

Implementing Machine Learning for IV Analysis

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April 29, 2024

Abstract

- Machine learning and IV analysis used to study economic impacts of Africa’s slave trades.
- Regions heavily involved in slave trade exhibit poorer economic performance today, as revealed by Double Lasso Regression.
- Research demonstrates advanced analytics’ effectiveness in uncovering persistent economic disadvantages from African slave trades.

Methodology

Replicating Original Study:

- Estimate number of slaves exported using shipping records.
- Examine relationship between slave exports and current economic performance of African countries.
- Use the distance from trade routes as an instrumental variable and performed Two-Stage Least Squares.

Enhancing with Machine Learning:

- Use the Lasso selection method to determine the most relevant variables for the regression.
- Regress the instrumental variable with the features selected using lasso.
- Regress GDP on the predicted values, including the features selected using lasso in the model.

Results Comparison

- The year 2000 used in the original study was the least significant year
- The negative correlation between export area of slaves and economic outcomes was more significant in the expanded replication
- The double lasso regressions found a stronger correlation than both the original study and the expansion of the original.

Table: Regression Results Summary

Independent Variable	Coefficient
Original correlation(2000)	-.286
Double Lasso correlation (2000)	-.556
Expanded Correlation Avg (01 - 22)	-.365

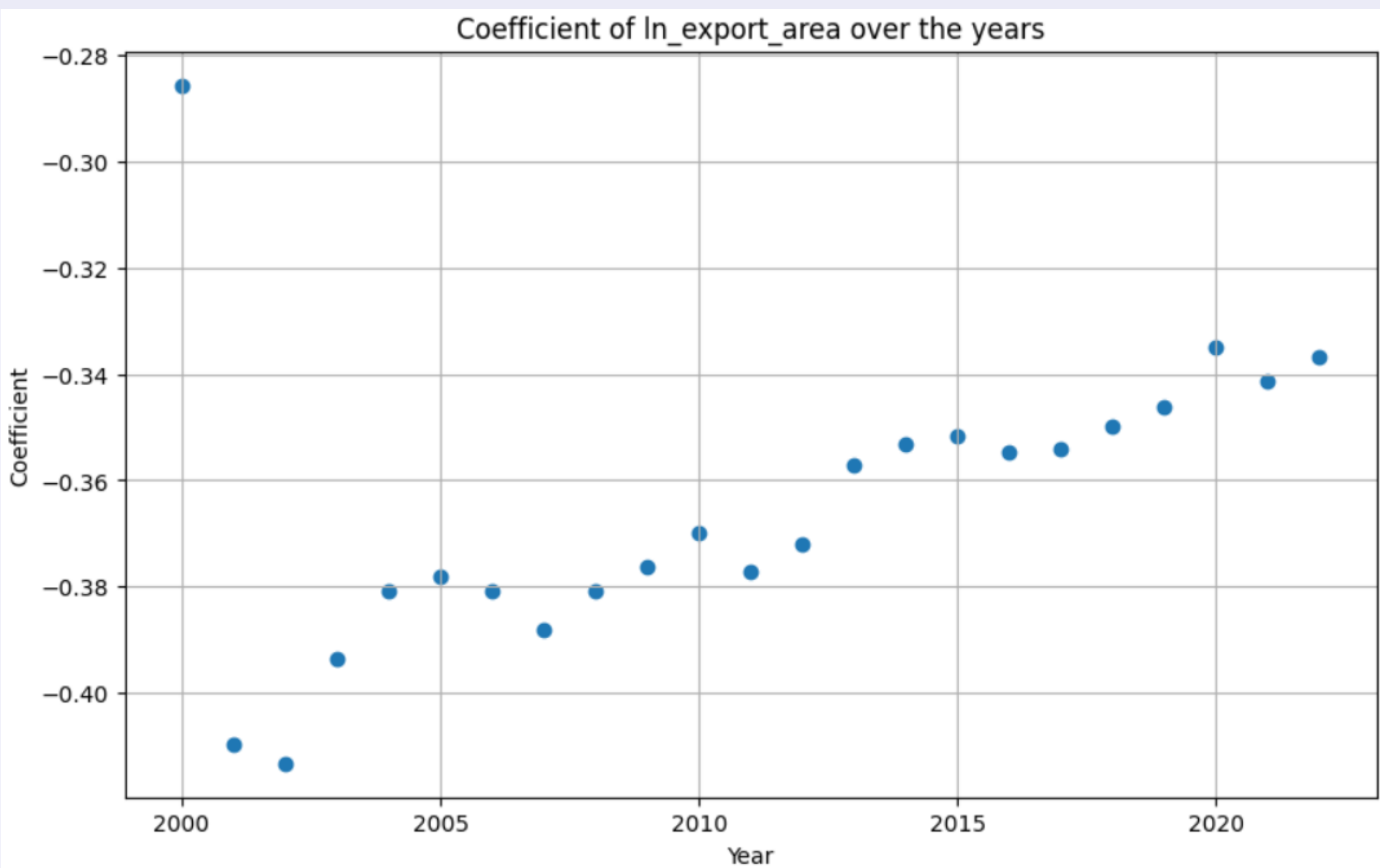


Figure: Average Correlations between Export Volume and Economic Outcomes

Discussion

- Specifying more relevant variables in the double lasso regression led to a stronger correlation being found than in the original paper
- Expanding the years studied of the original replication also produced more statistically significant correlations than the original

Conclusions

- Double Lasso confirms strong link between past slave trade and present economic conditions.
- Highlights importance of acknowledging historical injustices like slave trades in understanding current economic disparities in Africa.
- Demonstrates the value of advanced statistical methods in historical economic analysis.

Supplemental Content

