Buying Friends?

Modelling Pro-Russian Voting Behaviour in the United Nations General Assembly

Data Science Project by Maria

PROJECT OVERVIEW

Background

Russia´s aggressive international behaviour

Question

What drives other countries to support Russia by voting in line with its interests in the United Nations General Assembly (UNGA)?

Machine Learning Models

Goal is to identify main features of countries that support Russia in UNGA resolutions

Hypothesis

A country's economic ties and dependencies on Russia are the strongest predictor of its voting alignment with Russia in the UNGA

Data

Dataset

- 192 rows (based on UN members) and 12 columns
- Self-constructed from different sources (UN voting data, OECD, UNCTAD etc.)

Target

- **Pro-Russian Voting Index:** continuous values between 0 and 1
  35 UNGA resolutions crucial for Russian foreign policy (Ukraine, Georgia)
  Timeframe 2008-2023, coding: support = 1, against = 0, abstentions/absences = 0.5,
  Index per country based on arithmetic mean (sum values/ number resolutions)

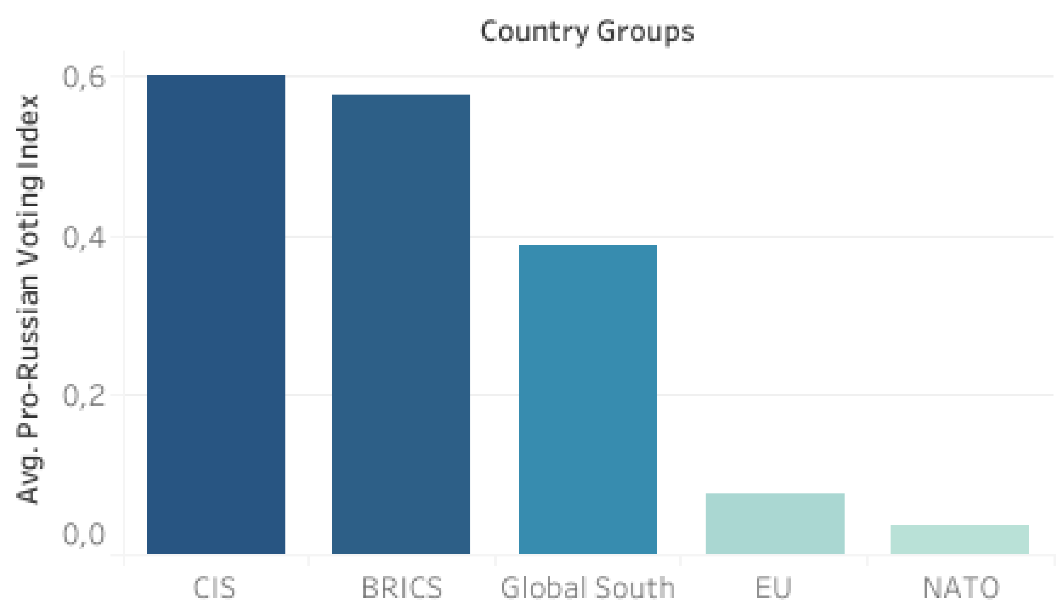
Features (for each UN member)

- **Economic**: Mean Russian Aid Amount per Year ($ MM), Bilateral Investment Treaty with Russia (0/1), Export and Import Partner Share with Russia, GDP per capita ($)
- **Other**: Regime Type (democratic/authoritarian), Distance to Moscow in km, Comecon Membership (0/1), Defense Cooperation Agreement with Russia (0/1), Membership in Organisation with Russia (0/1)

Exploratory Data Analysis

Analysing Pro-Russian Voting Behaviour in the United Nations General Assembly (UNGA)

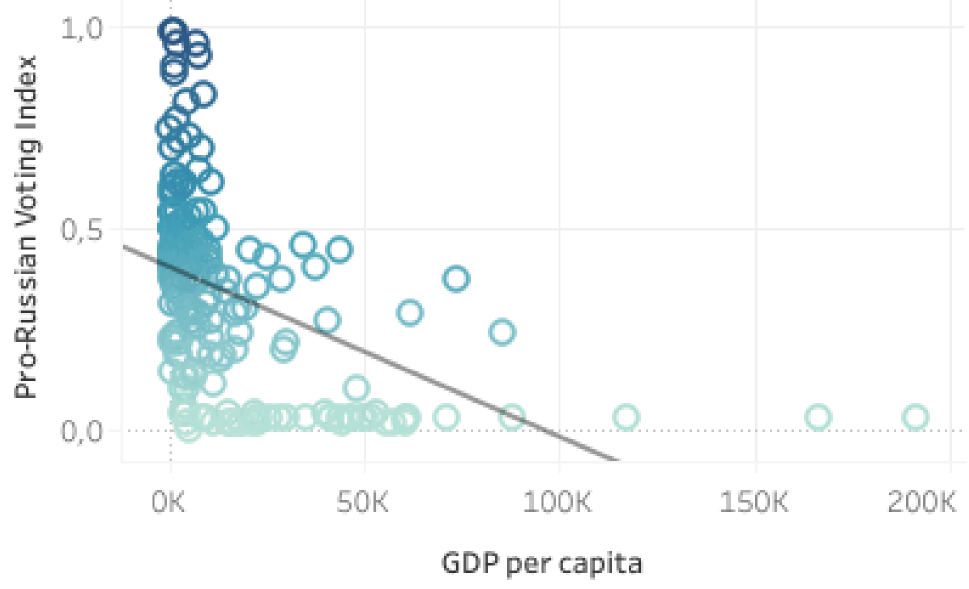
Pro-Russian Voting by Country Groups



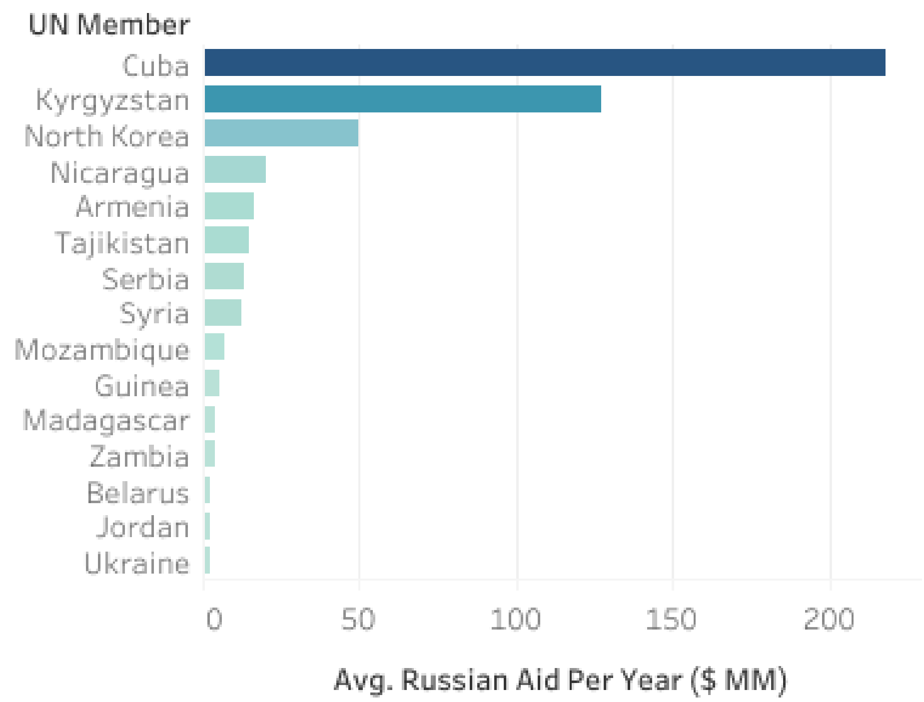
Top 15 Countries by Pro-Russian Voting Index

UN Member	
Syria	0,9857
North Korea	0,9857
Nicaragua	0,9571
Belarus	0,9571
Cuba	0,9286
Zimbabwe	0,9000
Sudan	0,8857
Venezuela	0,8286
Armenia	0,8143
Laos	0,7714
Burundi	0,7429
Iran	0,7286
Viet Nam	0,7143
Eritrea	0,7000
China	0,7000

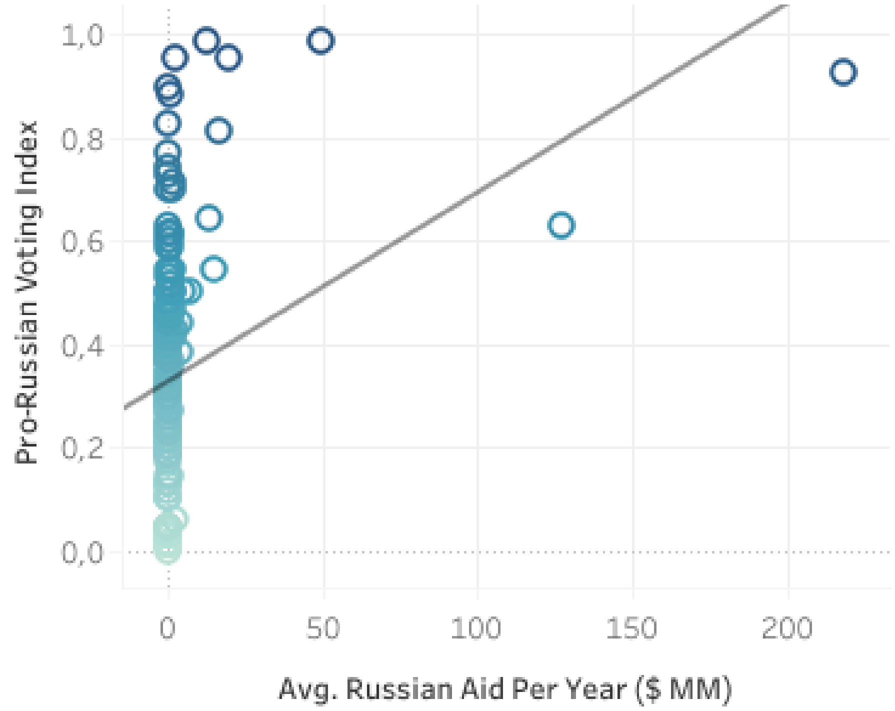
GDP Per Capita vs. Pro-Russian Voting



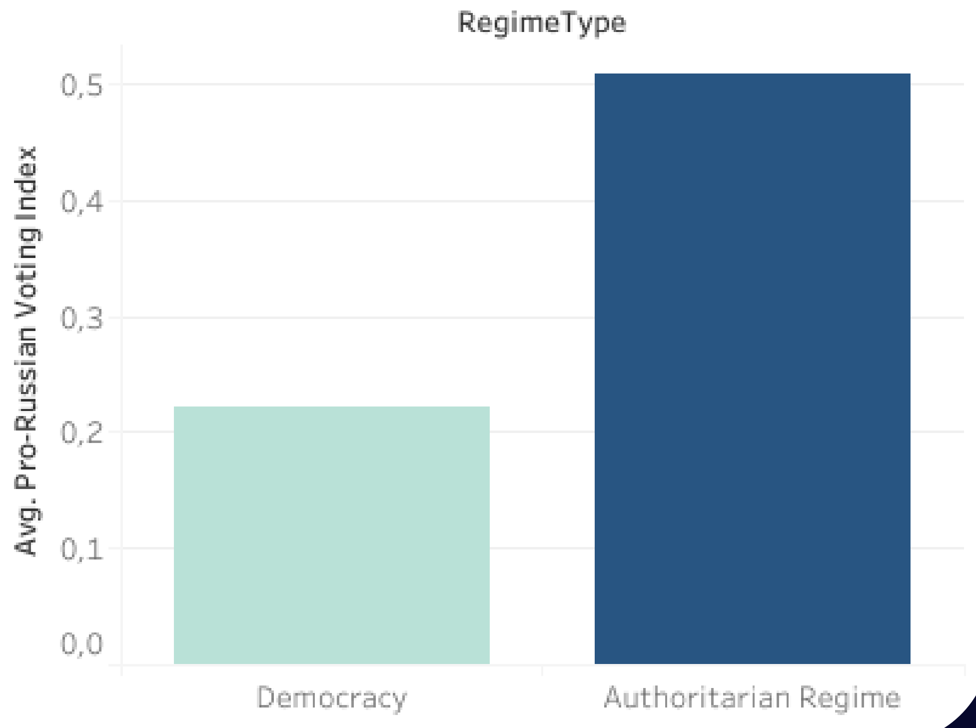
Top 15 Receiver Countries of Russian Aid



Receiving Russian Aid vs. Pro-Russian Voting



Average Pro-Russian Voting by Regime Type



DATA PREPARATION

Problem

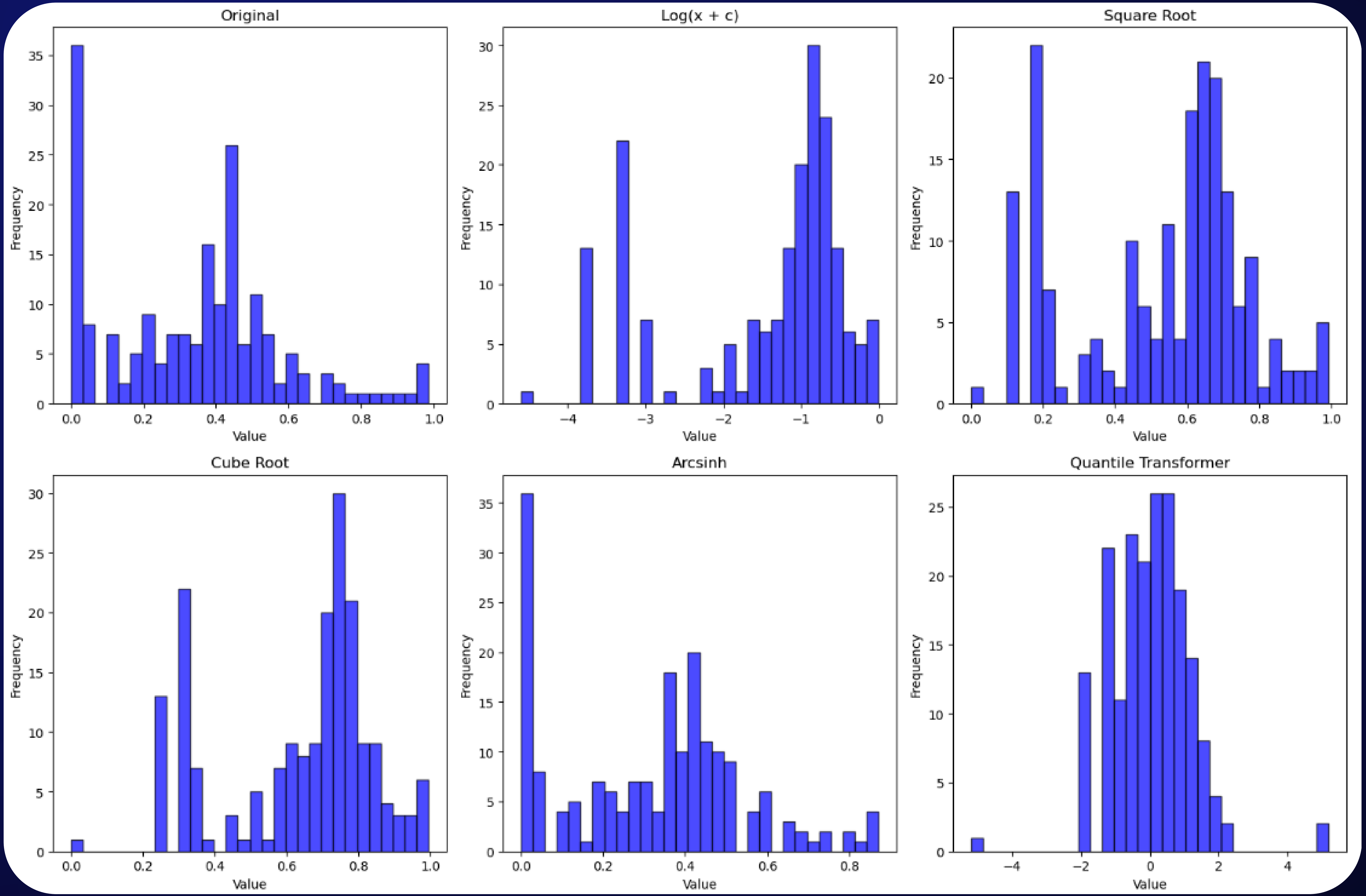
- Target Pro-Russian Voting Index not normally distributed

Solution

- Quantile Transformer most normal distribution

Trade-Off

- Predictions can be back-transformed but coefficients not interpretable in original scale anymore



Feature Selection & Engineering

Low Correlation with Target < 0.1

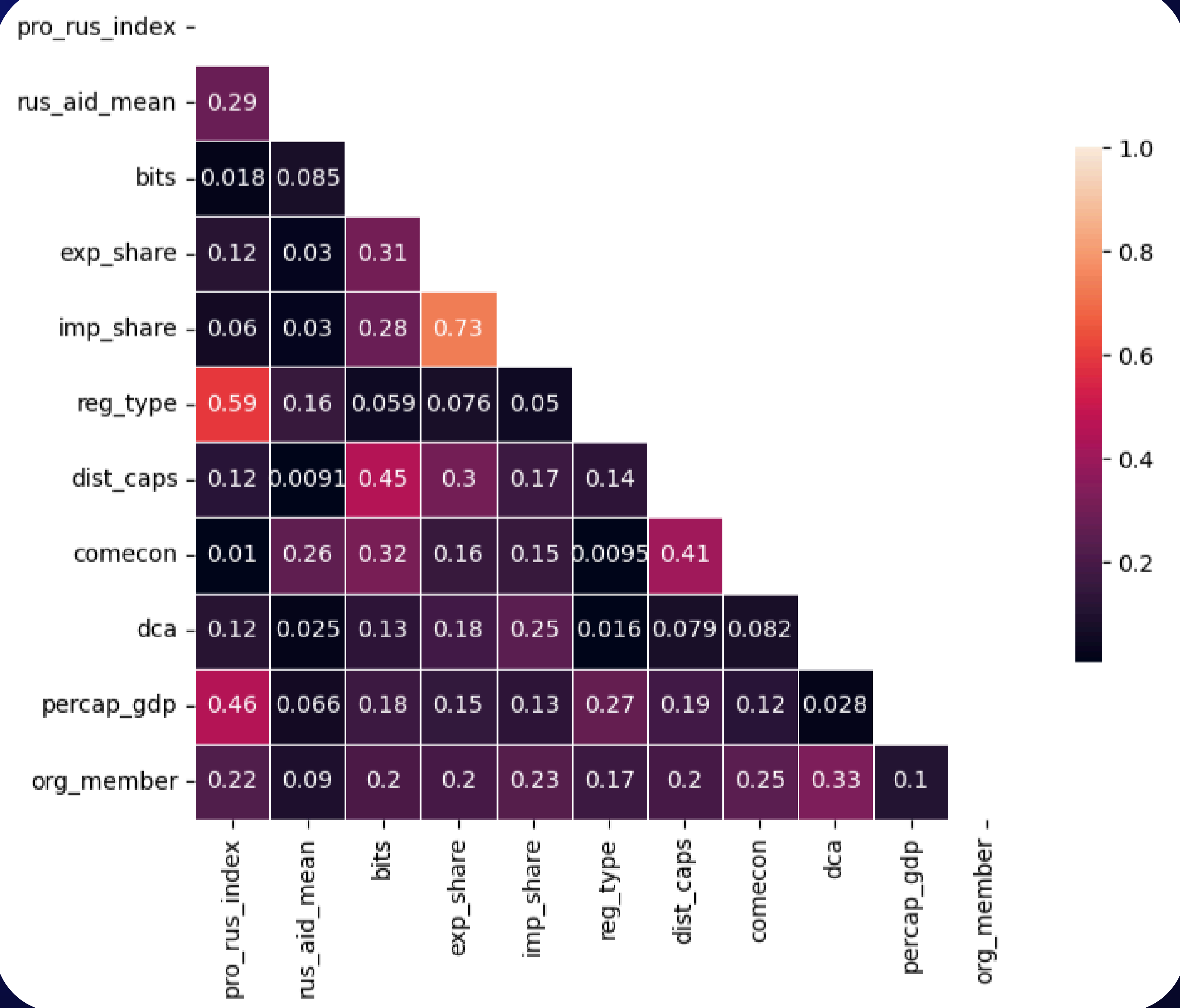
- Bilateral Investment Treaty
- Comecon Membership
- Import Partner Share

High Feature Correlation

- Import and Export Partner Share
- Already dropped Import

Feature Engineering

- Normalization of features for distance-based ML models due to big difference in values (GDP per capita, distance to Moscow etc.)



OVERVIEW OF MODEL PERFORMANCE

Distance-Based Models with normalized features and transformed target

Model	R^2	Cross-Validation R^2
KNN	0.50	0.42
Linear Regression	0.32	0.28

- Performance drop after cross-validation indicates that the models were not generalising well before due to the quite small dataset with features that vary a lot for every country
- Selected random state 42 performed better than the average of multiple train/test splits

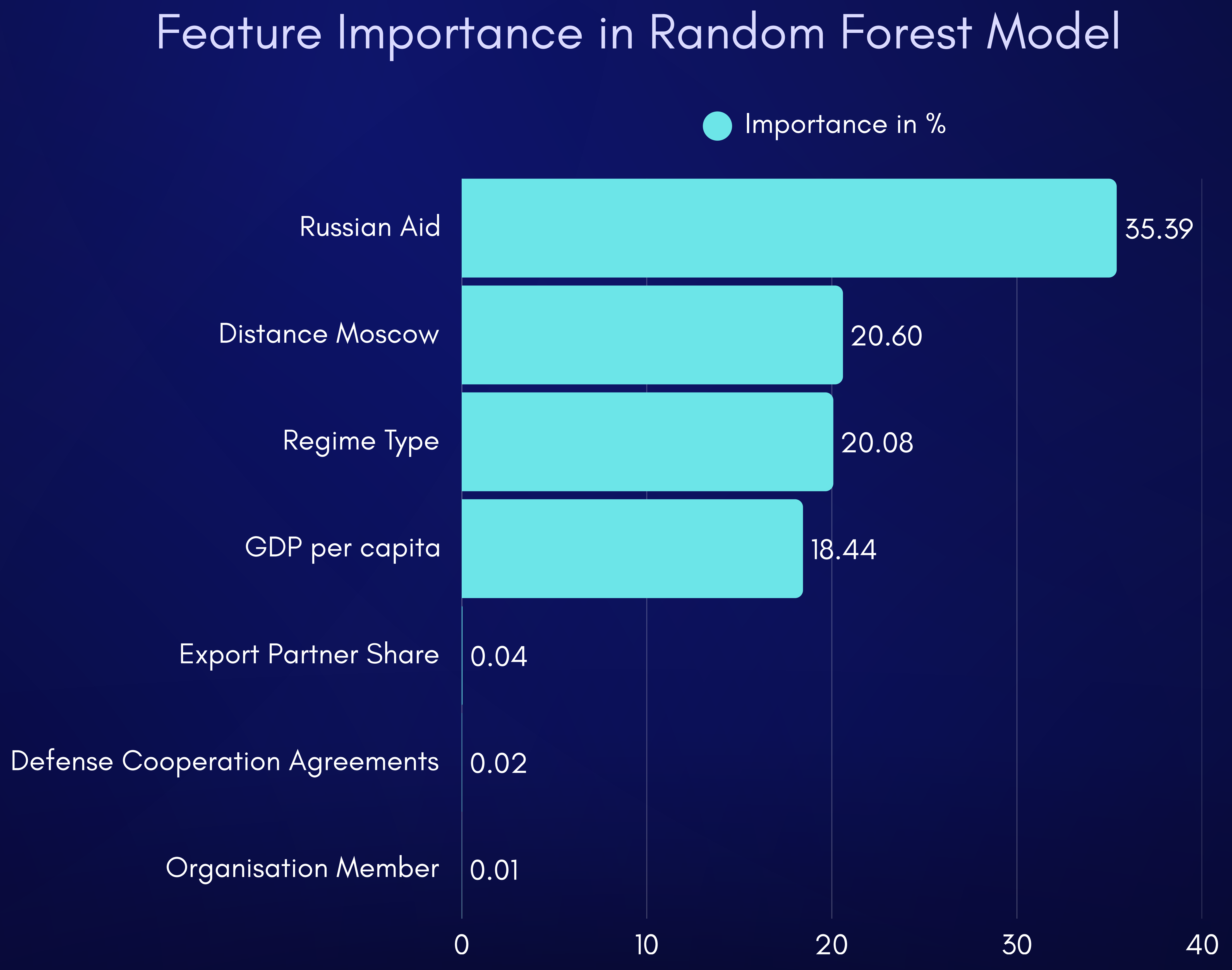
OVERVIEW OF MODEL PERFORMANCE

Decision Tree and Ensemble Methods

Model	R^2	Cross-Validation R^2
Decision Tree	0.65	0.36
Random Forest	0.61	**0.56**
Ada Boost	0.54	0.53
Gradient Boost	0.46	0.51

Since performance drop legitimate – best model Random Forest with R^2 of 0.56

Key findings



Limitations & Future work

Explaining vs. Predicting

- Focus rather on *explaining features* that lead to outcome than training a model to be able to predict the outcome itself
- Models do not have much application in making actual predictions because no new "rows" expected (new countries joining UN)
- Only if country characteristics change, do the predictions change

Model Performance

- R^2 of 0.56 indicates room for improvement – missing features?
- Future work could include additional features which matter for predicting Pro-Russian voting (requires theoretical research before model building)

Methods

- Trying more advanced models?
- Using Time-series data?

Conclusion

Four Important Features in Pro-Russian Voting Identified

- **Russian Aid**: Countries that receive more development assistance from Russia, on average have a higher Pro-Russian Voting Index
- **Distance to Moscow**: Russia on average receives the most voting support from countries that are located further away
- **Regime Type**: Authoritarian countries on average have a higher voting alignment with Russia than democracies
- **GDP per Capita**: Countries with a lower GDP per capita on average tend to support Russia more in the UNGA than countries with a higher GDP per capita

Evidence for Hypothesis Found

- Import and Export Partner Share & Bilateral Investment Treaties not relevant (economic ties)
- Receipt of Russian Aid most important feature & GDP per capita important (dependencies)
- Economic dependencies on Russia are the strongest predictor for voting alignment with Russia in the UNGA - Russia indeed seems to be buying friends

Thank You

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