

Estimating Refugee Impact

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01

Context





What is a refugee?

Refugees are people who have fled war, violence, conflict or persecution and have crossed an international border to find safety in another country.



On February 24, 2022 Russia invades Ukraine

In an escalation of hostilities that began in 2014, the invasion is the largest military assault in Europe since World War II:

- At least 20k dead
- \$119B in property damage
- Approximately 10M displaced

*from Reuters as of March 23, 2022





March 20, 2022

3.7M refugees have fled Ukraine .



Where are they going?

Poland

2,083,854

Slovakia

250,036

Hungary

312,120

Romania

535,461

Belarus

3,765

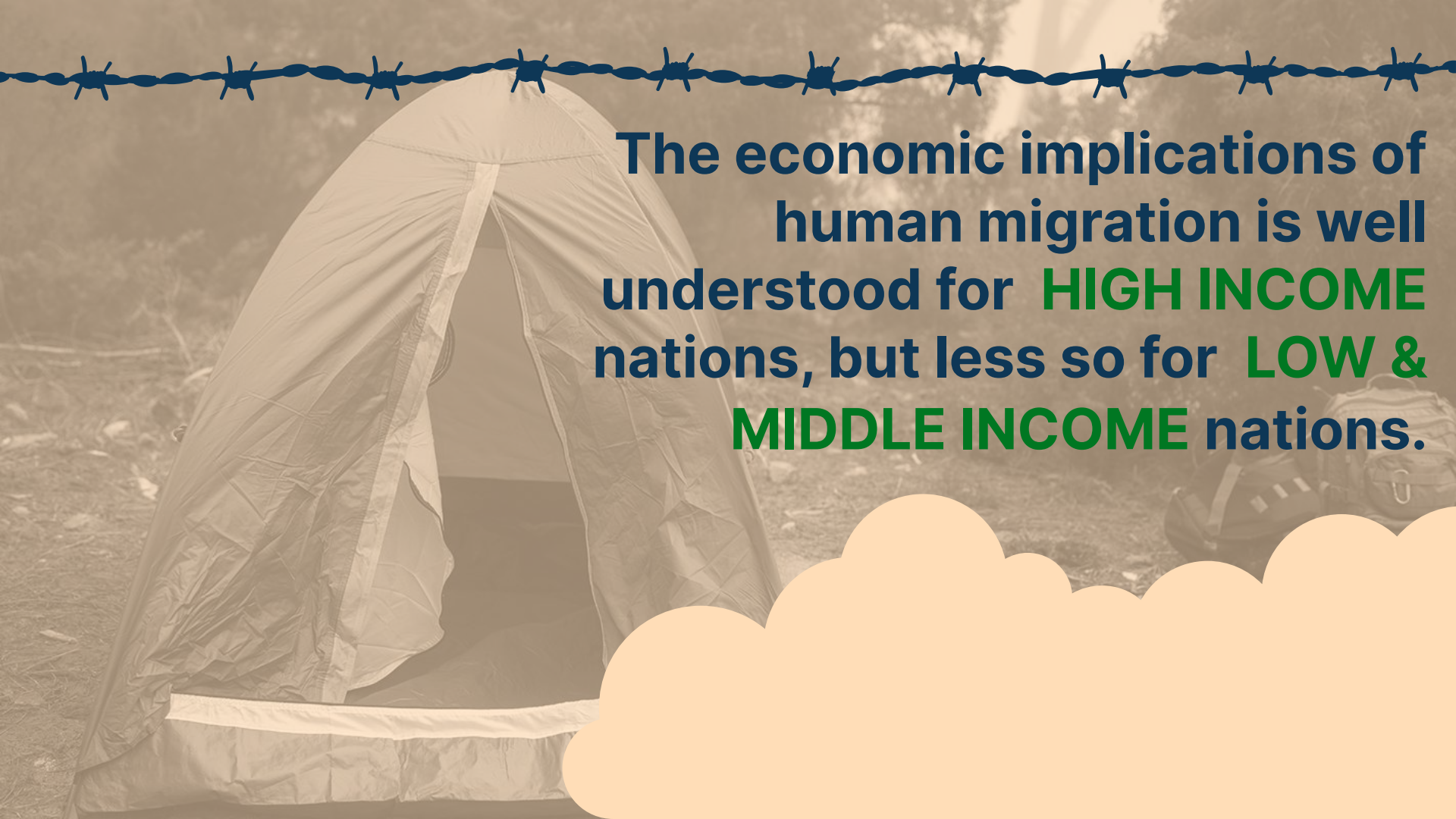
Russia

231,764

Moldova

365,197





The economic implications of human migration is well understood for **HIGH INCOME** nations, but less so for **LOW & MIDDLE INCOME** nations.



Problem Statement:

Using UN / World Bank data, can we estimate the financial impact to host countries of Ukrainian refugees in a way that could also be replicated in the low and middle income countries?





02

Data

Criteria for Data

Readily Available

Across the globe, and every year

Transparent Sources

Verifiable, similar gathering techniques

Standard Definitions

Recognized and agreed upon globally



World Bank

Five Institutions, One Group



4 Years of data

31 data features

- Not including GPD (our target)

148 countries



03

Modeling



Regression Modeling

Features	Removed GNI Growth, Country, Year
Models	Linear, Bagging, Random Forest, Lasso, Ridge, AdaBoost, Decision Tree, KNN
Target	Annual GDP Percentage Change





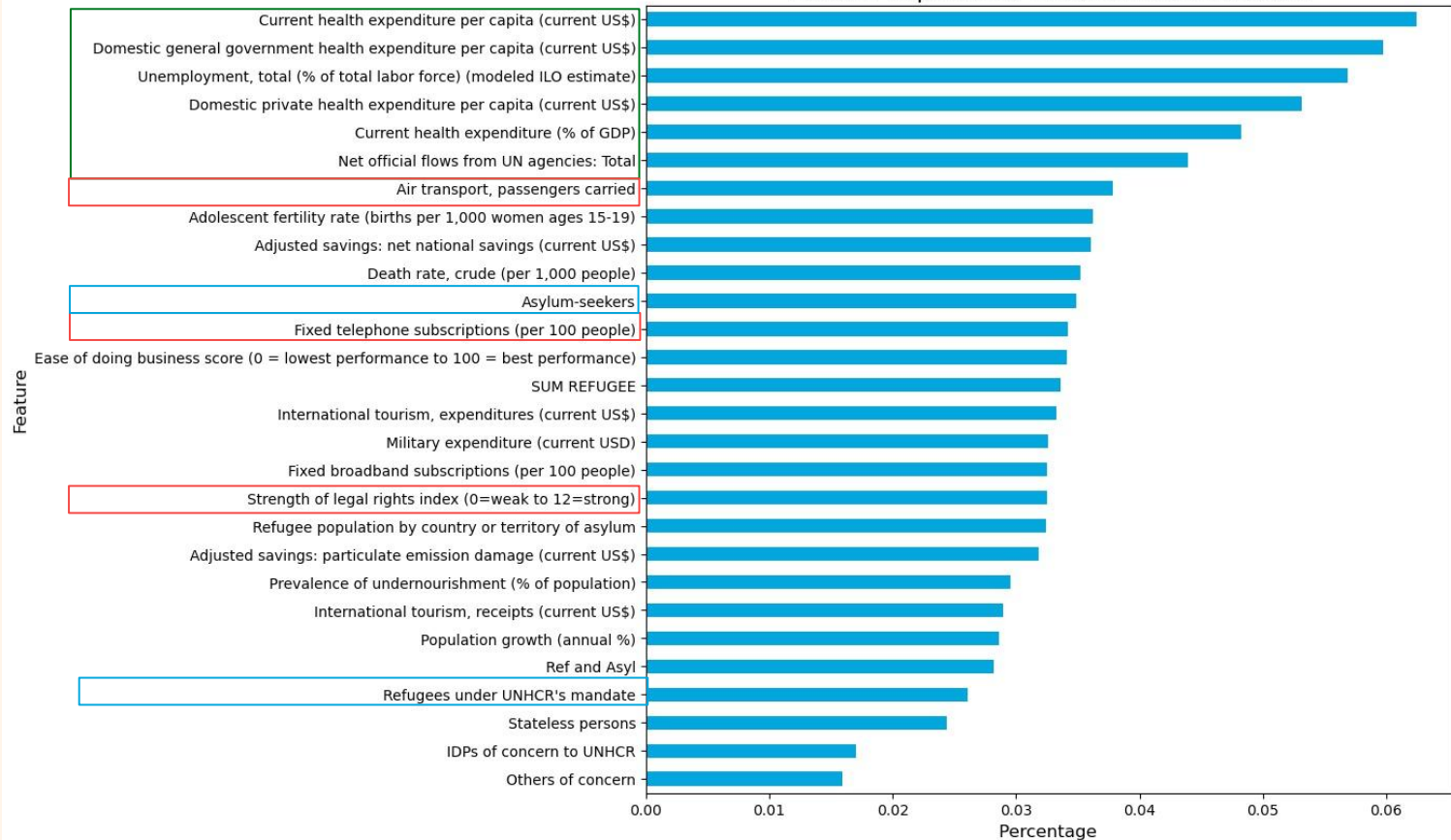
Random Forest

38.65% of the variance can be explained
with the Random Forest model.



Feature Importance

Feature Importance in Random Forest Model







04 Conclusion



Ukrainian Refugee Host Country Annual GDP Percentage Change Predictions



Country	Refugees under UNHCR's mandate	GDP Annual Change Prediction
Poland	2,083,854	3.36%
Romania	535,461	3.41%
Hungary	312,120	3.74%
Slovakia	250,036	3.05%
Russia*	231,764	2.45%
Belarus	3,735	2.38%

Our conclusions



Limitations

Lack of available data,
time constraints.



Move Forward

Acquire more data
including features and
countries.



New Model

Time Series Exploration





05



Recommendations





Next Steps



Time

Features

Countries



Acquire additional years worth of data and fill existing datasets

Identify features with possible economic implications

Apply this model to Low and Middle Income countries.



Thanks!

Do you have any questions?

“The blood and tears of children, the suffering of women and men who are defending their land or fleeing from bombardments shakes our conscience”

—Pope Francis

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