Harvesting Insights: The Economic Impact of Corn and Soybeans on Rural America
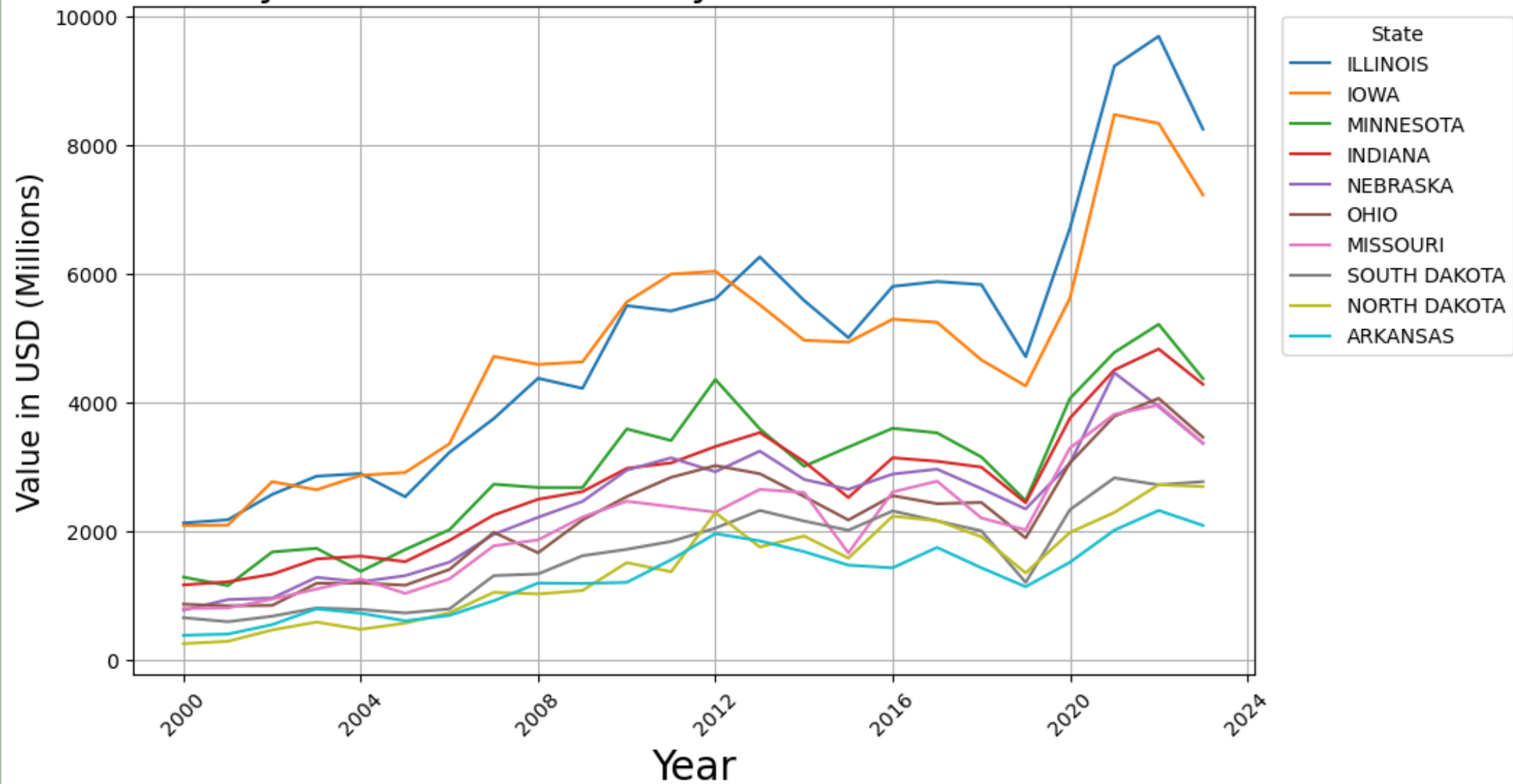
Analyzing 15 Years of Crop Trends to Predict Economic Outcomes from Corn and Soybean Production

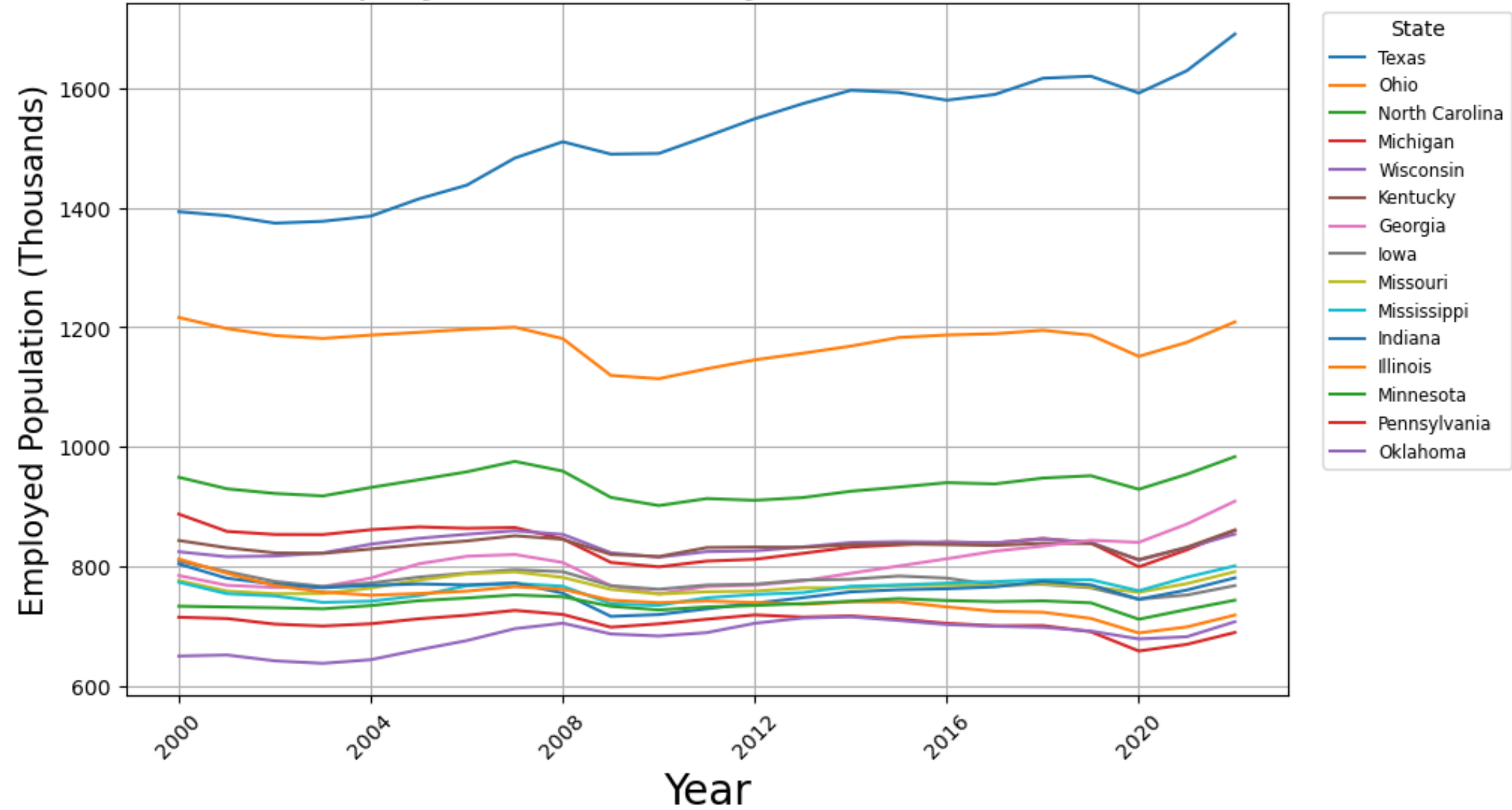# Exploratory Data Analysis

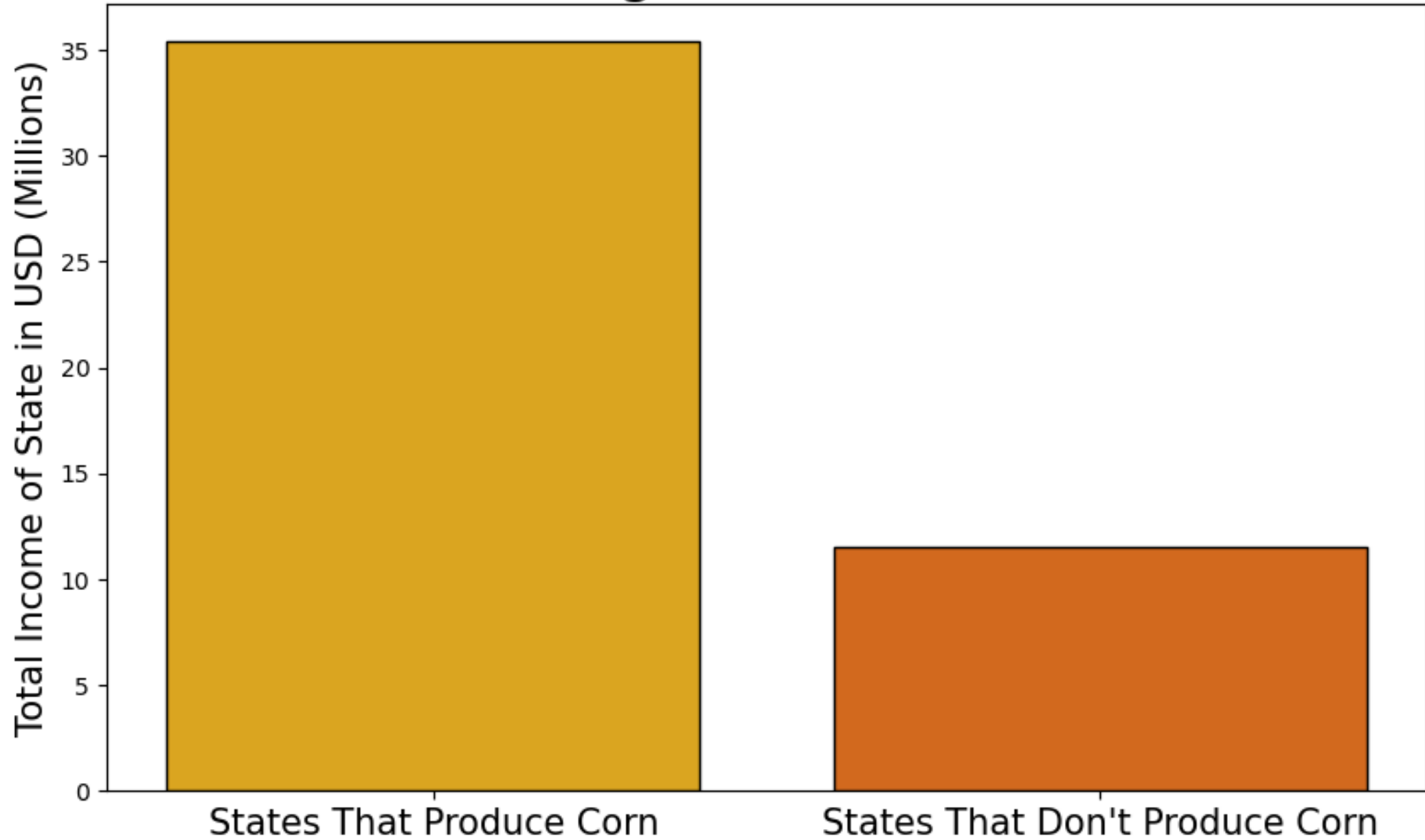Corn Farm Acreage Trends by State From 2000-2023
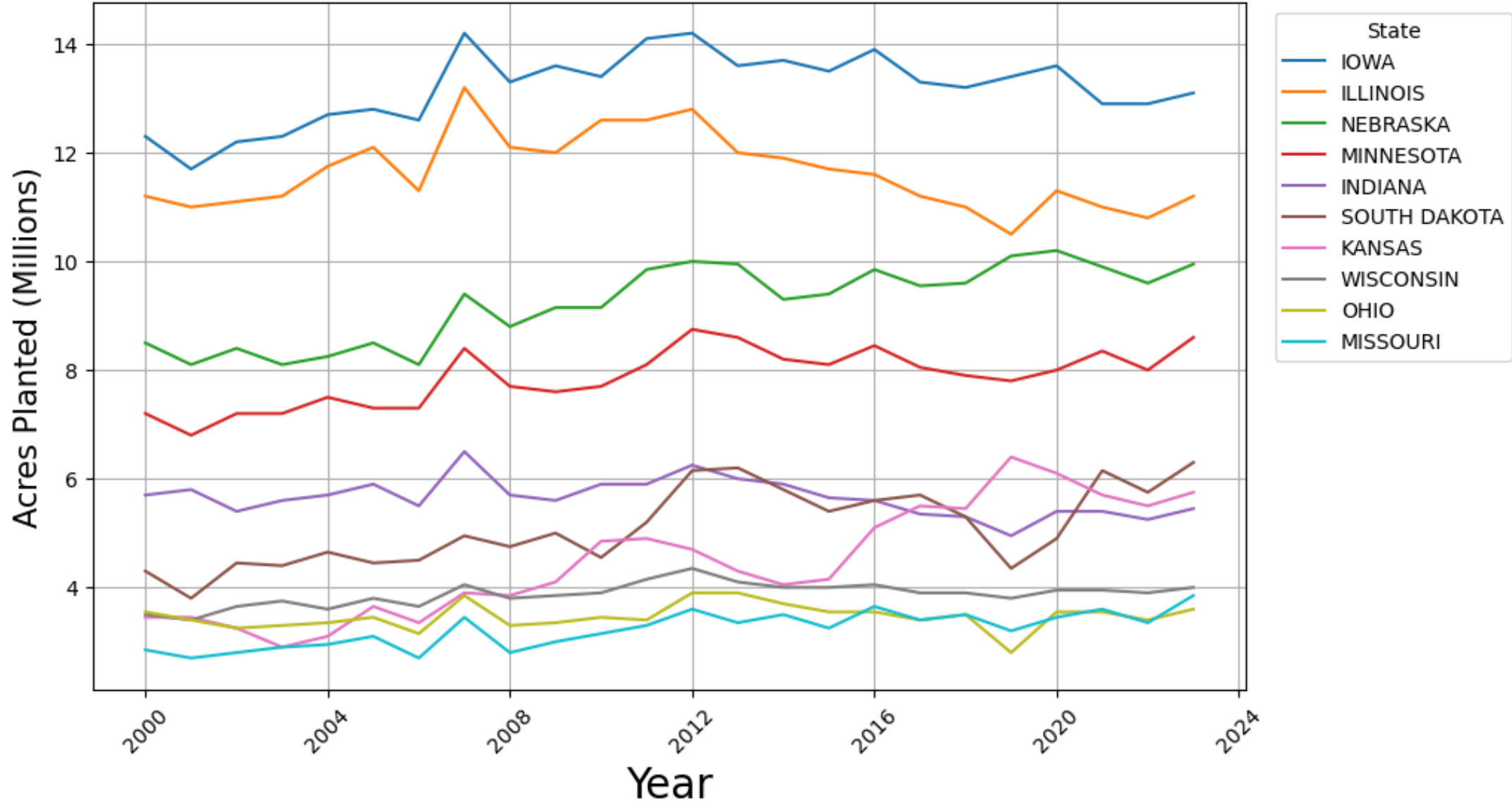
Soy Production Trends by State From 2000-2023

Rural Employment Trends by State From 2000-2023

Average Total Income

Corn Industry in 2023

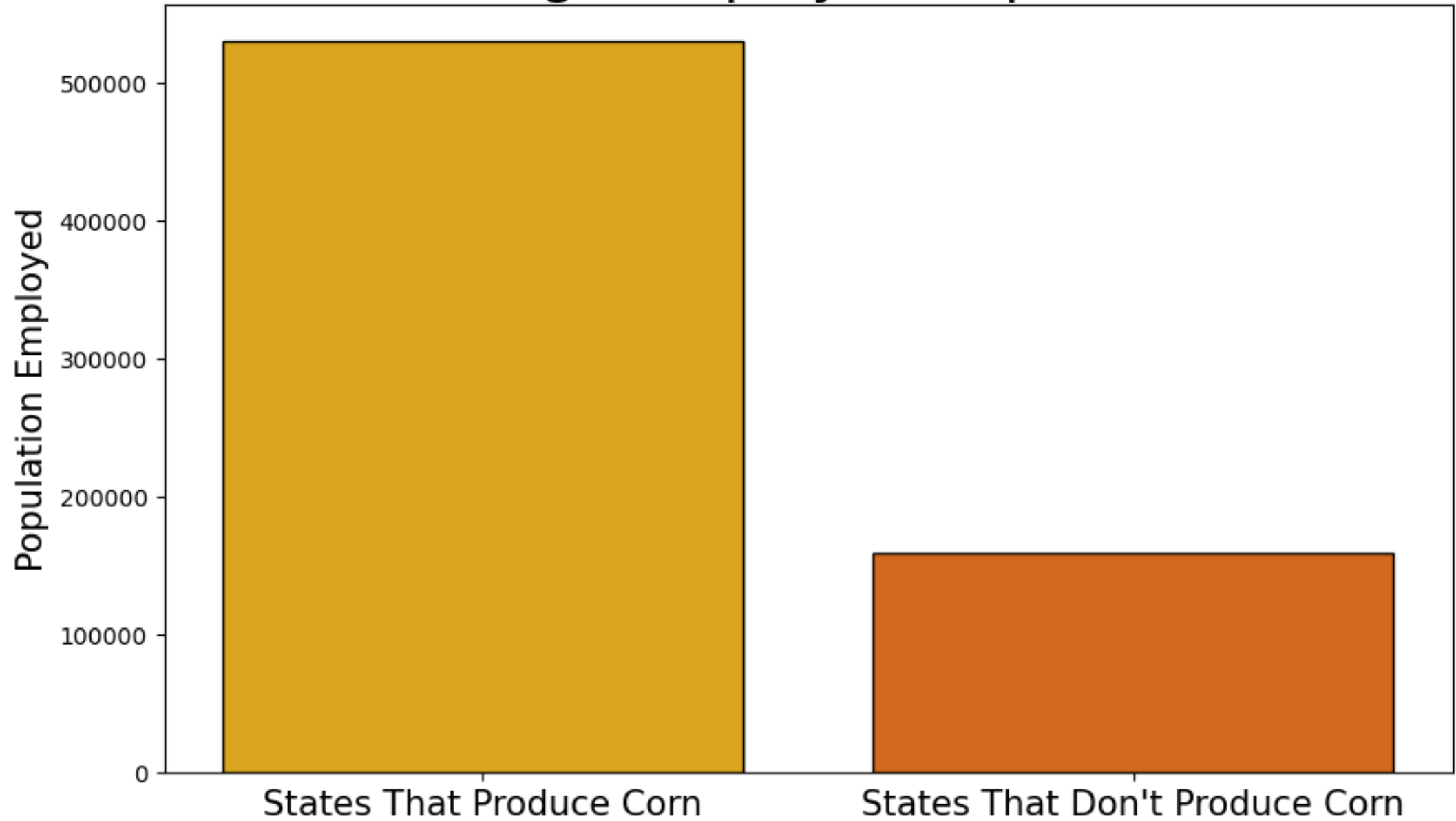## GDP

$62 billion contributed

Jobs

600,000 nationwide

Economic Output

$151 billion

Average Employed Population

Positively Correlated Factors

Corn & Soy Farm Acreage, Production, & Value —— 0.26 —— Personal Rural Income

Corn & Soy Farm Acreage, Production, & Value —— 0.42 —— Rural Employment

EDA Summary

Production:

Corn & soy production is trending upwards.

Employment:

Agriculture jobs are stabler than other industries.

Economic Impacts:

Intertwined nature of agricultural productivity, economic stability, and employment.

Preprocessing Data

Getting Data Ready for Modeling

1. Merging Data

2. Handling Missing Values

3. Removing Duplicates

4. Renaming / Categorizing Columns

5. Scaling & Normalization

6. Feature Selection & Engineering
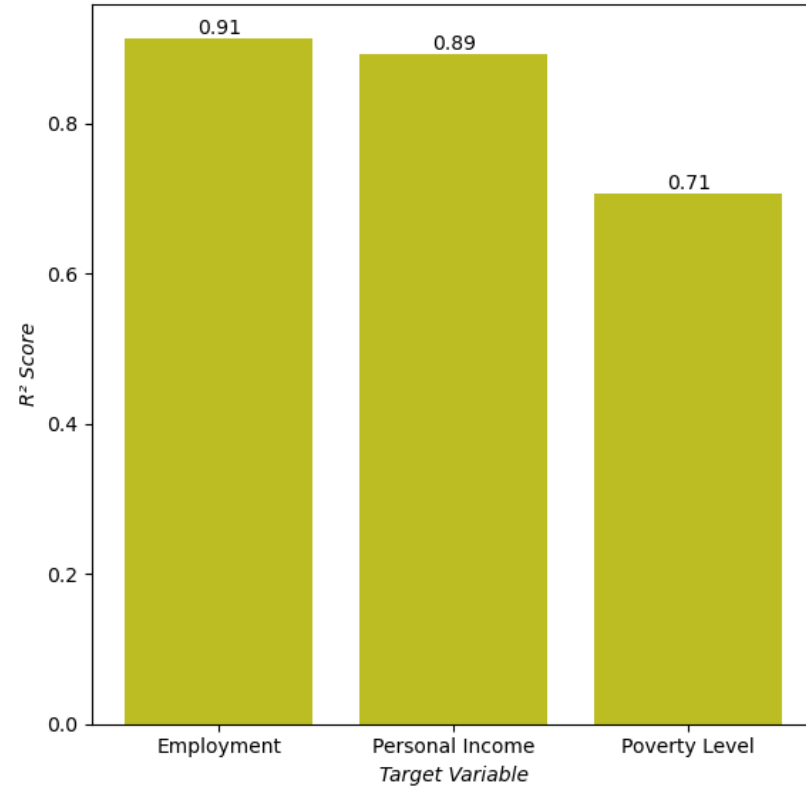
7. Dealing with Collinearity

Predictive Modeling
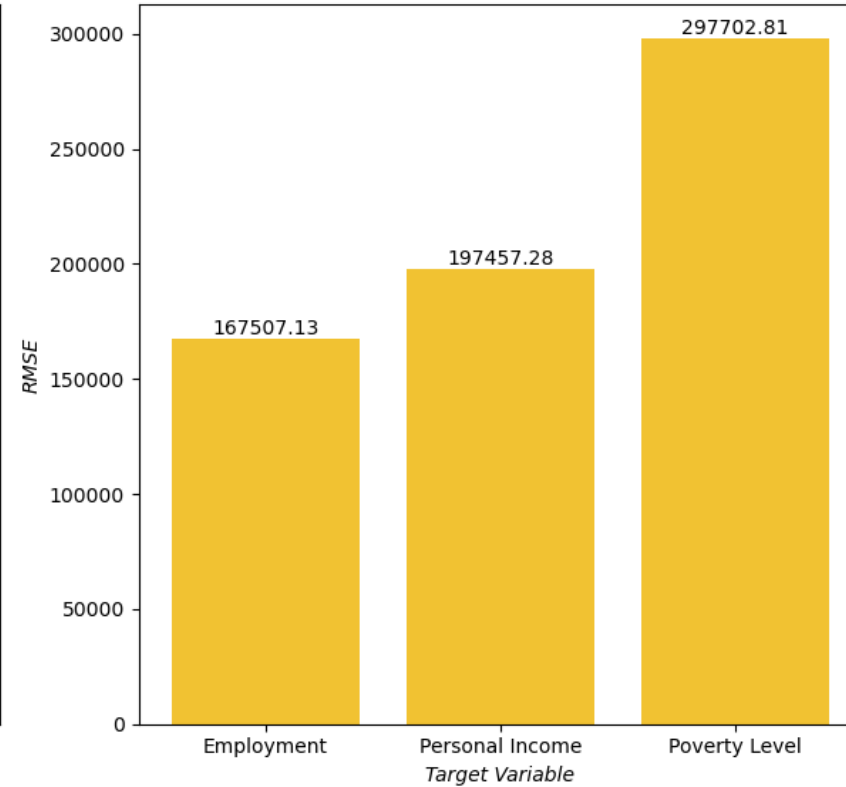
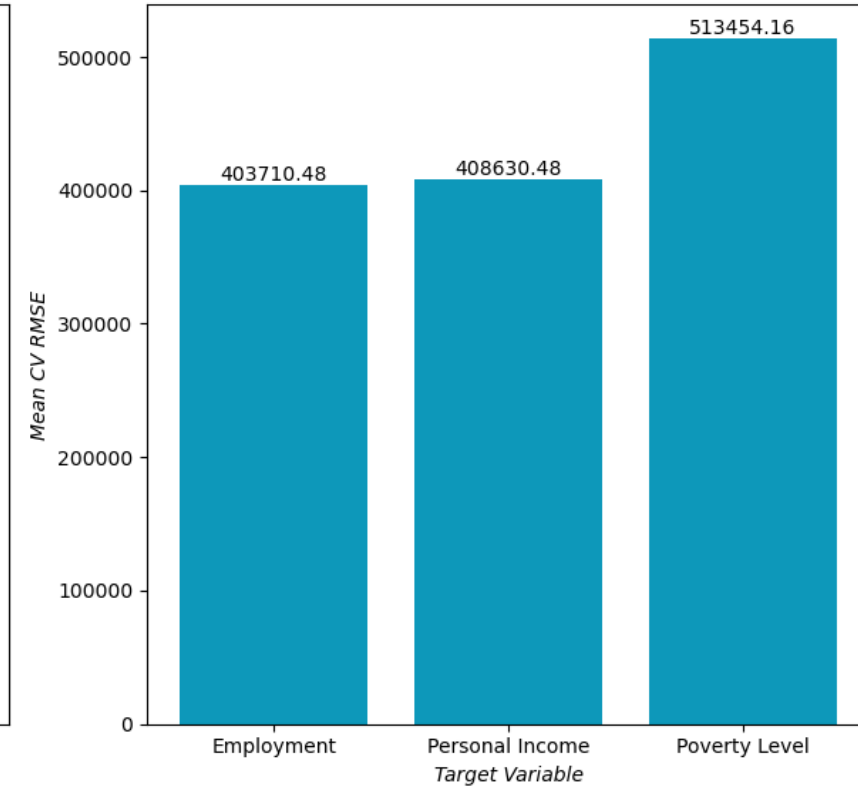# Ridge Regression Model Results
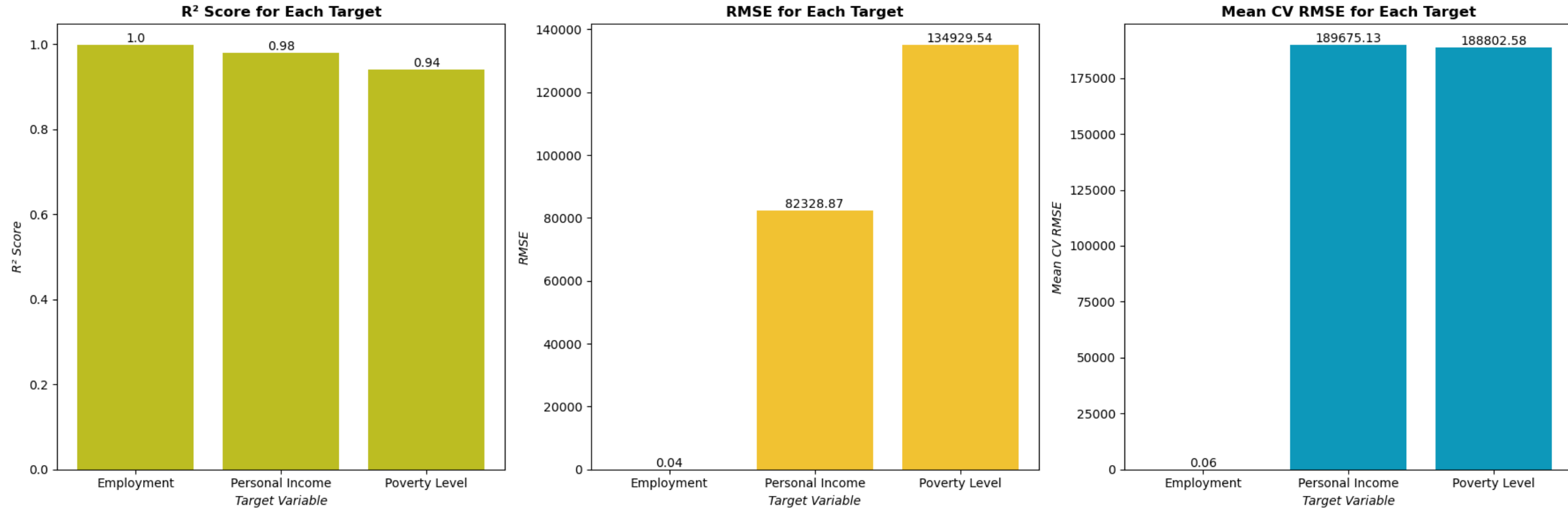
Decision Tree Model Results

Random Forest Model Results
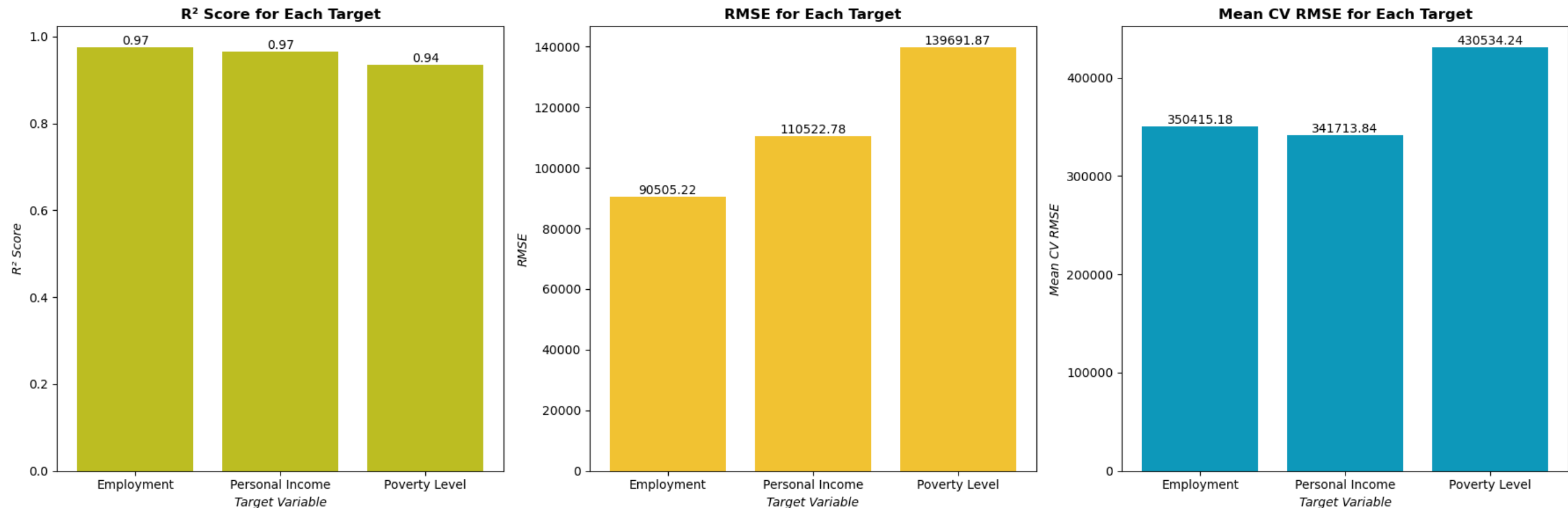
Best Model: Random Forest

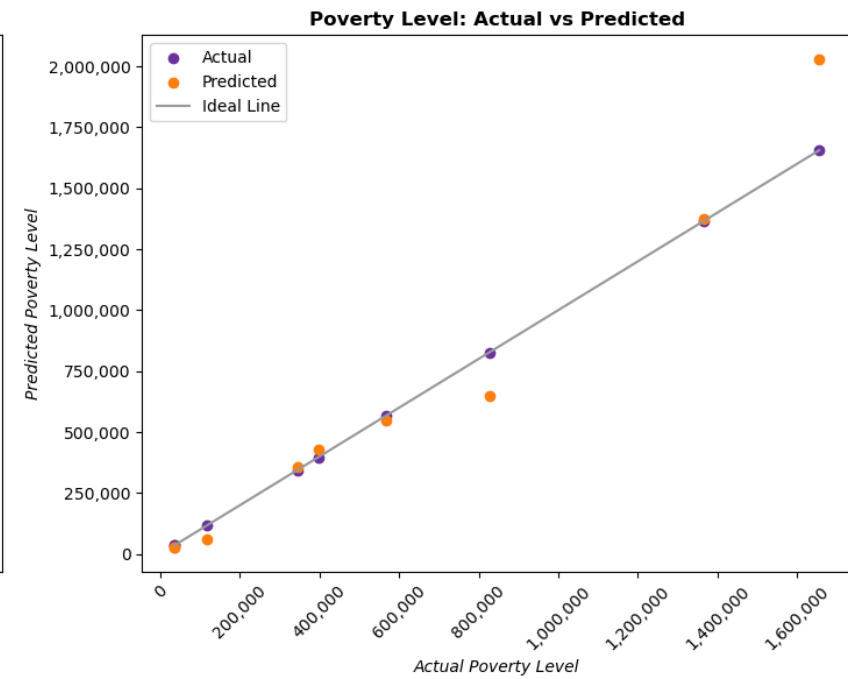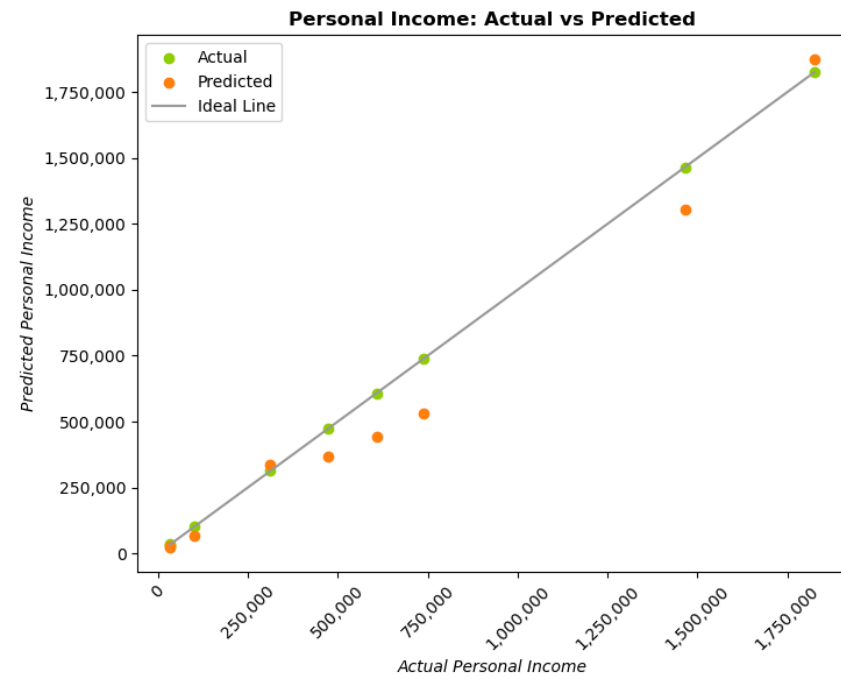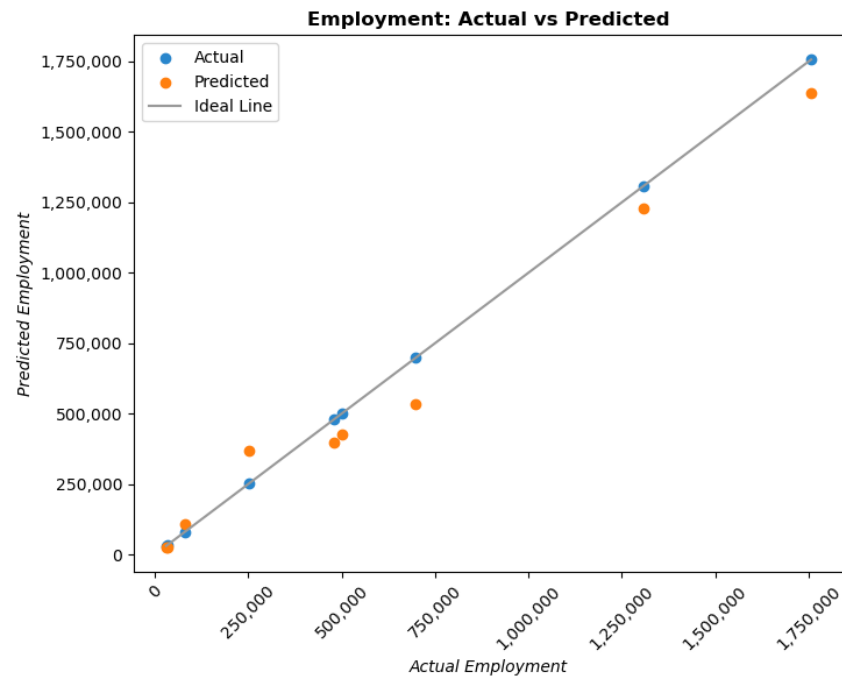# Conclusion

EDA

- Corn and soy farming are significant contributors to the U.S. economy, their economic influence is felt beyond just farming communities, raising incomes in corn-producing regions.

- Following a recession, the corn and soy industries are resilient and dependable due to their necessities in maintaining a stable country.

- Income and employment show positive correlations with corn and soybean production metrics.

Modeling

- Corn and soybean production data have strong predictive potential for employment and moderate potential for personal income in rural areas because they are likely closely tied to the agricultural sector, making crop production trends good indicators of rural employment and income.

- Poverty levels, seem to be influenced by more complex factors beyond crop productivity like policy, local economic conditions, and demographic factors.

- Future research could explore integrating other datasets like government assistance programs and local economic policies.