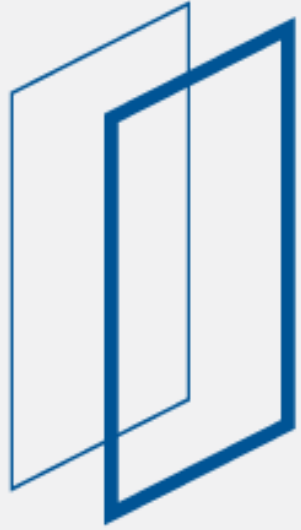# Iustitia's Oracle

Forecasting Political Regime Types by Measuring Judicial Independence

Final Project by Friederike Augustin
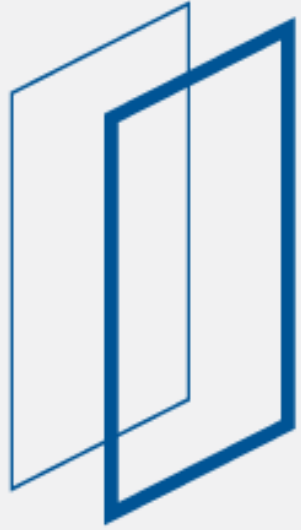
Global Decline in Democracy

Emerging threat:

Political interference in the judiciary undermines the critical role of courts and judges in preserving democracy and upholding its core values.

Independence lies in the details:

- Who selects and appoints judges?
- How long do judges remain in office?
- Who decides on disciplinary matters?
- Who controls the budget of courts?
- etc. etc.

Project Overview

Key Question:

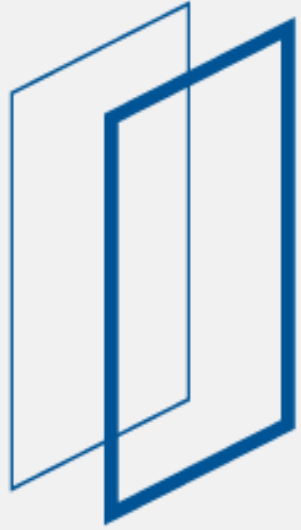Can written law predict the quality of democracy?

Goal:

To predict future political regime types and levels of democracy based on measures of judicial independence.

Data:

1. Dataset on political regime characteristics
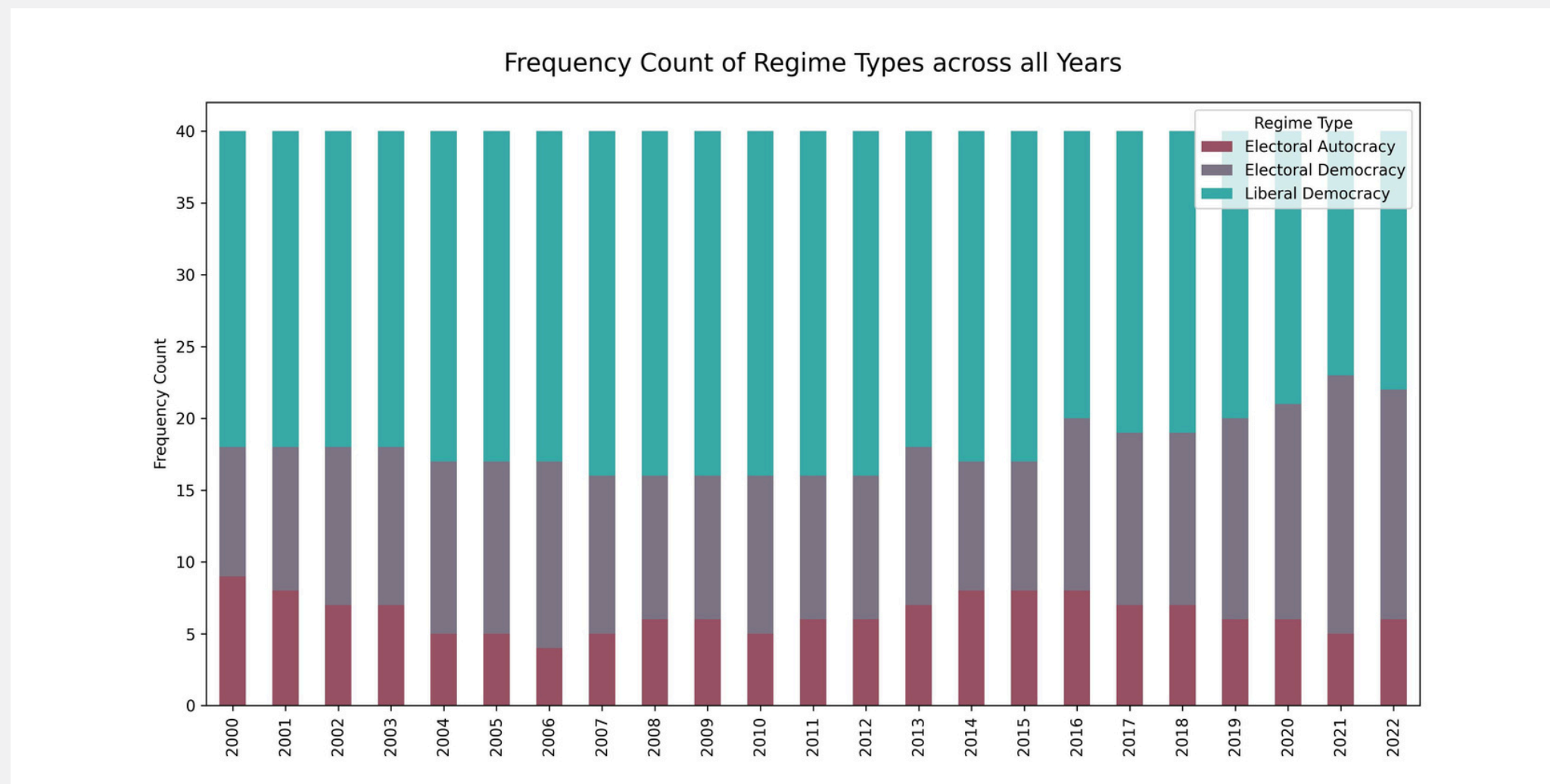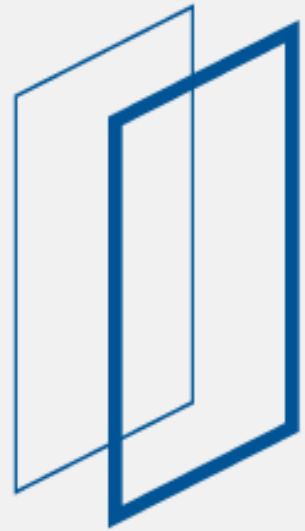2. Dataset on judicial system characteristics and reforms

Data Selection

Varieties of Democracy Dataset (V-Dem)

- Comprehensive and detailed democracy ratings (published anually)
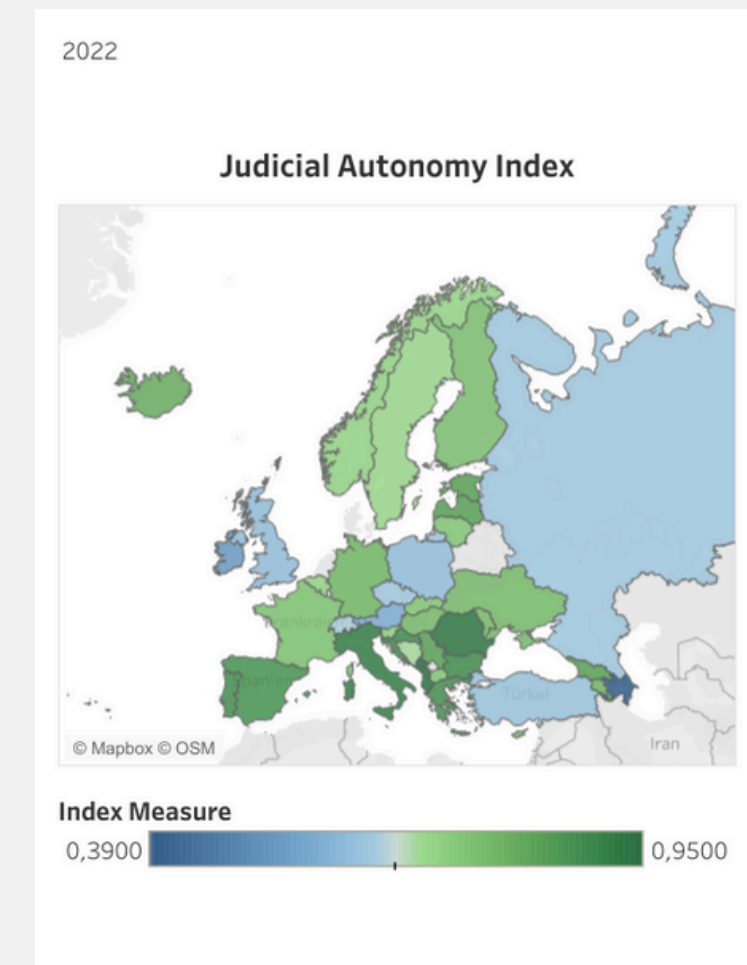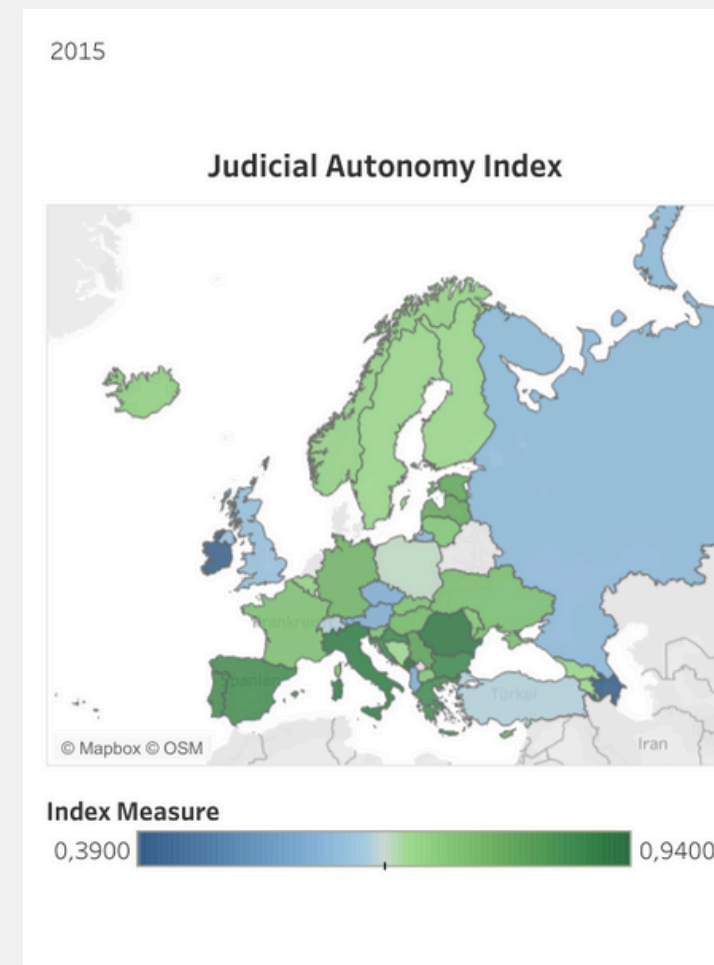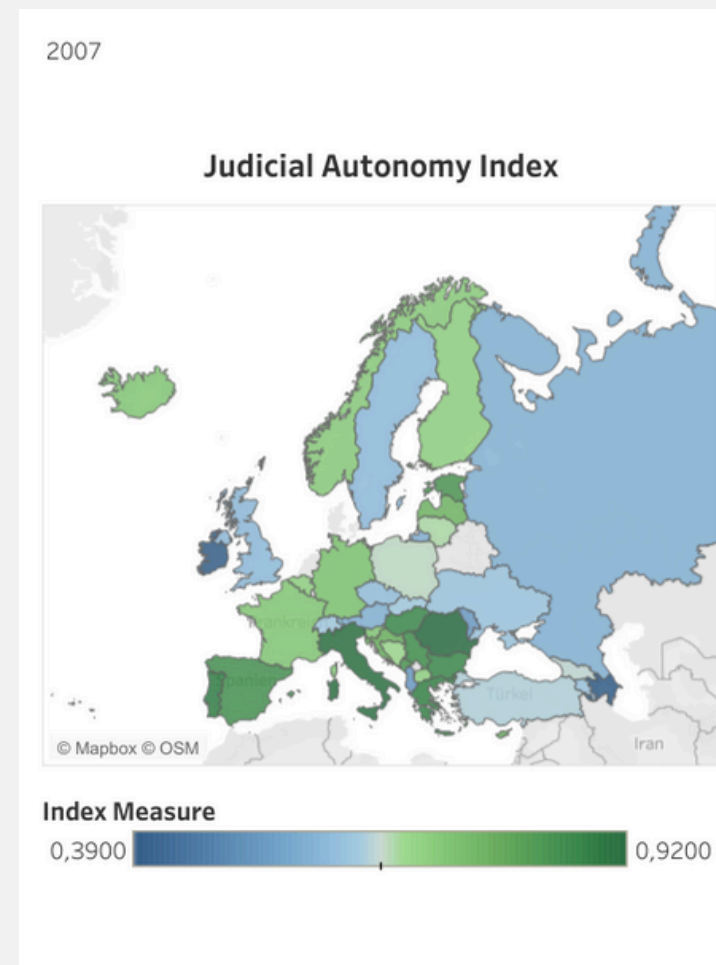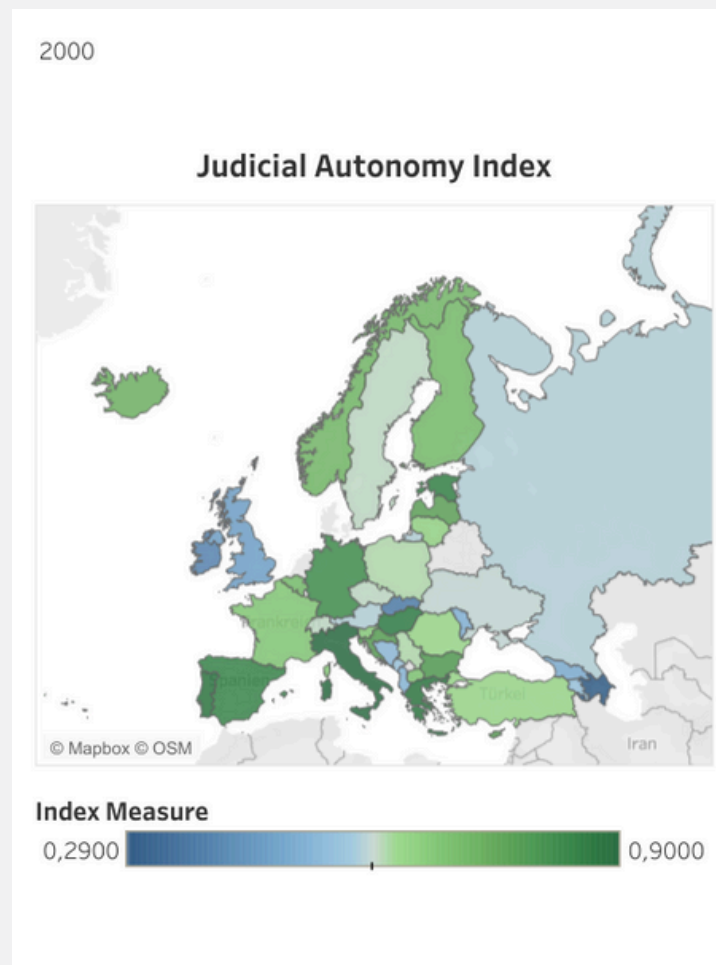- Incl. democracy index [0,1] and regime types classification [0,3]

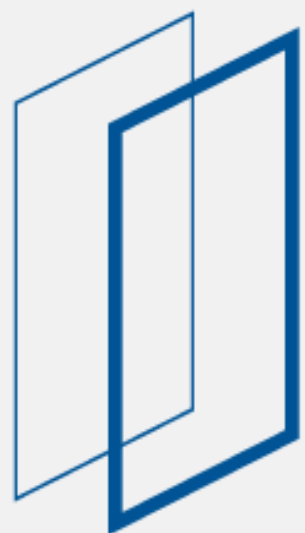Frequency Count of Regime Types across all Years

Data Selection

Judicial Autonomy Dataset (Humboldt-University Berlin)

- Are judges and courts independent from political influence?
- Coded characteristics of 40 European judicial systems for 2000-2022
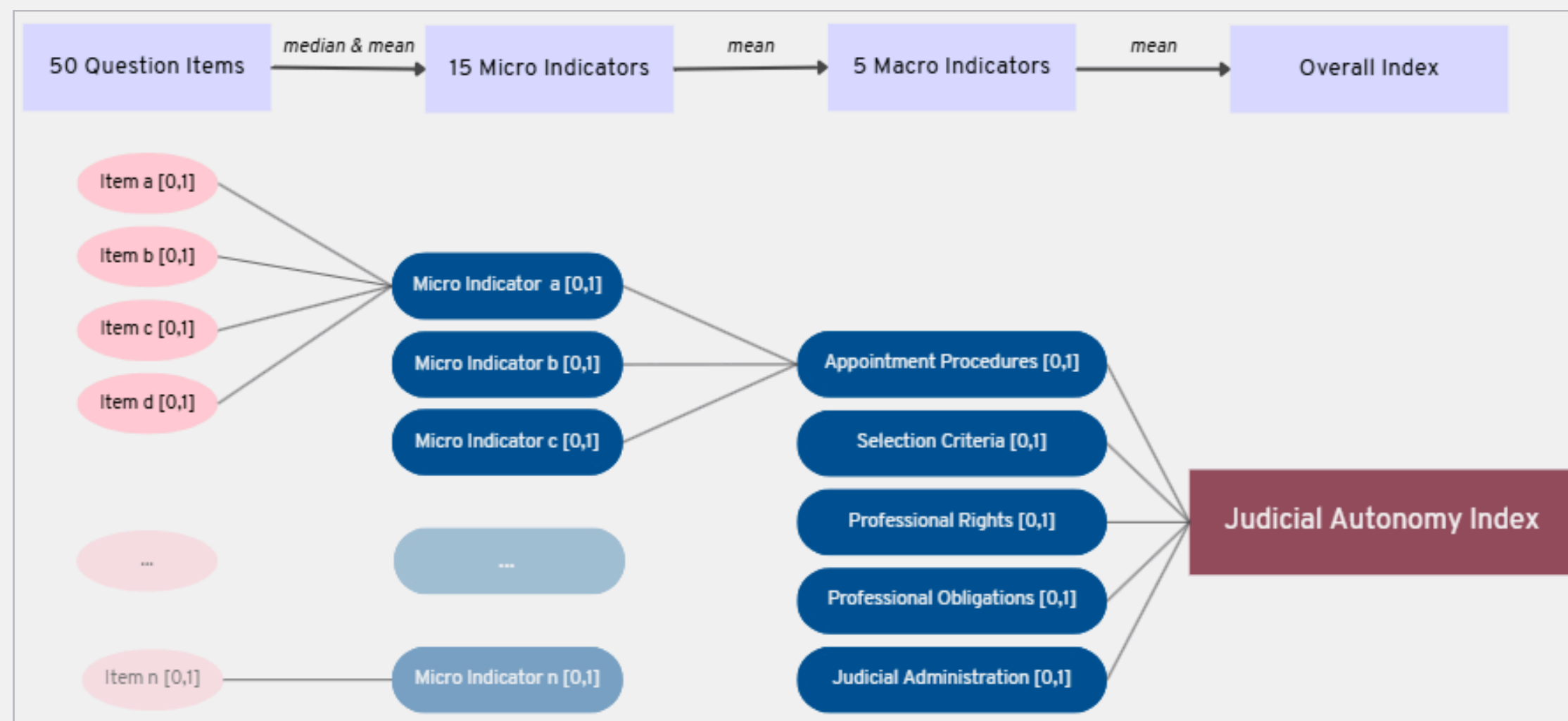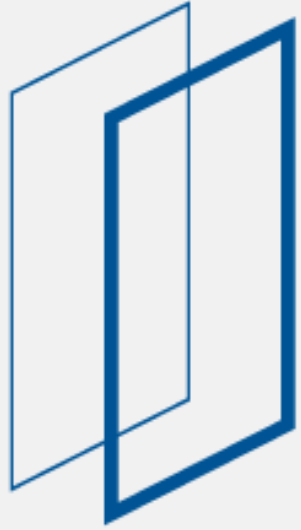
Data Preparation

Index Building:

- Filling in <u>all</u> missing values
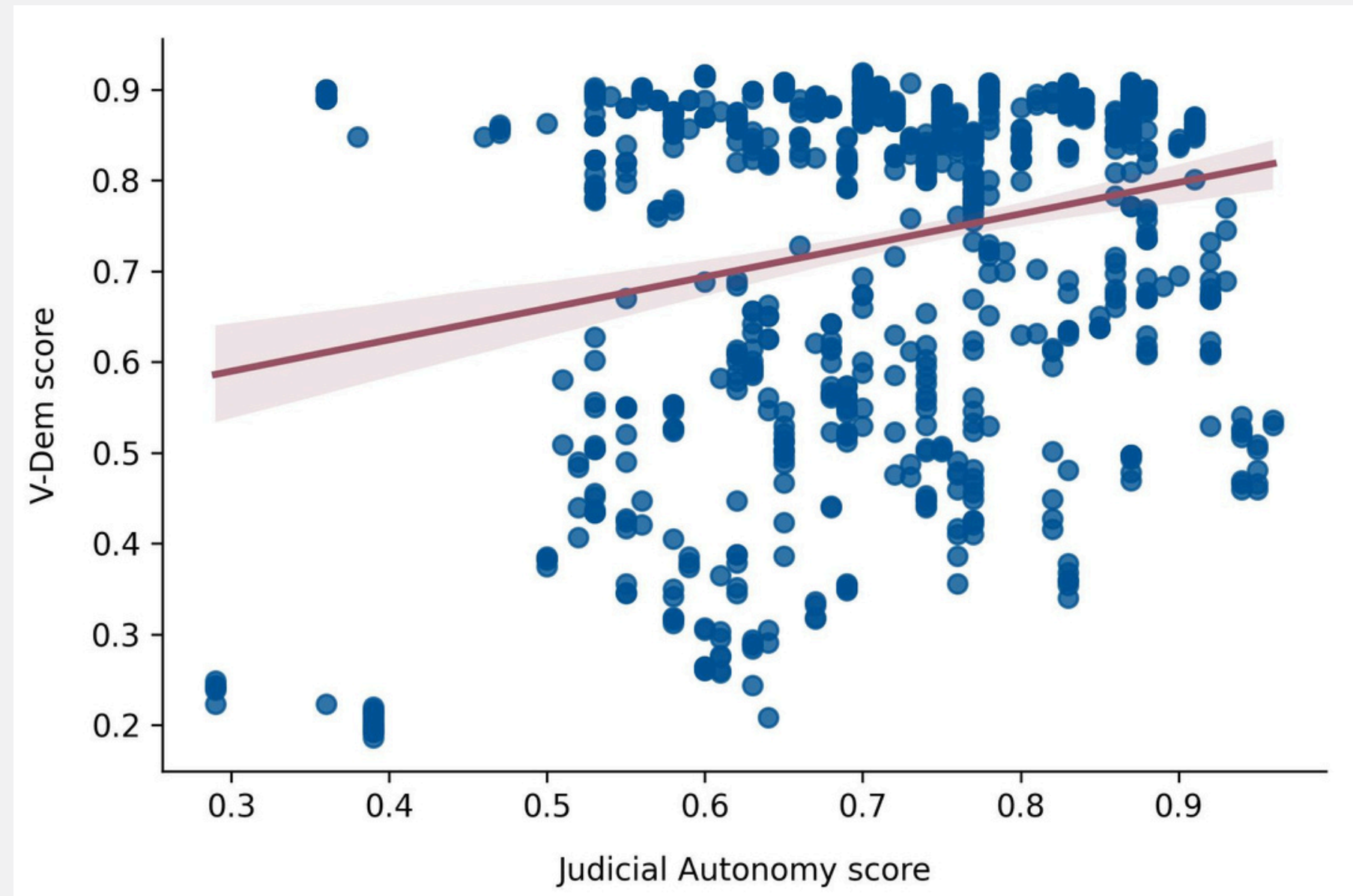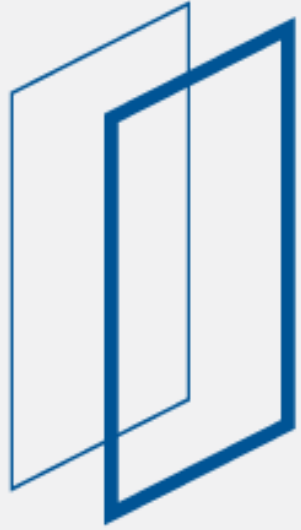- Aggregating data by mode and mean

Democracy vs. Judicial Autonomy

Correlation Coefficients:

- Weak positive linear relationship (Pearson: 0.24)
- Weak positive monotonic relationship (Spearman: 0.11)
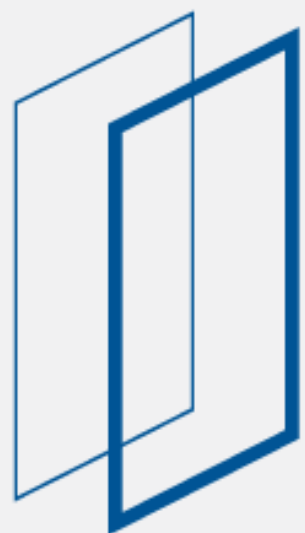
ML Model Building

K-Nearest Neighbors
- Classification and Regression Models
- Manual feature selection, feature scaling, oversampling
- Explore best feature-target combinations (accuracy & R2 > 90%)

Random Forest
- Classification and Regression Models
- Based on pre-selected feature-target combinations
- Identify feature importances

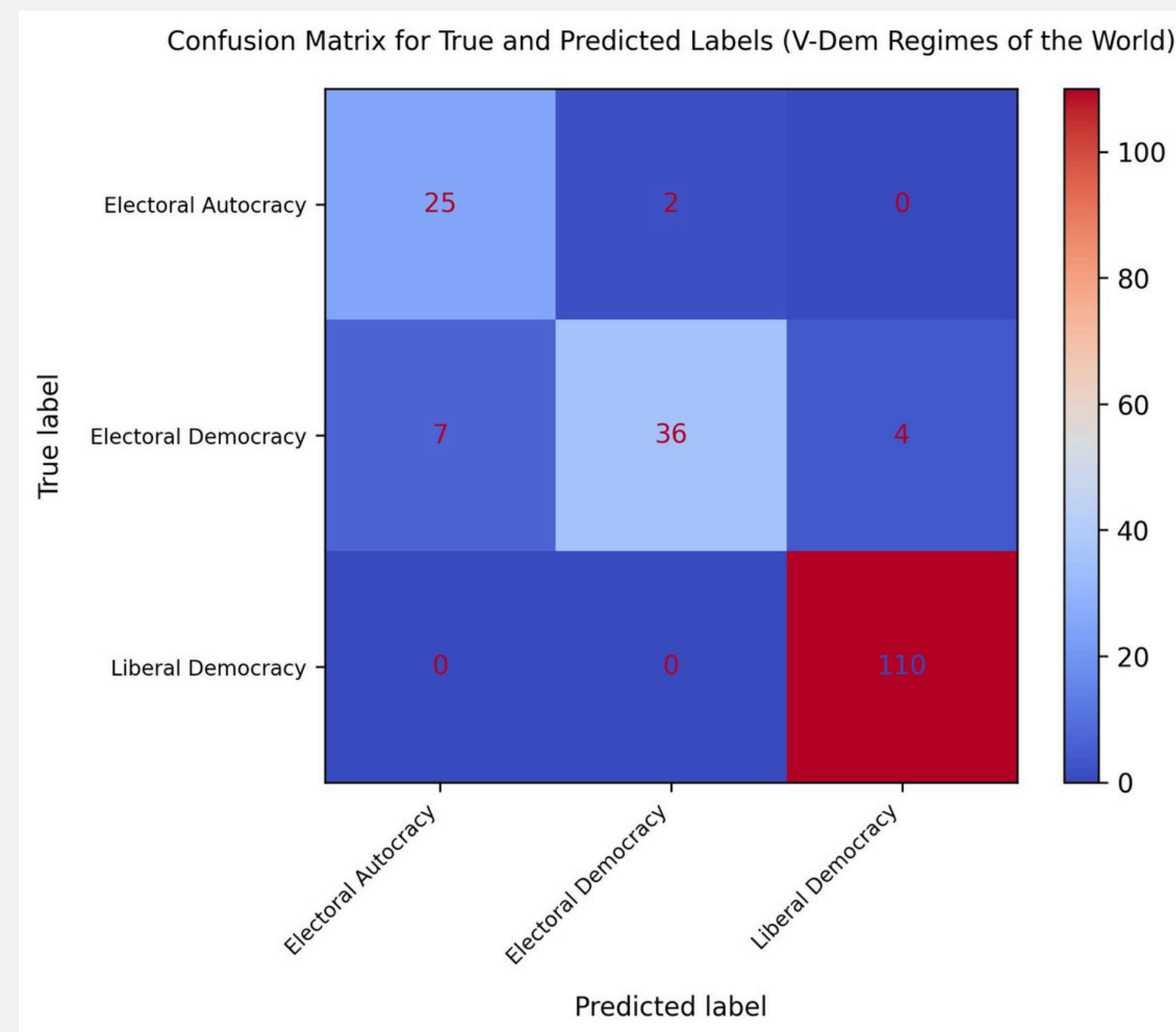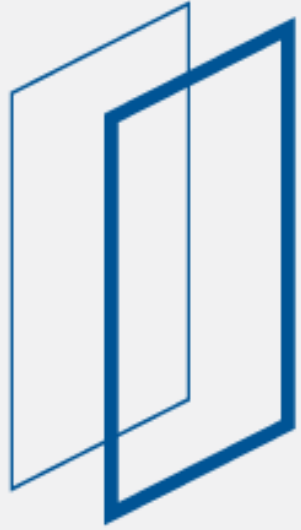| Targets	Features Judicial Autonomy Micro Indicators (15 features)	Judicial Autonomy Macro Indicators (5 features)
V-Dem Regime Types (categorical)	KNNClassifier RFClassifier	KNNClassifier
V-Dem Democracy Index (numerical)	KNNRegressor RFRegressor	KNNRegressor

Random Forest Classifier

Results:

- Strong performance for identifying instances of liberal democracy

Considerations:

- Refinement to correctly identify instances of electoral democracy

	precision	recall	f1-score	support
elect_auto	0.78	0.93	0.85	27
elect_dem	0.95	0.77	0.85	47
lib_dem	0.96	1.00	0.98	110
accuracy			0.93	184
macro avg	0.90	0.90	0.89	184
weighted avg	0.93	0.93	0.93	184

Confusion Matrix for True and Predicted Labels (V-Dem Regimes of the World)
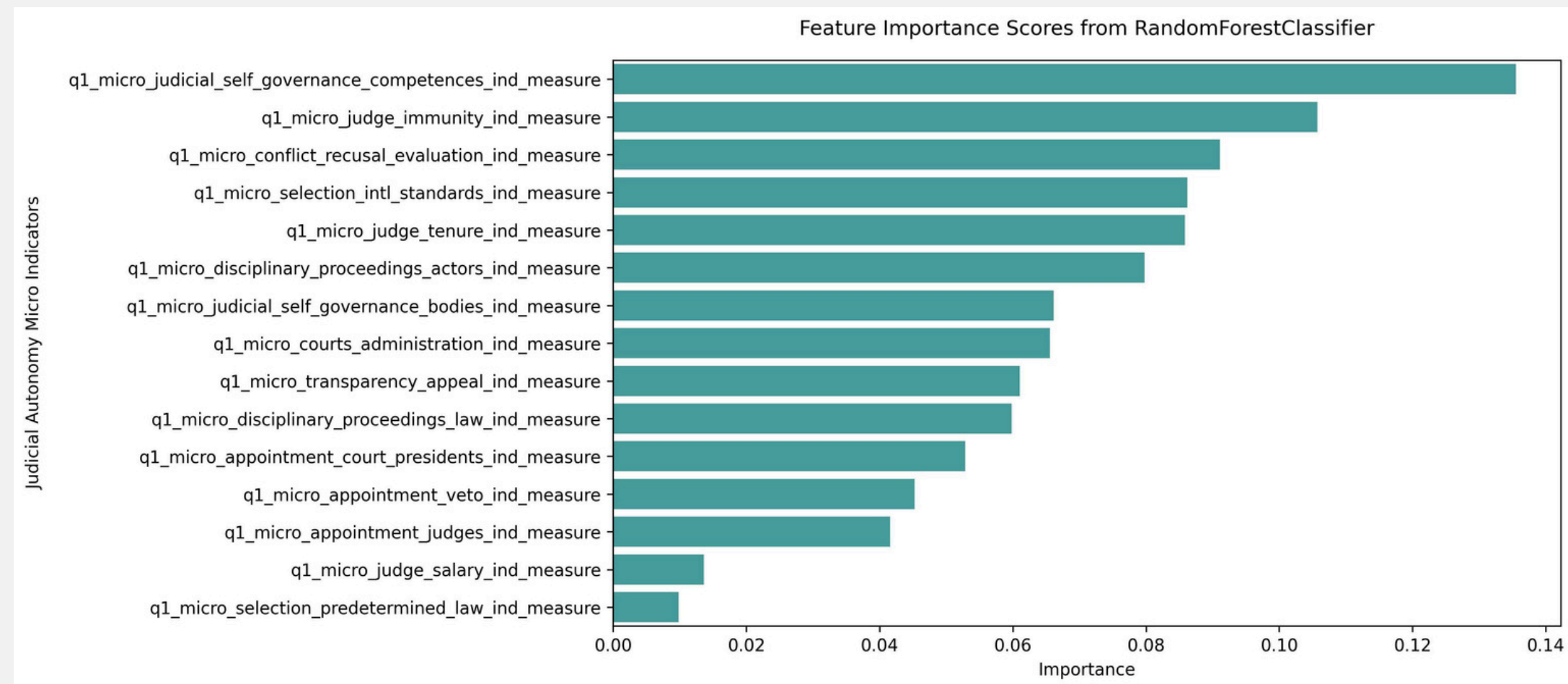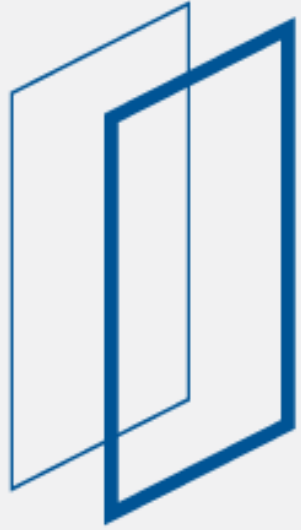
Random Forest Classifier

Results:

- Competences of the judicial self-governance bodies (i.e. bodies that manage and oversee the administration and internal matters of the judiciary) is the most predictive feature for regime type.

Feature Importance Scores from RandomForestClassifier
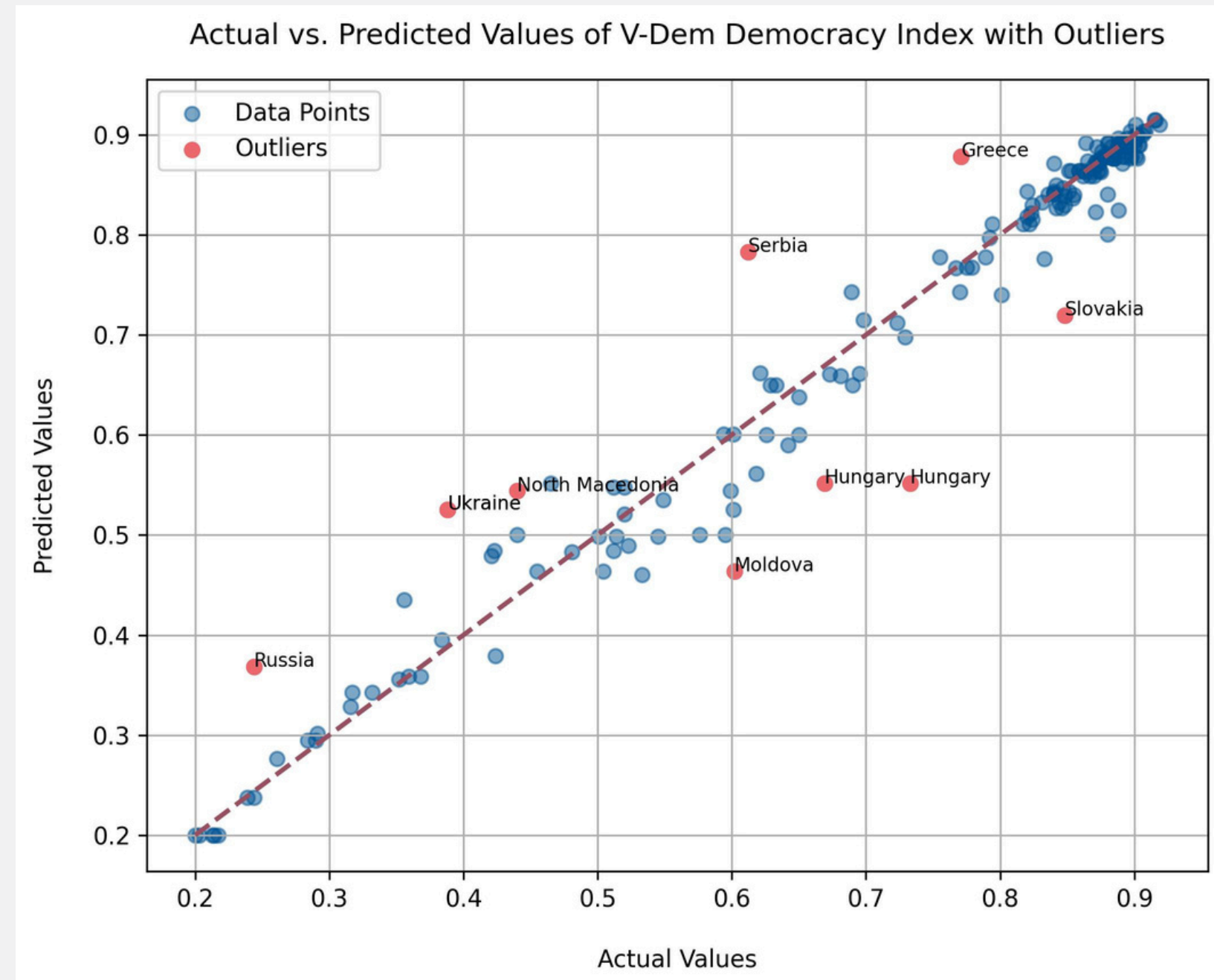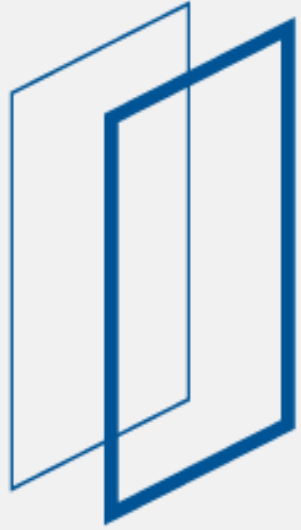
Random Forest Regressor

Results:

- Strong performance when predicting the democracy index measures
- High level of reliability

Considerations:

- Address potential overfitting
- Check generalizability

```
Mean Squared Error: 0.00
Root Mean Squared Error: 0.04
R^2 Score: 0.96
```


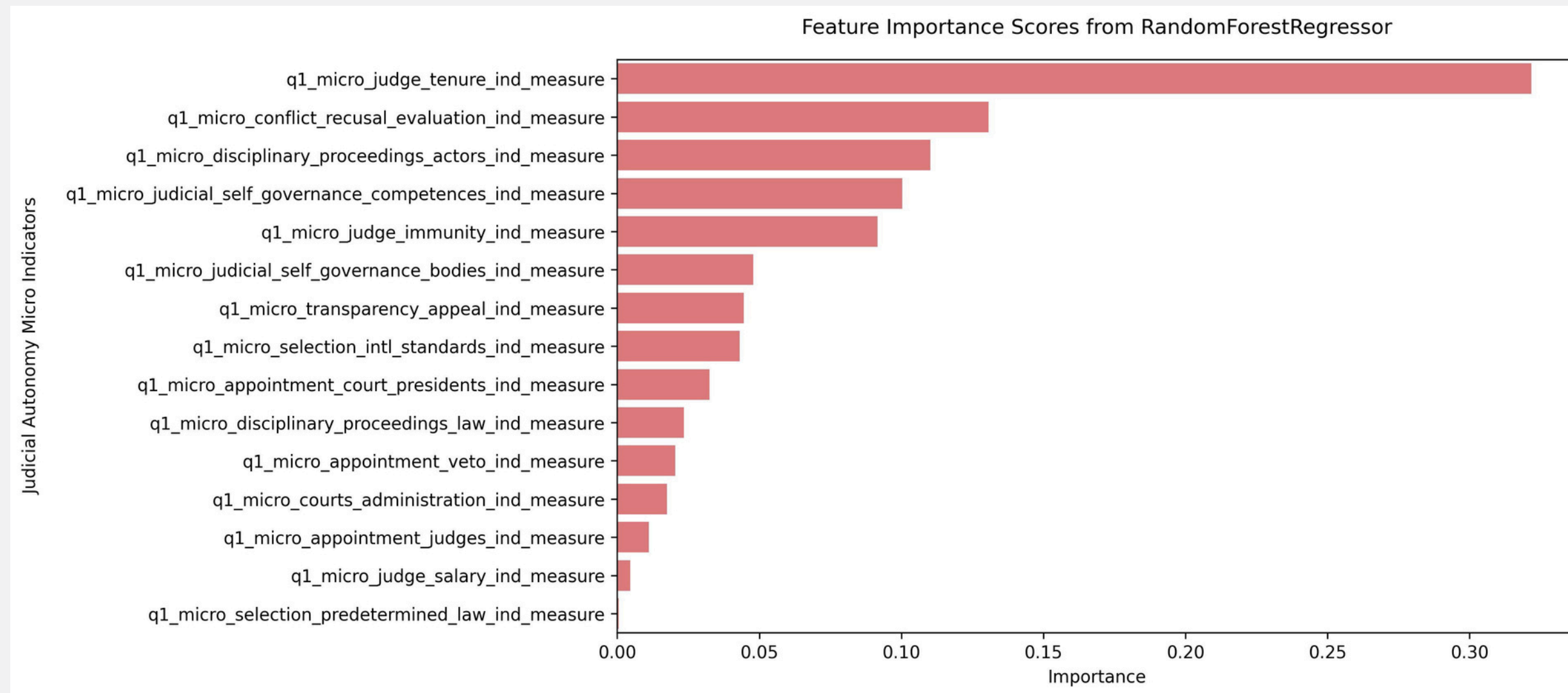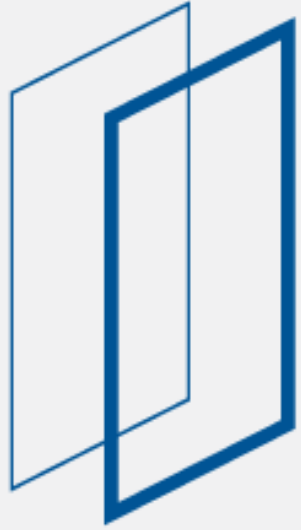Actual vs. Predicted Values of V-Dem Democracy Index with Outliers

Random Forest Regressor

Results:

- Tenure or the term in office of judges is the most predictive feature for predicting democracy index measures.

Feature Importance Scores from RandomForestRegressor

Conclusion

Can written law predict the quality of democracy?

- Weak but recognizable correlation between the quality of judicial independence and the overall quality of democracy.
- Judicial independence can only be <u>one</u> crucial pillar among many.
- Challenges in recognizing the subtle erosion of democracy.

We cannot predict the (political) future, but we can prepare ourselves by:

- Identifying critical elements of judicial systems
- Identifying potential threats to judicial independence and democracy
- Monitoring incremental change
- Refining measures and approaches to capture "middle-ground" cases

Thank you!

Ironhack Data Analytics Final Project -- FINALLY DONE! 😇