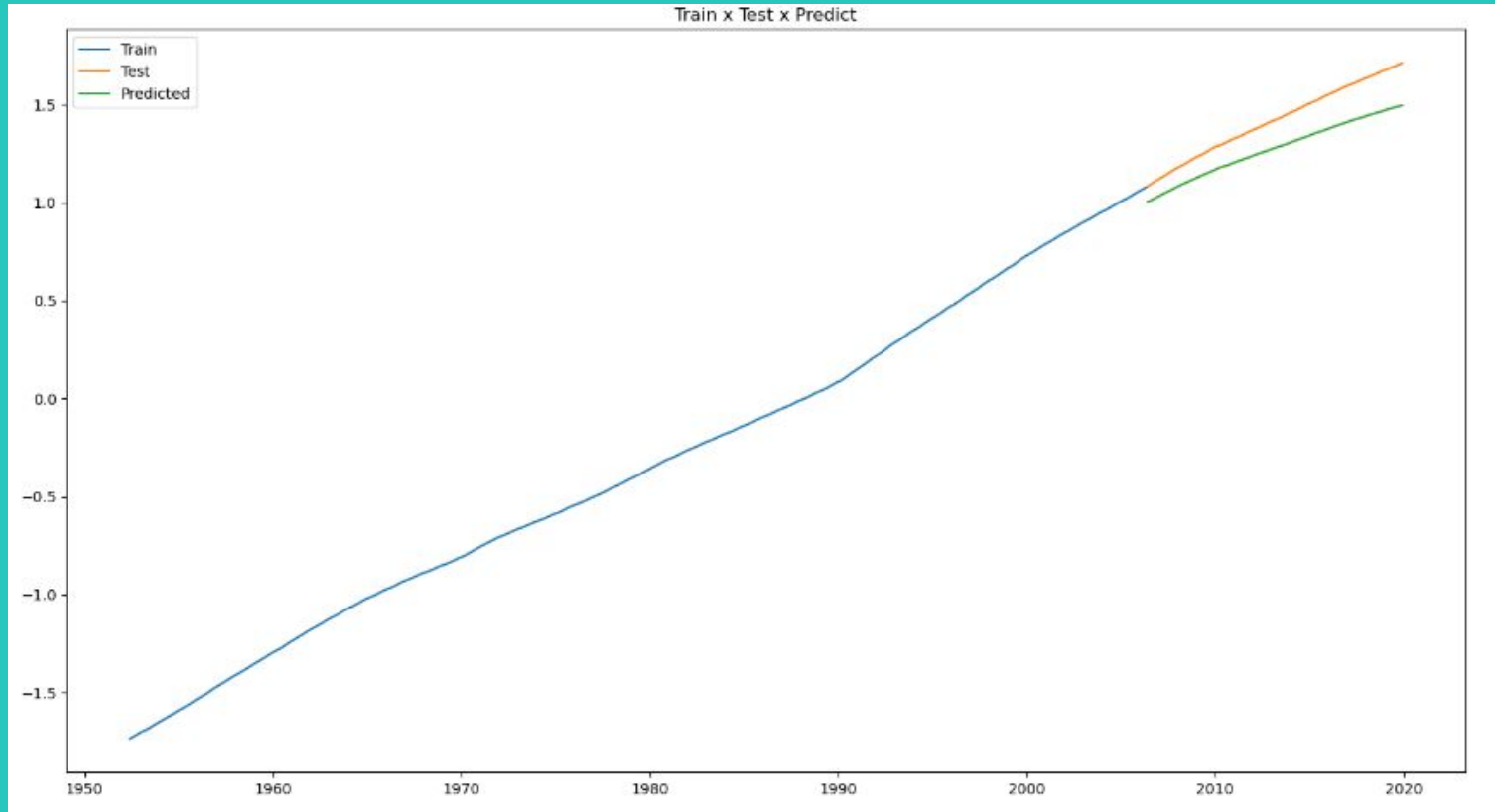
Test x Predict

The previous two graphs were the result of the function comparing the original values with the predicted ones.

The result looks good! Is not perfect, but it's a very good result for a simple neural network without many changes or adjusts.
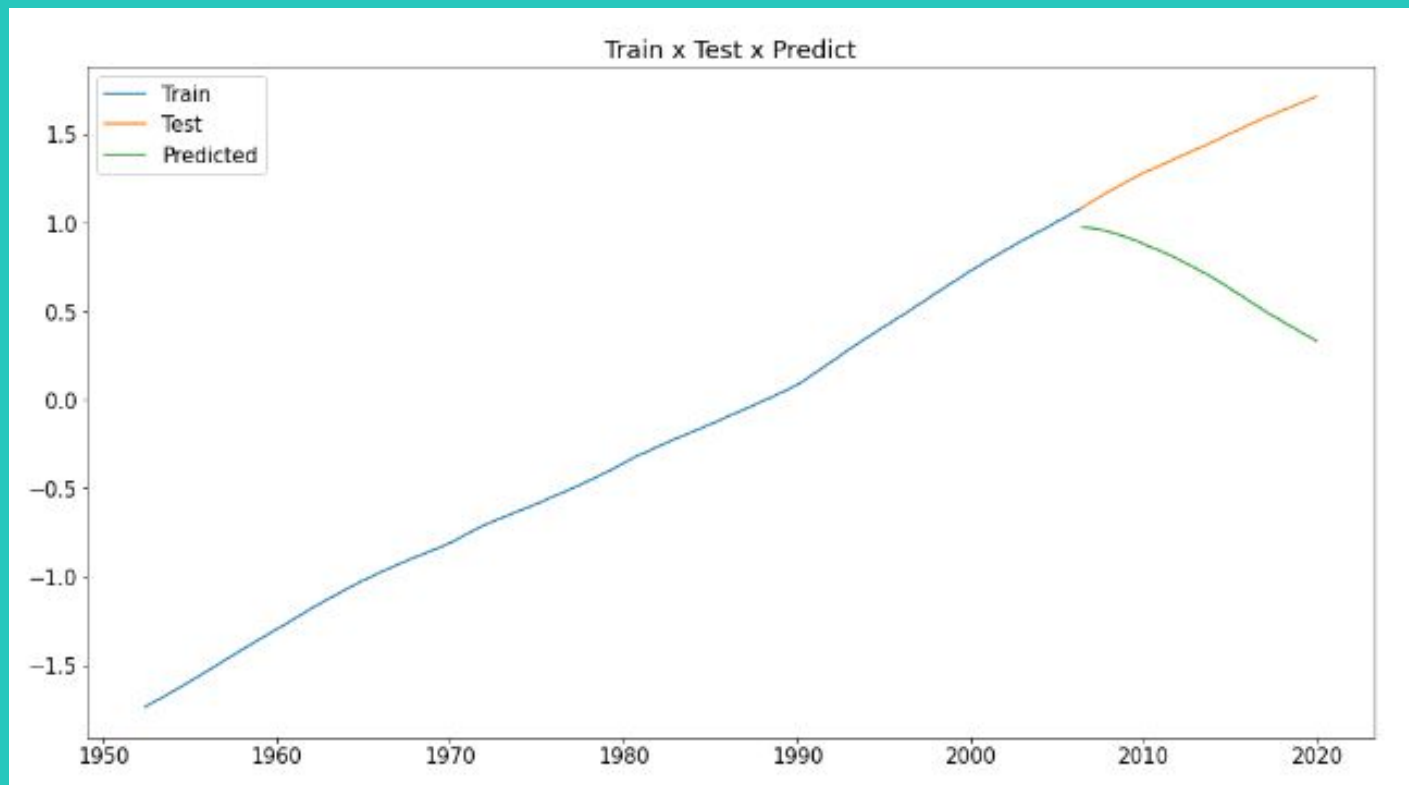
Linear Regression

Train x Test x Predict
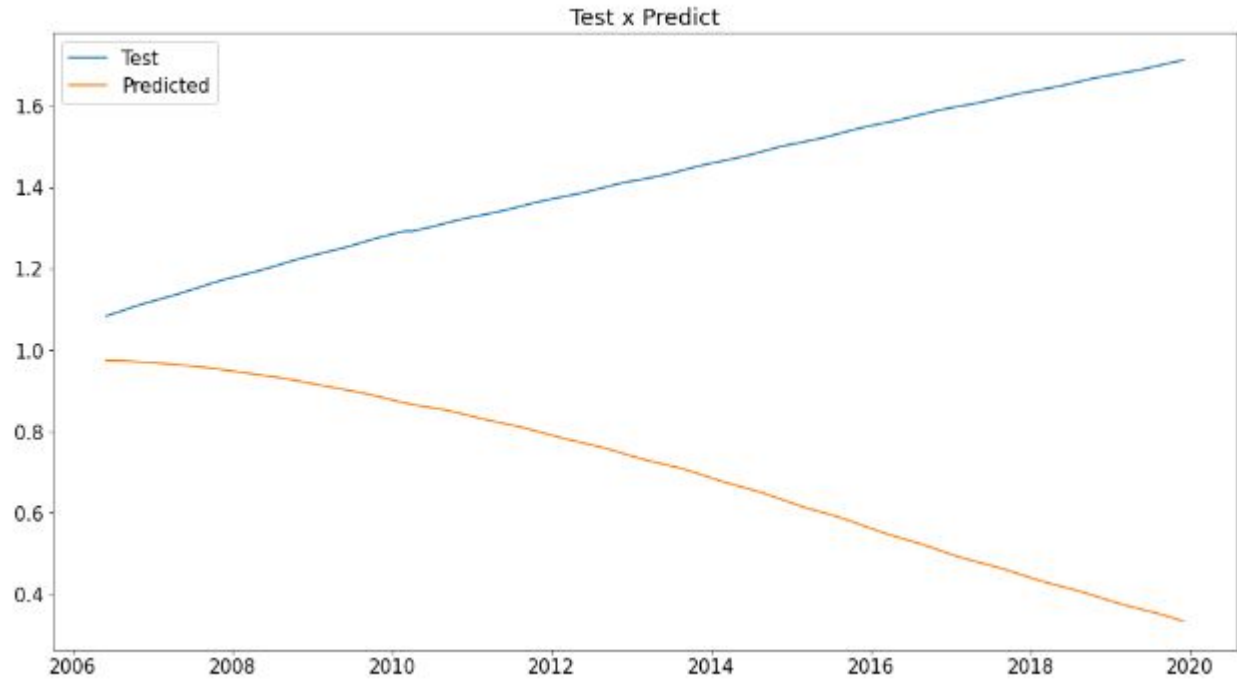
Linear Regression

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The previous two graphs of linear regression look better than neural network, most likely due to the fact that the data set is very simple.
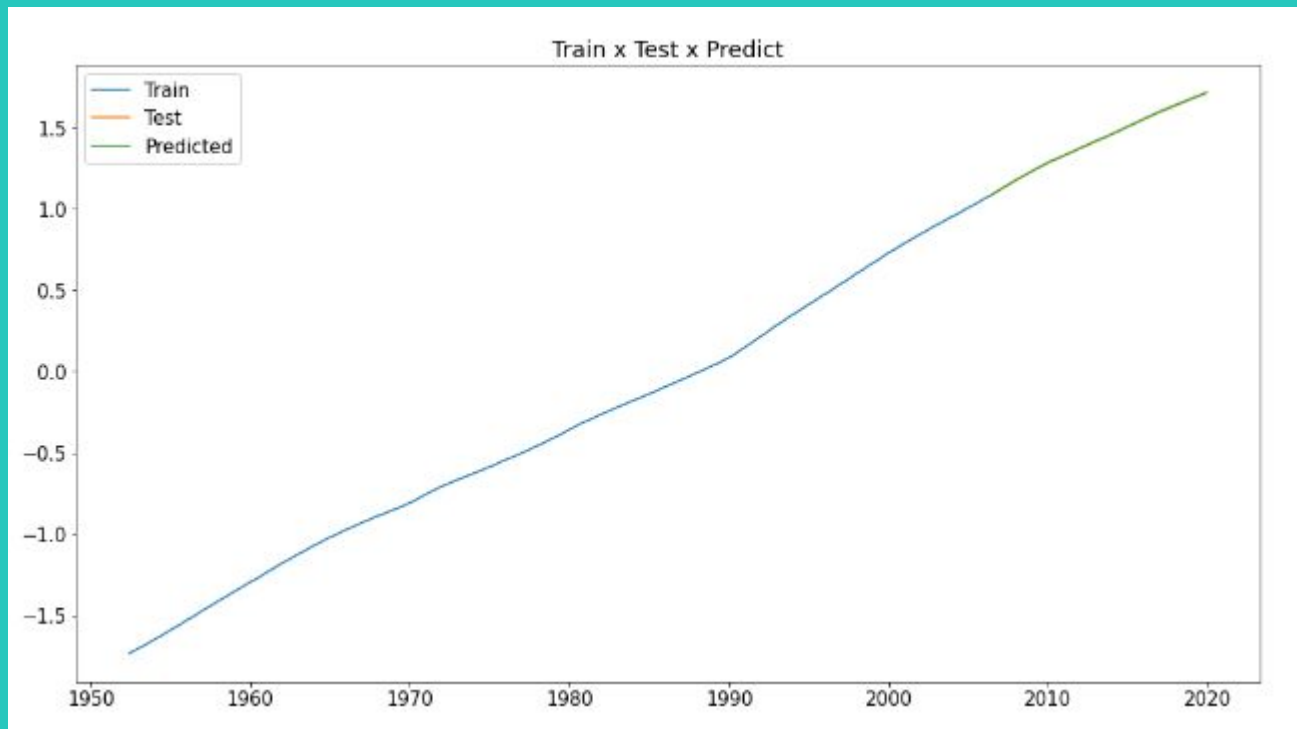
— Support Vector Regression

Train x Test x Predict
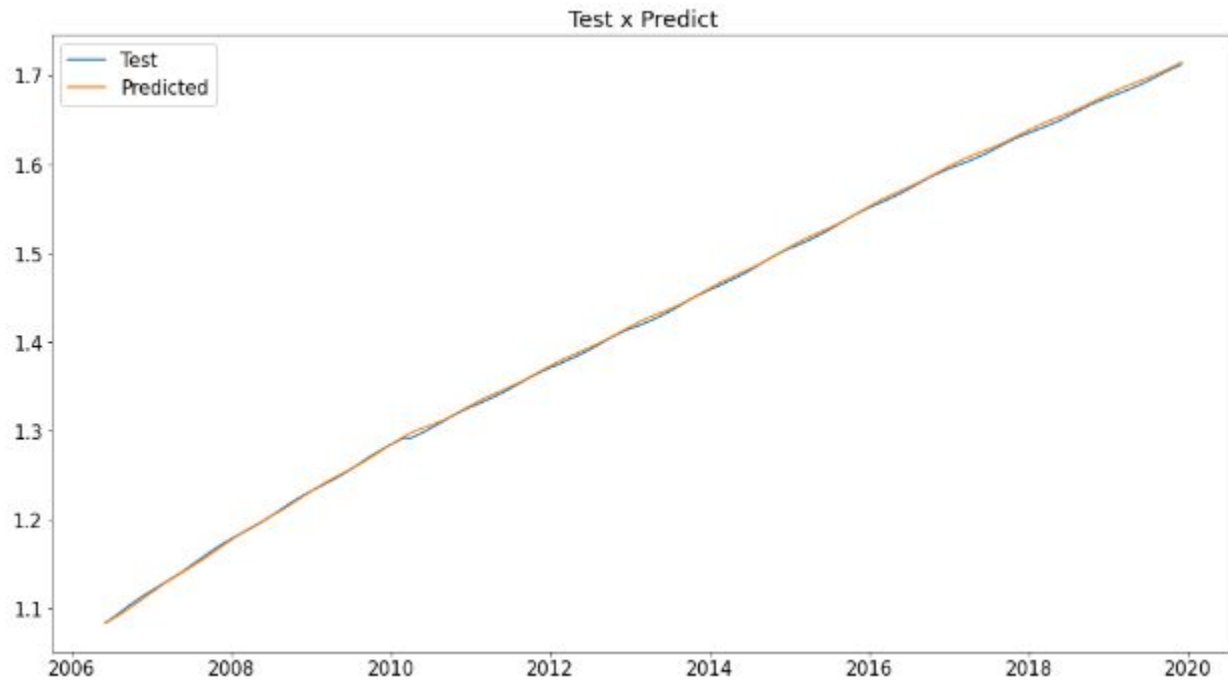
Support Vector Regression

The SVR did not adjust very well to the data.

SGDRegressor

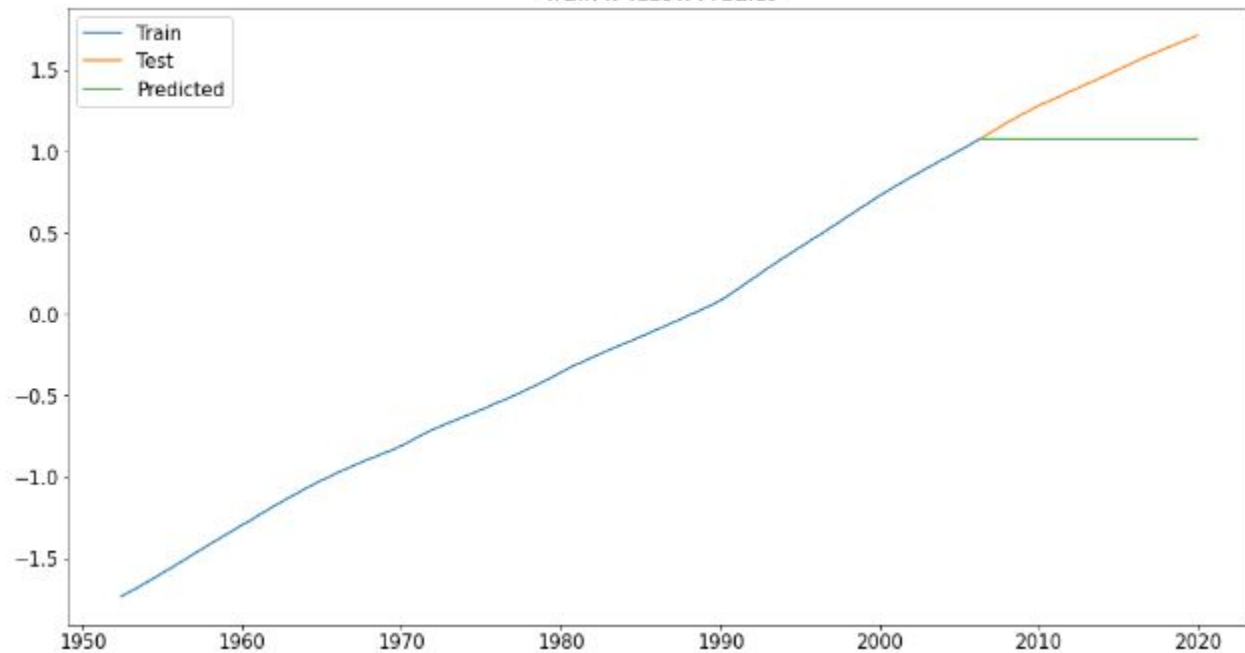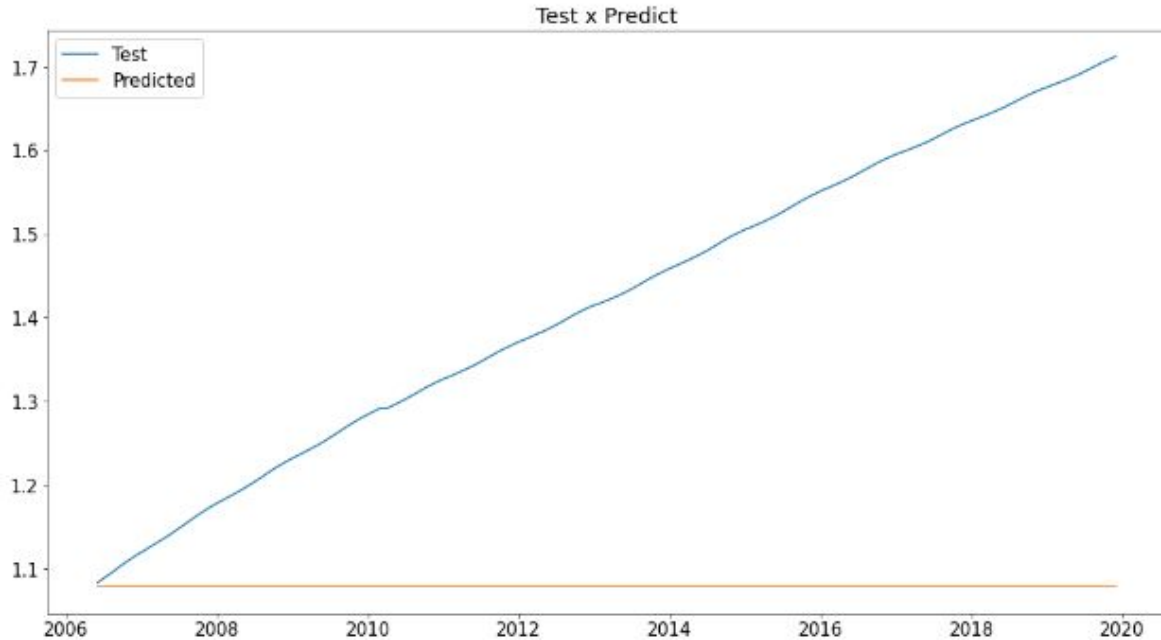Train x Test x Predict

SGDRegressor

Test x Predict

The SGDRegressor had very similar results to the linear regression.

Decision Tree Regressor

Train x Test x Predict
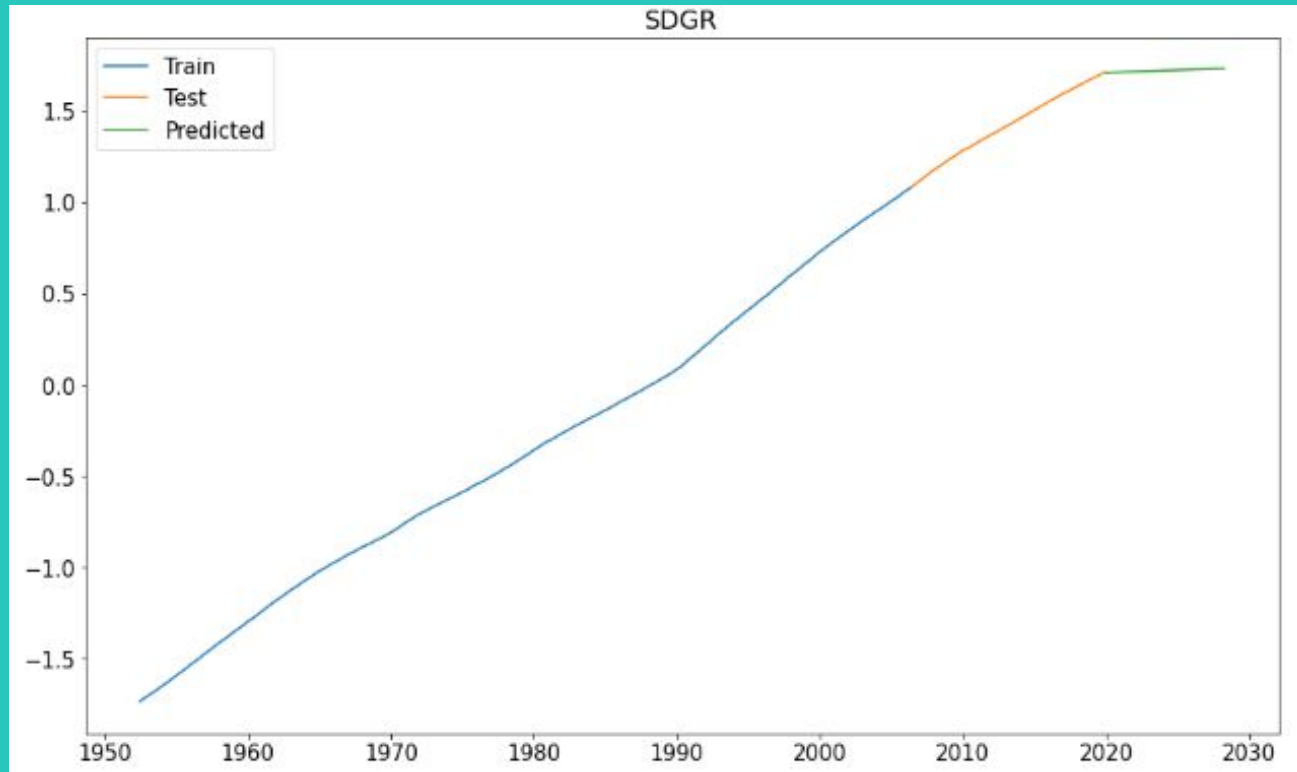
Decision Tree Regressor

Test x Predict

—

Very strange results from the decision tree regressor.

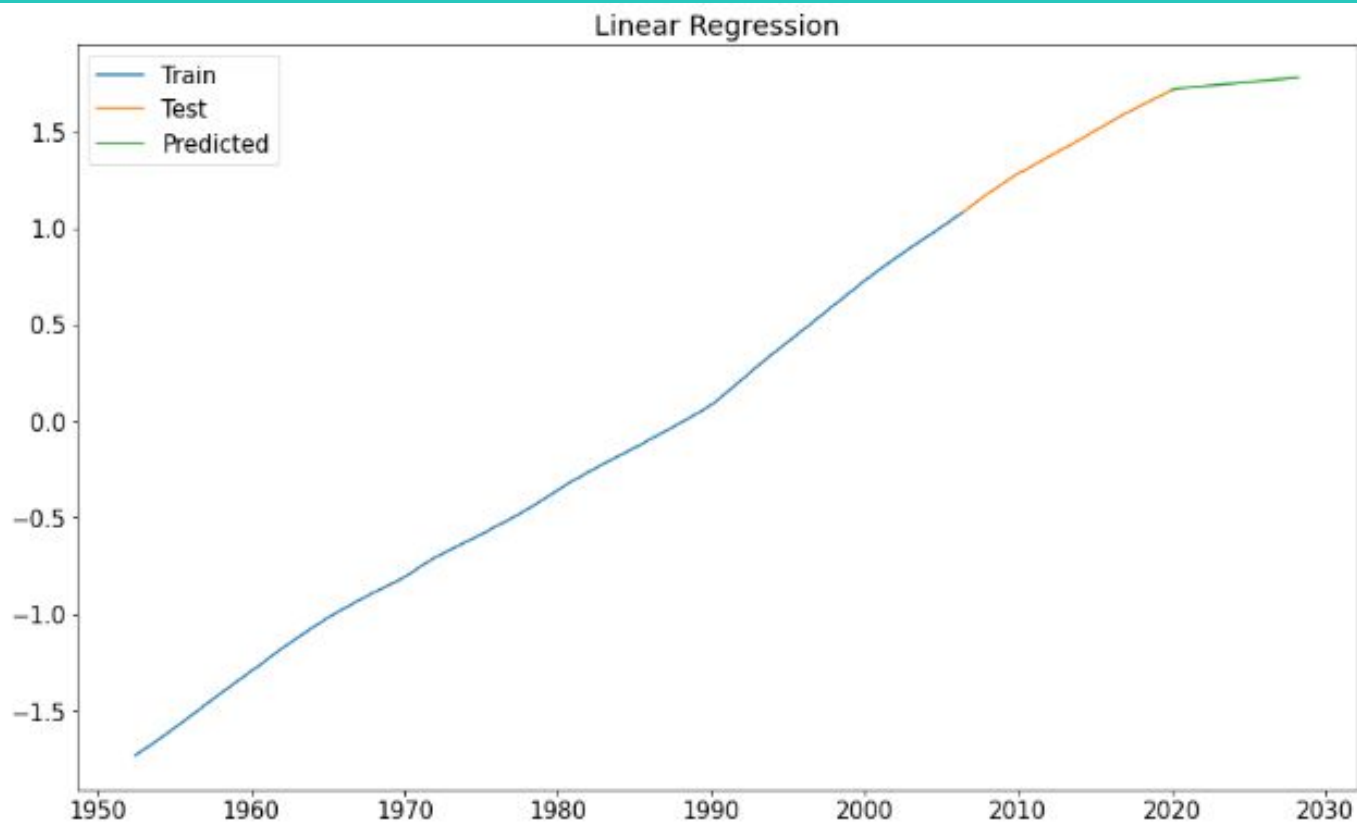I think the parameters would need to be adjusted.

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Predicting the Future

I created a function to use the previous value calculated to use as entry to the next prediction, so we can create a time series with predicted values!

Predicting the Future - SDGR

Linear Regression

Predicting the Future

Linear regression and SDGRegression gave the best results.

It appears that the rate of increase of the population of the United States will decrease.

The population does not look like it will decrease either but rather taper off.