WHAT MAKES A STRONG GDP?

Created by Rtists

Data & Goals

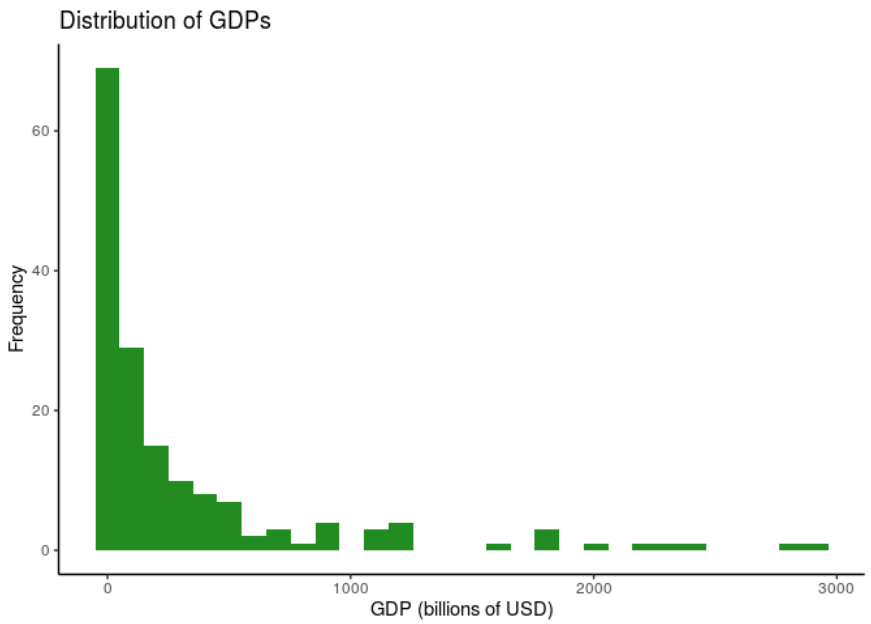
Data

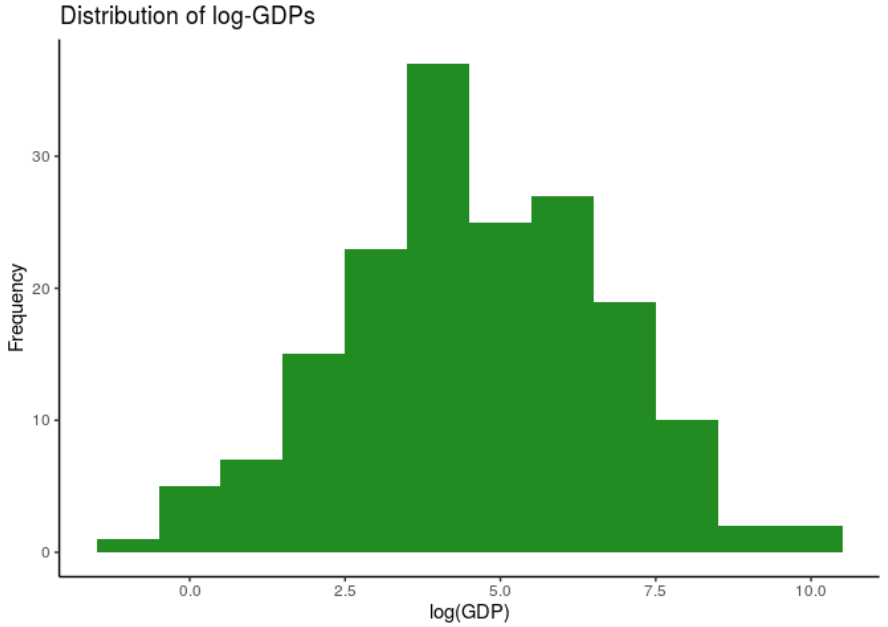
- 185 countries
- 16 variables (3C, 13N)
- Collected in 2019
- 12 countries omitted due to poor data collection policies

Goals

- Determine the driving factors behind GDP
- Build a model that maximally explains variation in GDP
- Guide policymakers in breaking down economic barriers

```
## Observations: 185
## Variables: 15
## $ Country          <chr> "Afghanistan", "Albania", "Algeria", "Angola", …
## $ Region           <chr> "Asia-Pacific", "Europe", "Middle East and Nort…
## $ GovInterference  <chr> "Repressive", "Moderate", "Extensive", "Extensi…
## $ TariffRate       <dbl> 7.0, 1.1, 8.8, 9.4, 7.5, 2.1, 1.2, 2.0, 5.2, 18…
## $ IncomeTaxRate    <dbl> 20.0, 23.0, 35.0, 17.0, 35.0, 26.0, 45.0, 50.0,…
## $ CorporateTaxRate <dbl> 20.0, 15.0, 23.0, 30.0, 30.0, 20.0, 30.0, 25.0,…
## $ TaxBurden        <dbl> 5.0, 24.9, 24.5, 20.6, 30.8, 21.3, 28.2, 42.7, …
## $ GovSpending      <dbl> 25.6, 29.5, 41.4, 25.3, 41.0, 26.4, 36.5, 50.2,…
## $ Population       <dbl> 35.5, 2.9, 41.5, 28.2, 44.1, 3.0, 24.8, 8.8, 9.…
## $ GDP              <dbl> 69.6, 36.0, 632.9, 190.3, 920.2, 28.3, 1246.5, …
## $ GDPGrowth        <dbl> 2.5, 3.9, 2.0, 0.7, 2.9, 7.5, 2.3, 2.9, 0.1, 1.…
## $ GDPperCap        <dbl> 1958, 12507, 15237, 6753, 20876, 9456, 50334, 4…
## $ Unemployment     <dbl> 8.8, 13.9, 10.0, 8.2, 8.7, 18.2, 5.6, 5.5, 5.0,…
## $ Inflation        <dbl> 5.0, 2.0, 5.6, 31.7, 25.7, 0.9, 2.0, 2.2, 13.0,…
## $ PublicDebt       <dbl> 7.3, 71.2, 25.8, 65.3, 52.6, 53.5, 41.6, 78.8, …
```

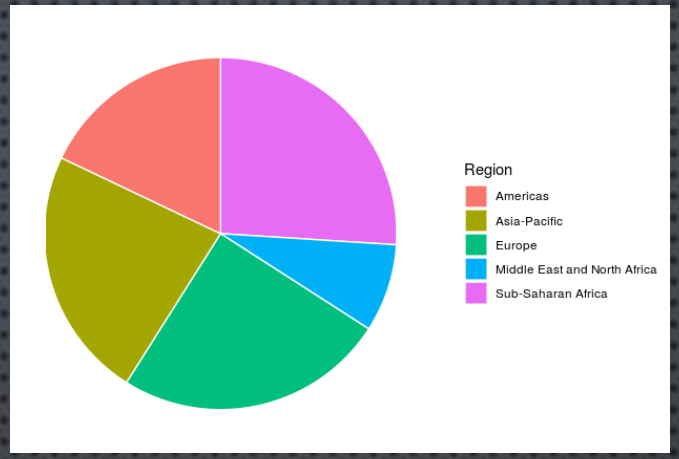


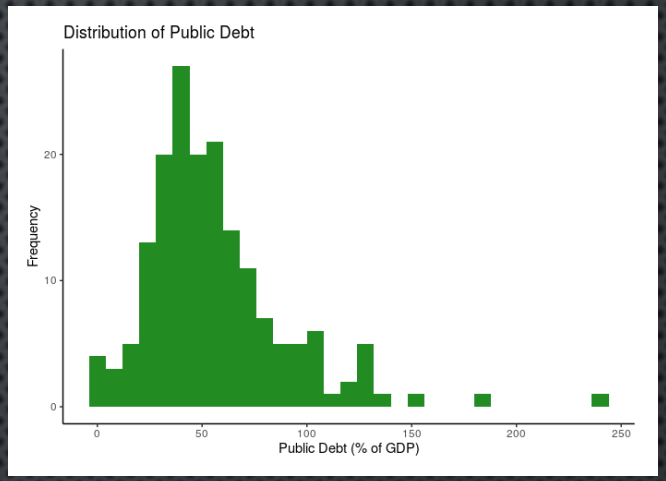


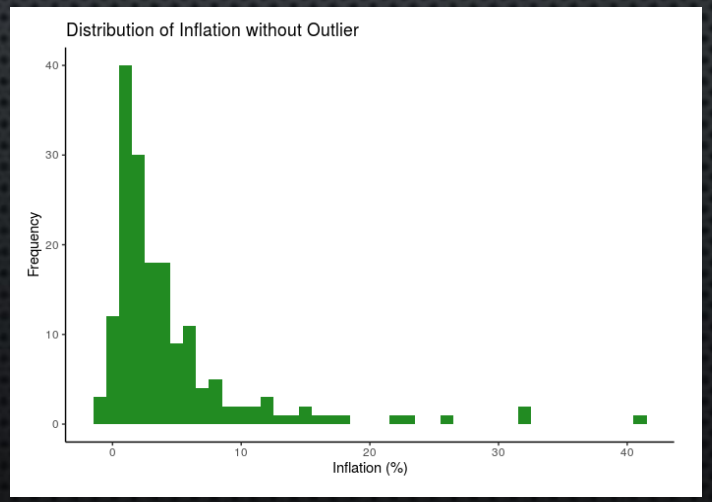
UNIVARIATE ANALYSIS: GDP

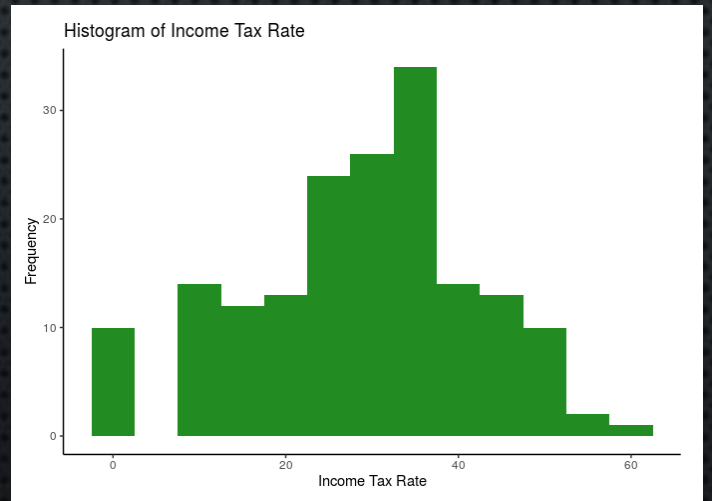
UNIVARIATE ANALYSIS

REGION	PUBLIC DEBT
INFLATION RATE	INCOME TAX



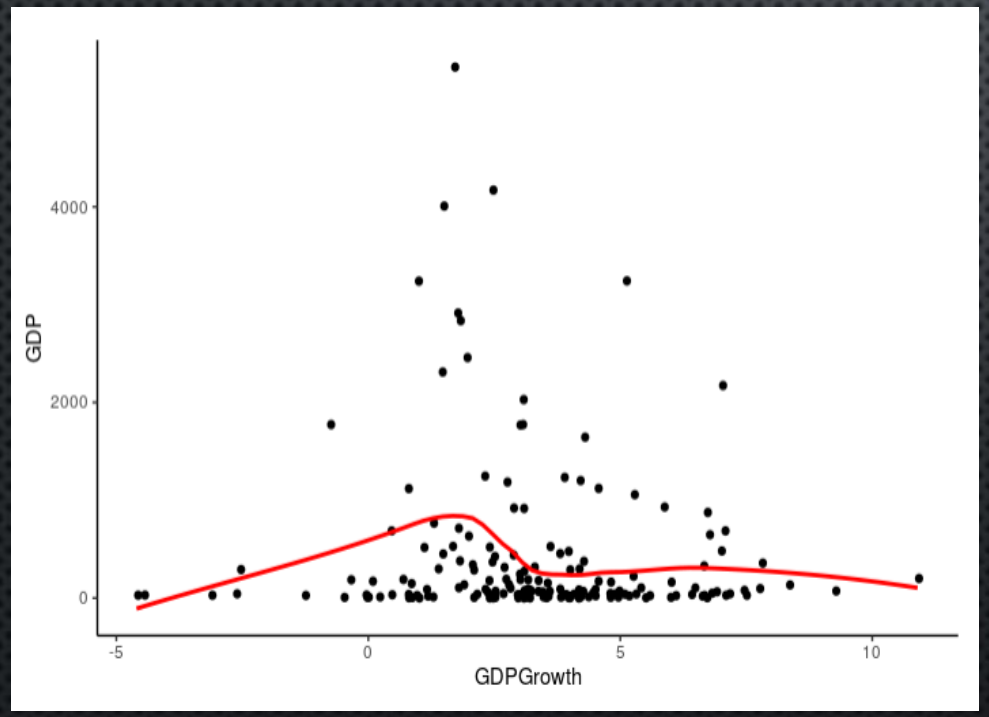




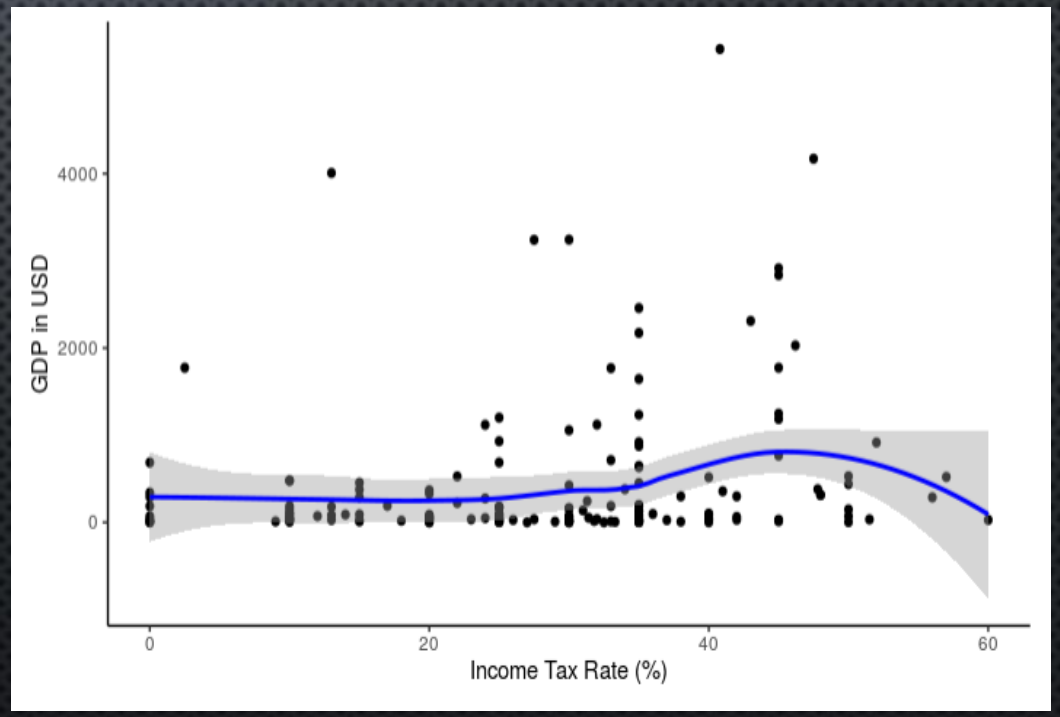


INTERESTING RELATIONSHIPS

GDP & GDP Growth are inversely related



Income Tax & GDP are share an oddly weak relationship



Model Creation

Selection Order: Forward, Backward

- Same model for each selection Order

Selection Criteria: AIC, BIC, adj R2

- All selected: **TariffRate + logpop + GDPGrowth + GovInterference**

- Partially selected predictors variables & Interactions were evaluated with **nested-F tests**

Possible Variables

TariffRate

Logpop

TaxBurden

GDP Growth

Inflation

GovInterference

Region

CorporateTaxRate

IncomeTaxRate

GovSpending

Unemployment

PublicDebt

Final Model

TariffRate: -.009

Logpop: 1.006

TaxBurden: -.02

GDPGrowth: -.057

Inflation (Categorical)

GovInterference (Categorical)

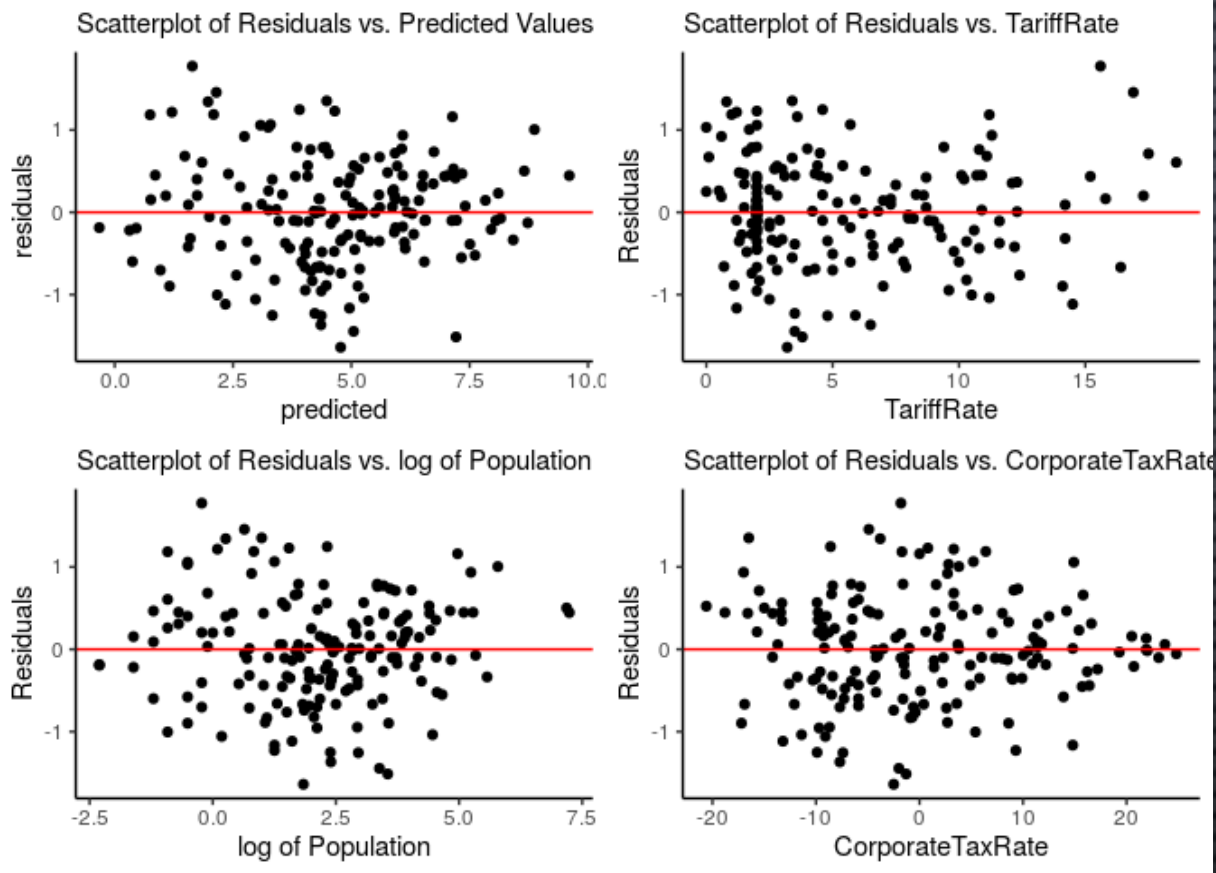
Region (Categorical)

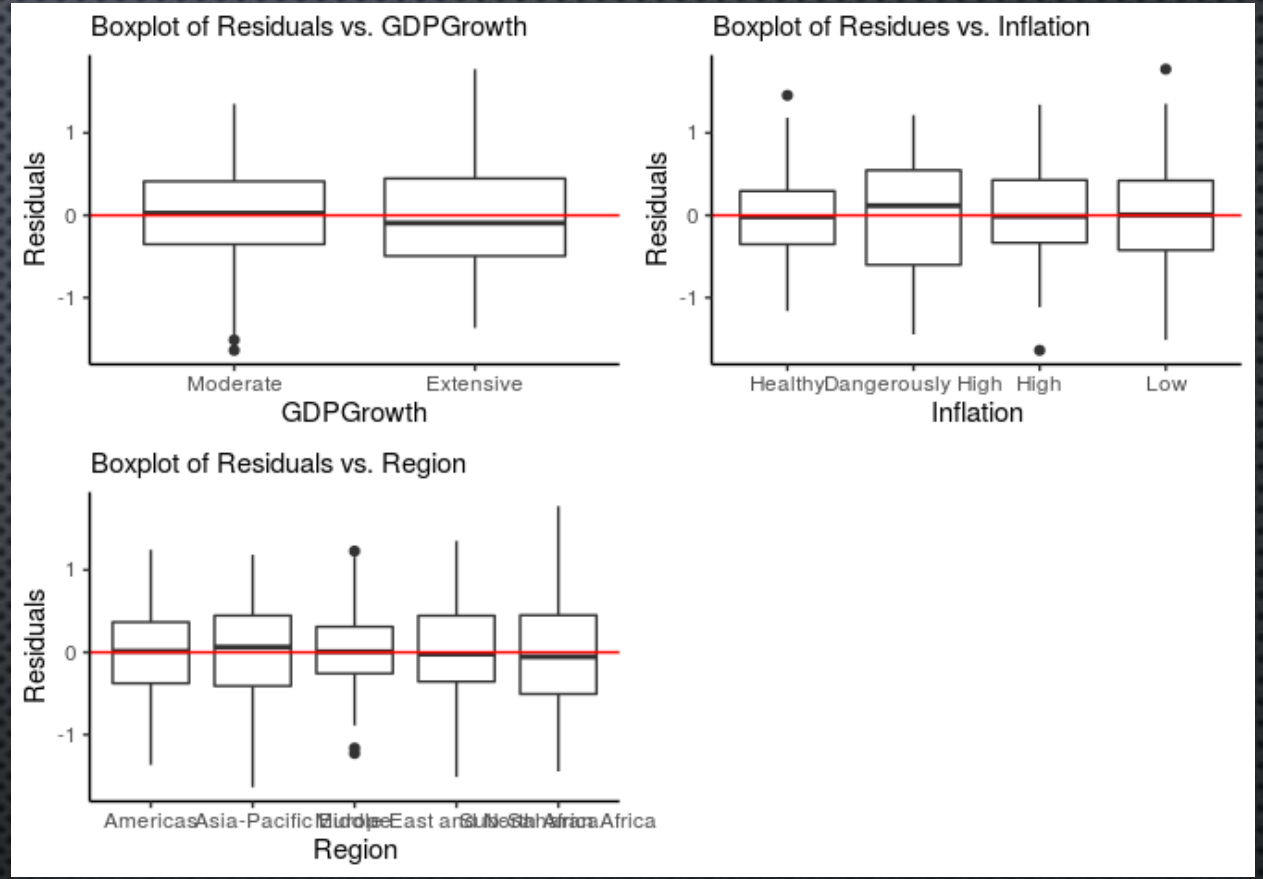
Intercept: 3.117

Interaction: TariffRate X Region

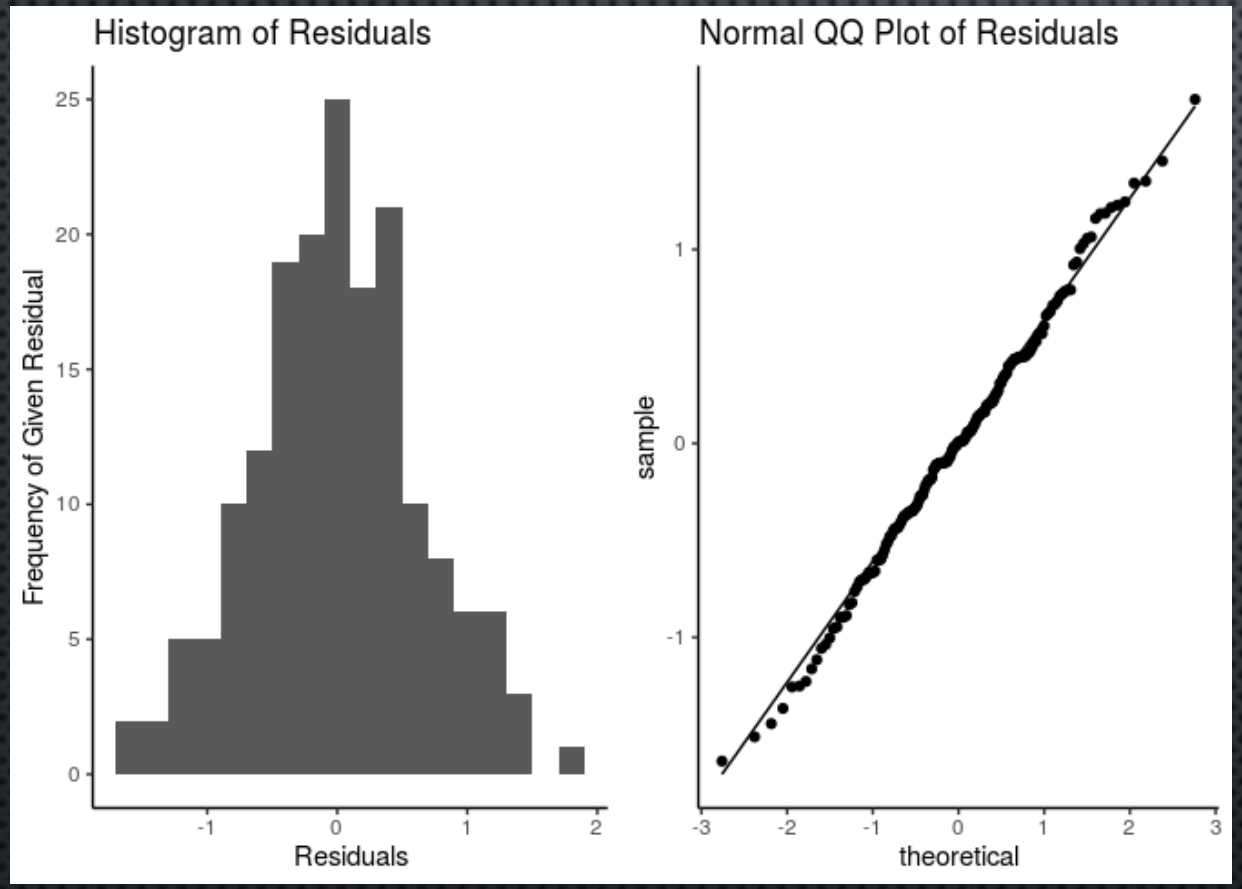
Interaction: TariffRate X GovInterference

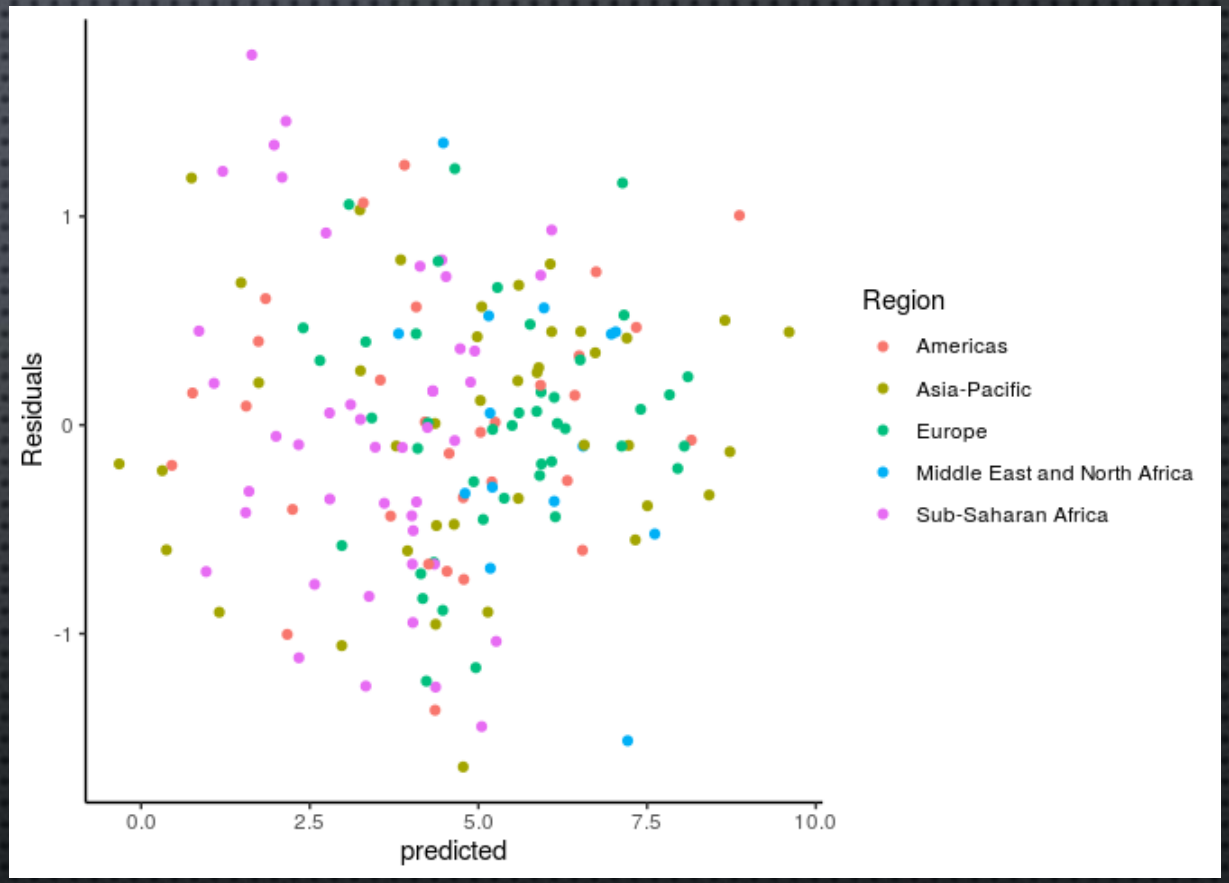
Final R^2 : 84.2%





CONSTANT VARIANCE + LINEARITY

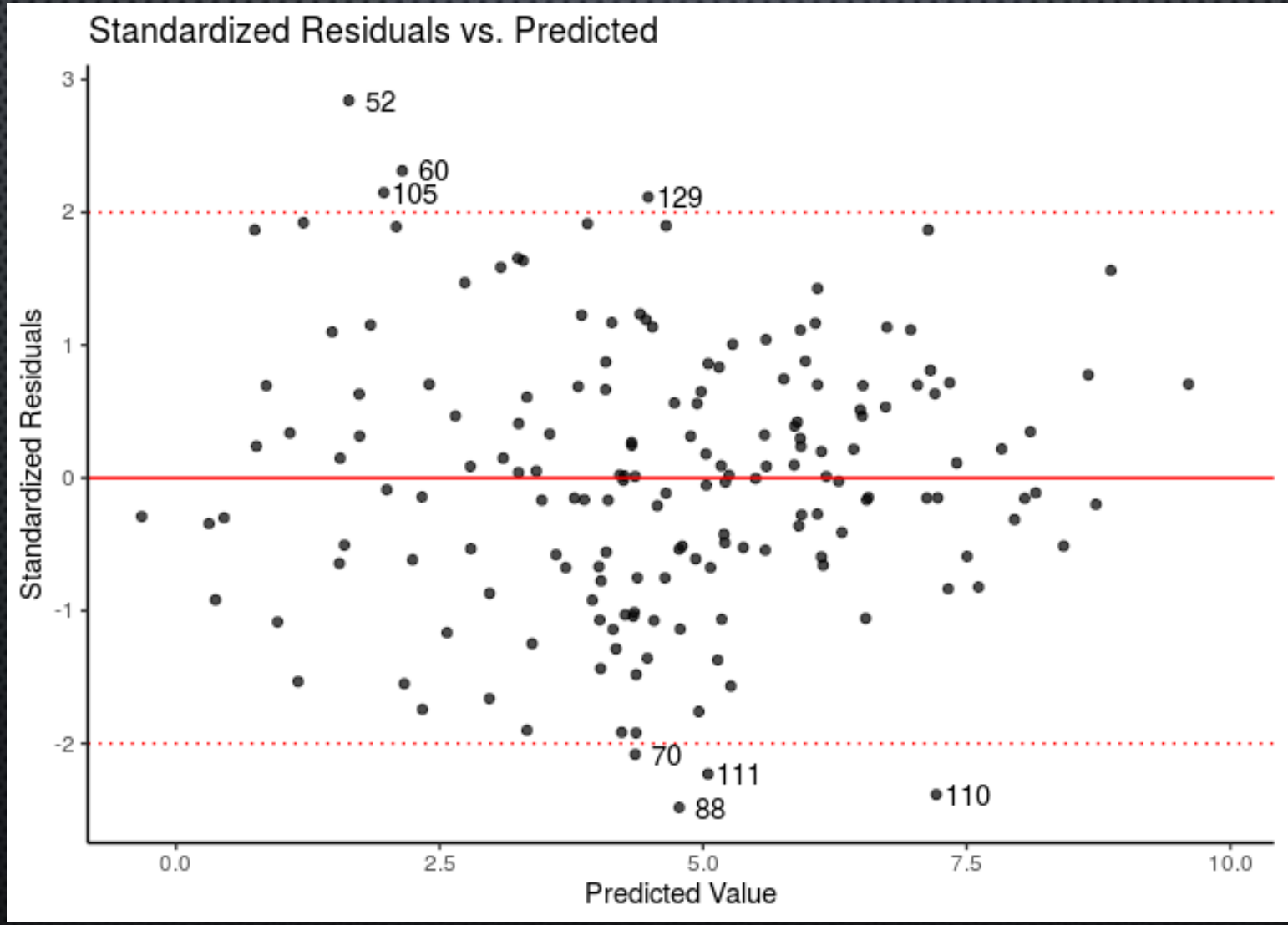




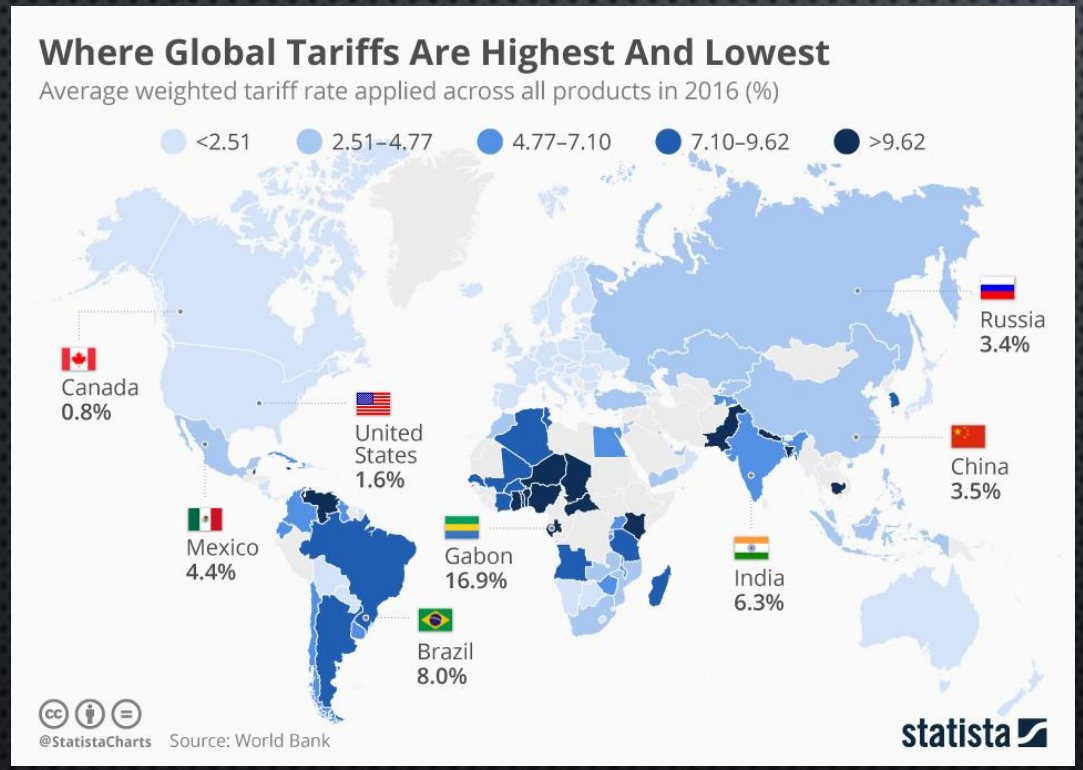
NORMALITY

INDEPENDENCE

MODEL DIAGNOSTICS



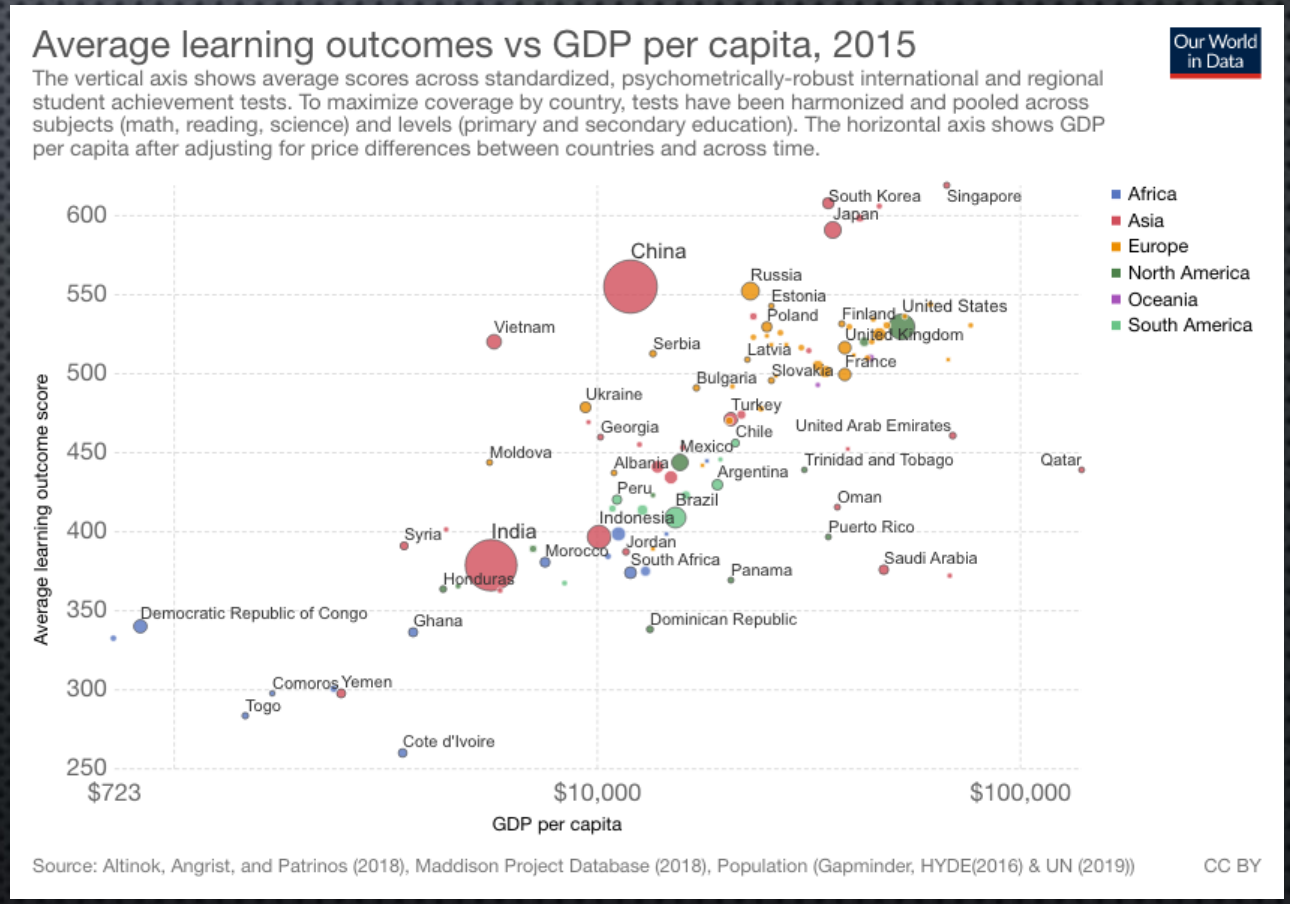
SURPRISING FINDINGS & INTERPRETATIONS



- **TariffRate X Region**
  - Countries in the Americas have the highest estimate in this interaction
  - Suggests that Americas suffer less repercussions for tariffs
- **Population**
  - Dominant term for most countries
  - Suggests that population growth may be efficient way to make further growth
- **Inflation Interactions**
  - None proved significant
  - Currency stability?

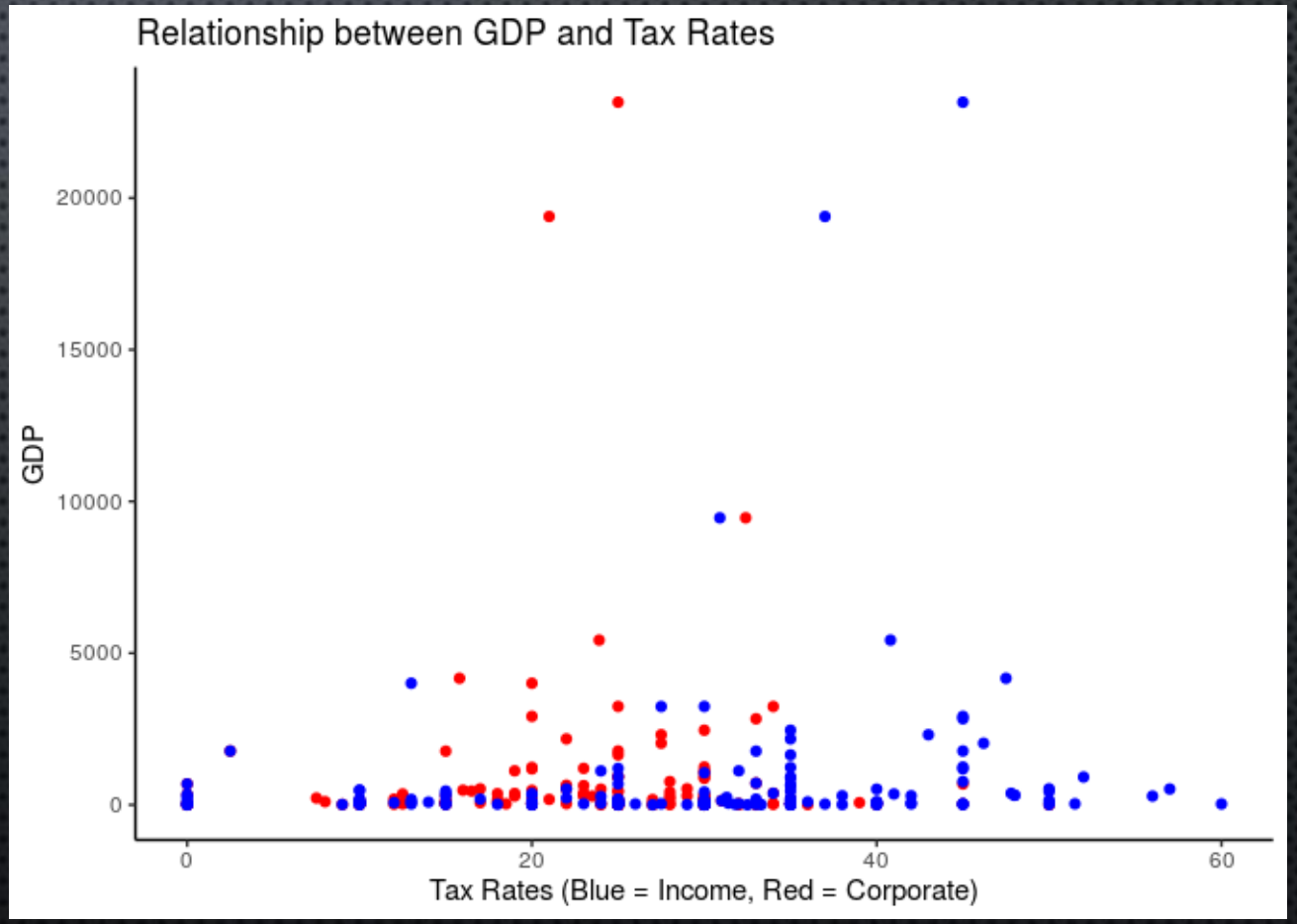
CHALLENGES & ISSUES

- **OMITTED COUNTRIES**
  - 12 TOTAL
  - INCLUDES SOMALIA, IRAQ, NORTH KOREA, ETC
  - MOSTLY DEVELOPING COUNTRIES
  - POOR DATA COLLECTION
- **INDEPENDENCE**
  - ECONOMIC STATS ARE VERY COMPLEX
  - MANY INDICATORS ARE OFTEN RELATED TO EACH OTHER, LEADING TO POTENTIAL MULTICOLLINEARITY
    - FUTURE PROJECT: ADD NON-ECONOMIC INDICATORS!



THE BIG PICTURE

- **MUCH OF A COUNTRY'S GDP IS OUT OF THE GOVERNMENT'S CONTROL**
  - REGION FOUND TO BE A SIGNIFICANT PREDICTOR AND INTERACTS WITH OTHER PREDICTORS
- **IMPROVING GDP IS AN INTERNATIONAL EFFORT, NOT A SOLO ONE**
  - TARIFF RATES WERE SIGNIFICANT AND INTERACTED WITH OTHER VARIABLES
- **SHORT TERM SOLUTIONS TRADE OFF WITH LONG-TERM IMPROVEMENTS**
  - TAX RATES, PUBLIC DEBT NOT FOUND TO BE SIGNIFICANT
  - EXTREME MEASURES USUALLY FAIL



END

CREDITS & REFERENCES

Constantin ANGHELACHE & Vergil VOINEAGU & Diana Valentina SOARE & Daniel DUMITRESCU, 2013. "The Economy of Romania during the Period 2000-2012," Romanian Statistical Review Supplement, Romanian Statistical Review, vol. 61(1), pages 96-104, March.

"Country Rankings." *Country Rankings: World & Global Economy Rankings on Economic Freedom*, Heritage Foundation, 2019, https://www.heritage.org/index/ranking.

J D Urrutia *et al.* 2017. *J. Phys.: Conf. Ser.* **820** 012008