Global Black Money Transactions: Unmasking Financial Crime

Analyzing suspicious transactions across countries and industries.

By: Jack Brooks, Trent Bazemore, Jack Dillard, Jacob Edwards

Dataset Overview

1 Time Period

14 months: December 2012 to February 2014

2 Scale

10,000 instances, 14 attributes

3 Key Variables

Source (Illegal, Legal), 10 countries, amount (USD), and industry

World Country GDP Dataset

Key variables: GDP_USD & GDP Per Capita

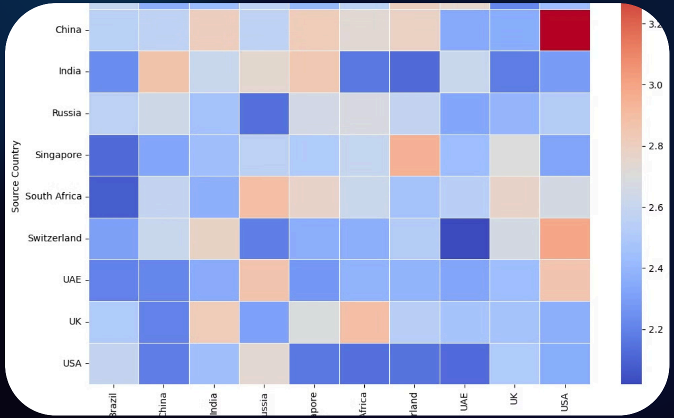
Dimensionality: 16492 instances by 5 variables

Combined with previous dataset joined by year and country (inner join)

Money Flow

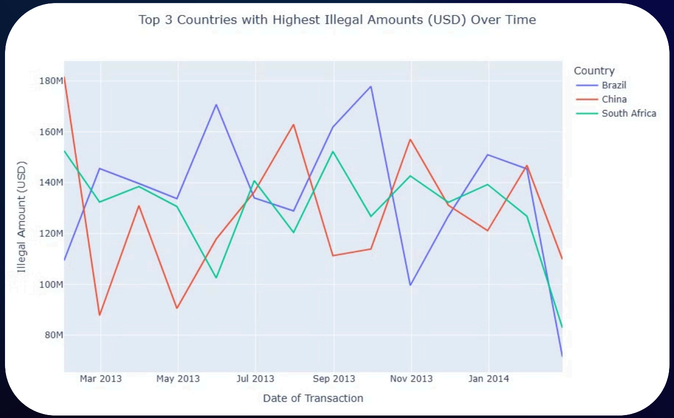
Global Transactions

Illustrating the movement of funds across countries.



Currency Exchange

Highlighting the exchange of funds between different currencies. China has the highest exchange with the USA



Financial Networks

Showing the top 3 highest income (USD) countries in our Dataset

Research Questions

Main Question: What factors are key indicators in determining fraudulent activities?

1. **Suspicious Activity Origins**

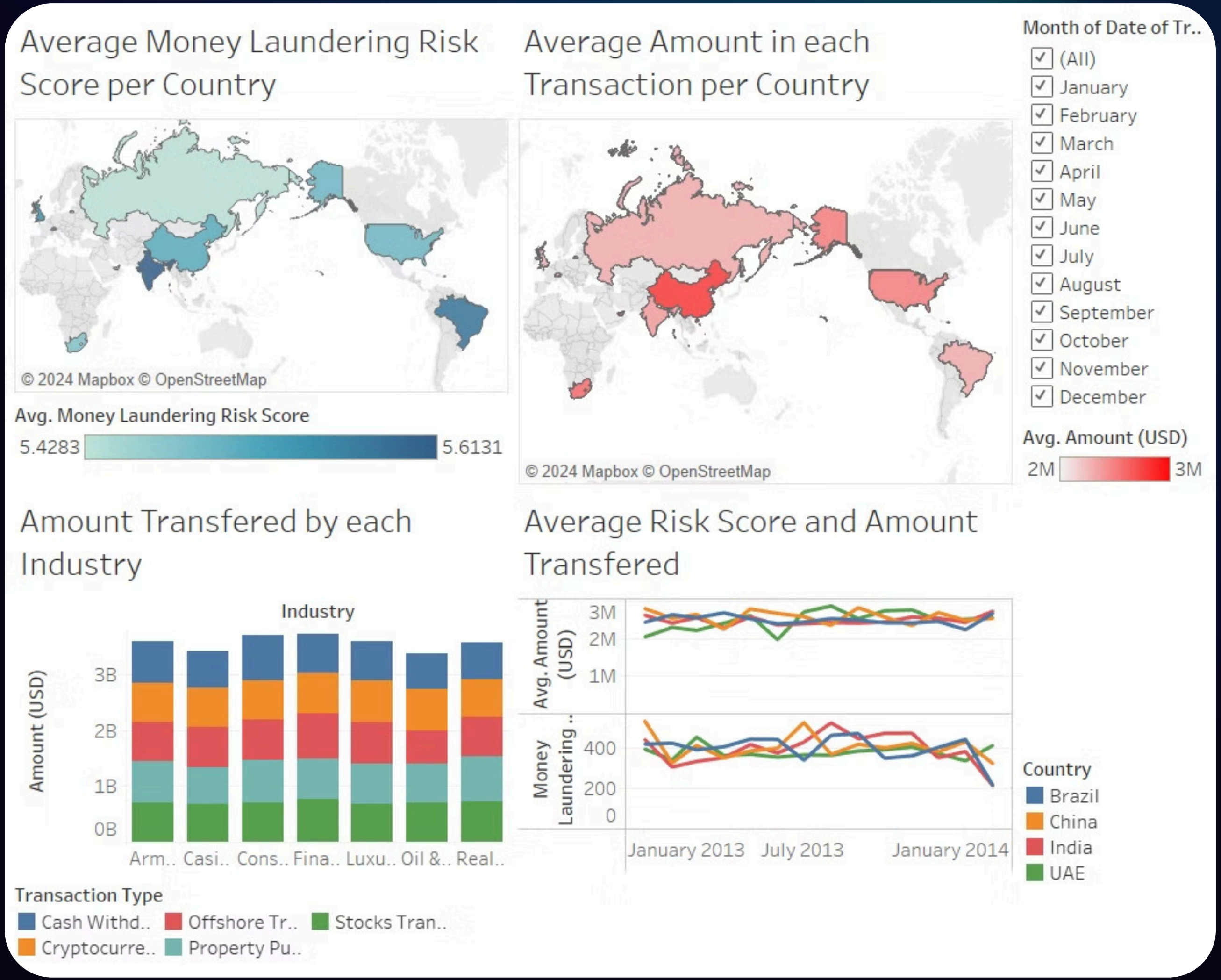
   Identify countries with highest fraudulent transactions

2. **Amount of Money Moved**

   Locate primary destinations for laundered funds

3. **High-Risk Industries**

   Pinpoint sectors with elevated money laundering rates



Trying to Answer These Questions

Choropleth of Illegal Money Count

Google Docs

Recording 2024-12-03 184248.mp4

Choropleth Map by month of the Illegal transactions happening

Brazil and South Africa have the highest count of illegal transactions.

Bar Graph of Illegal Money vs. GDP

Google Docs

Recording 2024-12-03 233418.mp4

This bar graph visually compares the amount of illegal money transactions with the GDP of different countries. Noticeably, South Africa and Brazil show a disproportionately high volume of illegal transactions relative to their GDP.

Classification Model Overview

Random Forest

Accuracy: 0.6975

AdaBoost

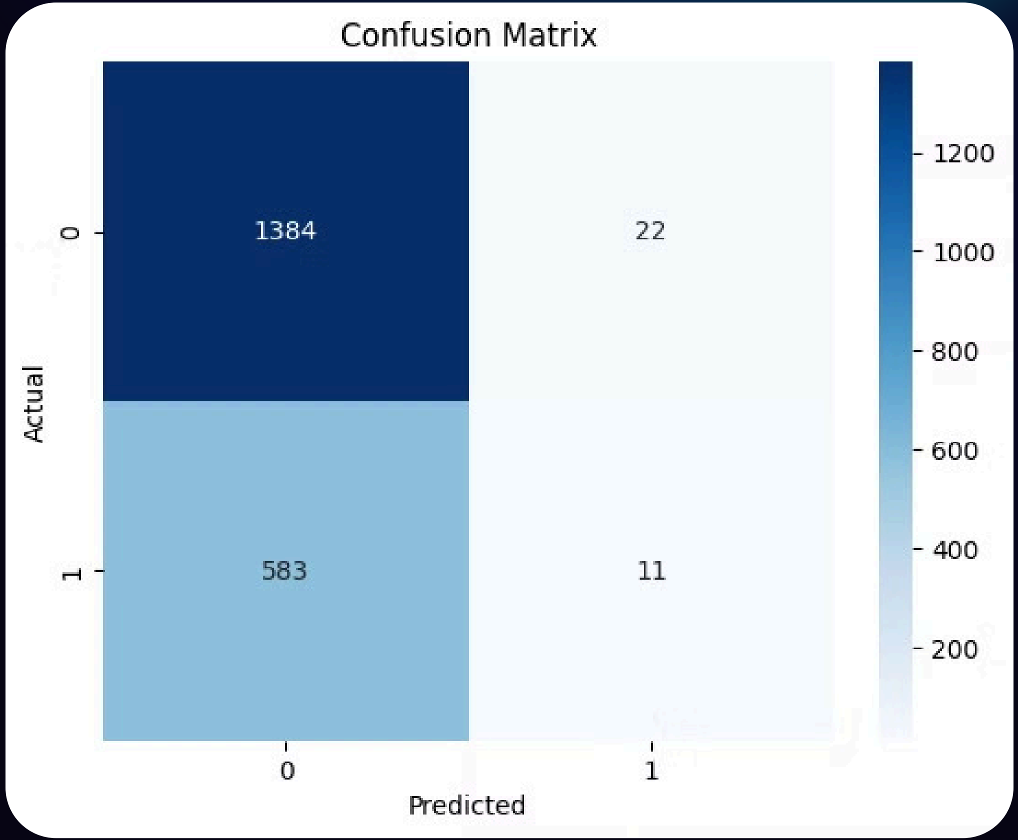
Accuracy 0.703

Gradient Boost

Accuracy 0.701

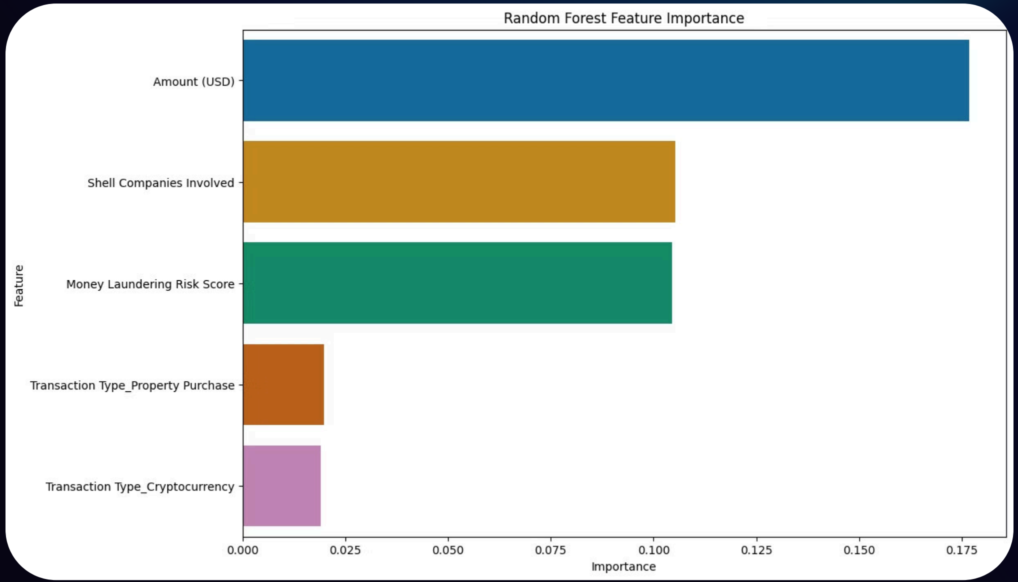
Support Vector

Accuracy 0.703



How did the model do?

Predicts the illegal transactions well but completely misclassifies the legal transactions.



Key Findings

When doing a feature importance on the model the top 3 characteristics for prediction are Amount of Money, Number of Shell companies used, and the Risk score of the money laundering

References

Hendriyetty, N. and Grewal, B.S. (2017), "Macroeconomics of money laundering: effects and measurements", Journal of Financial Crime, Vol. 24 No. 1, pp. 65-81. https://doi.org/10.1108/JFC-01-2016-0004

Tertychnyi, P., Godgildieva, M., Dumas, M., & Ollikainen, M. (2022). Time-aware and interpretable predictive monitoring system for Anti-Money Laundering. Machine Learning with Applications, 8, 100306. https://doi.org/10.1016/j.mlwa.2022.100306