

# Africa's Slave Trades: Implementing Machine Learning for IV Analysis

Christopher Colon, Anel Rodriguez, Madison Stevens, Charlie Stutts, and Davis Xu  
ECMT 680: Financial Econometrics  
Dr. M. Jahangir Alam  
Texas A&M University  
Spring 2024

## Abstract

This study utilizes machine learning and IV analysis to examine economic impacts of Africa's slave trades. The results show worse economic performance in regions deeply linked to the slave trade.

## Introduction

- Focuses on the economic impacts of Africa's slave trades using Double Lasso and IV analysis.
- Aims to uncover persistent disparities resulting from historical injustices.

## Literature Review

- Introduction of lasso by Robert Tibshiran.
- Enhance lasso: Zou's adaptive lasso.
- Not effective for all economics research.

## Methodology

### Replicating Original Study:

- Estimate slave exports using shipping records.
- Examine relationship between slave exports and current economic performance of African countries.
- Use distance from trade routes as an IV in a 2SLS.

### Enhancing with Machine Learning:

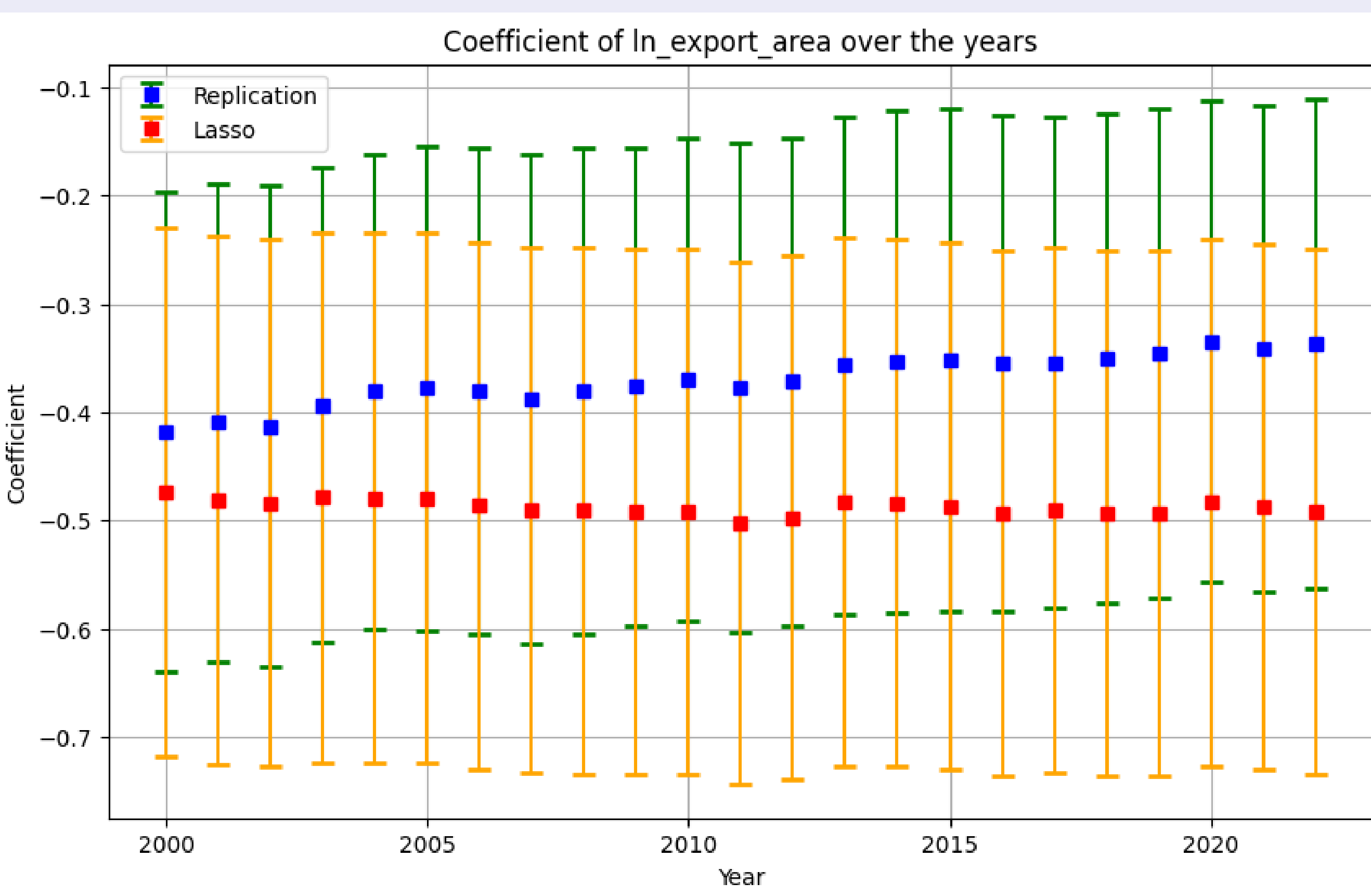
- Select relevant variables using Lasso method.
- Regress IV with features selected using Lasso.
- Regress GDP on predicted values.

## Results Comparison

- The year 2000 used in the original study was the most significant year by a narrow margin
- The negative coefficient between export area of slaves and economic outcomes was still significant in the expanded replication.
- The double lasso regressions found a stronger coefficient than both the original study and the expansion of the original.

Table: Regression Results Summary (using GDP with Base Year of 2010)

Independent Variable	Coefficient
Slave Exp.(Replication; 2000)	-.418
Slave Exp.(Replication; Avg 01 - 22)	-.365
Slave Exp.(Double Lasso; 2000)	-.474
Slave Exp.(Double Lasso; Avg 01 - 22)	-.488



## Discussion

- Expanding years studied in the original replication produces more robust and dependable coefficients.
- Specifying more relevant variables in Double Lasso strengthens correlation findings.

## Contributions

- Integrates machine learning with econometric methods for methodological innovation.
- Demonstrates importance of the context of the study and the complexity of the traditional model.

## Conclusions

- Provides insights into the lasting economic legacies of Africa's slave trades.
- Demonstrates the potential value of advanced statistical methods in historical economic analysis.

## References

Nunn, N. (2008). The Long-Term Effects of Africa's Slave Trades. The Quarterly Journal of Economics Vol. 123, No. 1 (Feb. 2008), 139-176.  
Tibshirani, R. (1996). Regression Shrinkage and Selection via the Lasso. Journal of the Royal Statistical Society. Series B (Methodological), 58(1), 267-288.

## Supplemental Content



Figure: Supplemental Content and Github Link