

Economic Freedom index

Analysis of the variables inside the index

- Original dataframe:
 - 1970 - 2021
 - 165 countries
 - +40 variables
 - +80 columns

- How this variables affects to the final index and the measure of it
- Which one is easier to influence? Which one is harder?
- General insight knowledge if this dataframe, useful in business field?

1. Size of Government

- A. Government consumption
- B. Transfers and subsidies
- C. Government enterprises and investment
- D. Top marginal tax rate
 - (i) Top marginal income tax rate
 - (ii) Top marginal income and payroll tax rate
- E. State ownership of assets

4. Freedom to Trade Internationally

- A. Tariffs
 - (i) Revenue from trade taxes (% of trade sector)
 - (ii) Mean tariff rate
 - (iii) Standard deviation of tariff rates
- B. Regulatory trade barriers
 - (i) Non-tariff trade barriers
 - (ii) Compliance costs of importing and exporting
- C. Black-market exchange rates
- D. Controls of the movement of capital and people
 - (i) Foreign ownership / investment restrictions
 - (ii) Capital controls
 - (iii) Freedom of foreigners to visit

2. Legal System and Property Rights

- A. Judicial independence
- B. Impartial courts
- C. Protection of property rights
- D. Military interference in rule of law and politics
- E. Integrity of the legal system
- F. Legal enforcement of contracts
- G. Regulatory costs of the sale of real property
- H. Reliability of police
- I. Business costs of crime
- J. Gender Disparity Adjustment

3. Sound Money

- A. Money growth
- B. Standard deviation of inflation
- C. Inflation: most recent year
- D. Freedom to own foreign currency bank accounts

5. Regulation

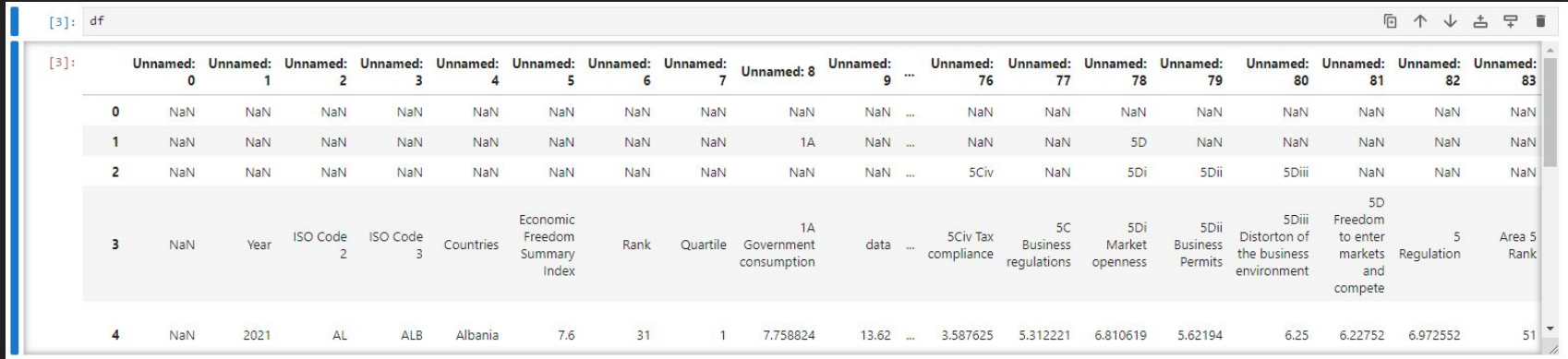
- A. Credit market regulations
 - (i) Ownership of banks
 - (ii) Private sector credit
 - (iii) Interest rate controls / negative real interest rates
- B. Labor market regulations
 - (i) Hiring regulations and minimum wage
 - (ii) Hiring and firing regulations
 - (iii) Centralized collective bargaining
 - (iv) Hours regulations
 - (v) Mandated cost of worker dismissal
 - (vi) Conscription
- C. Business regulations
 - (i) Administrative requirements
 - (ii) Bureaucracy costs
 - (iii) Starting a business
 - (iv) Extra payments / bribes / favoritism
 - (v) Licensing restrictions
 - (vi) Cost of tax compliance

Index variables

- 5 Big different groups
 - **Size of the government**: reliance in the government to allocate resources, goods and services
 - **Legal System and property rights**: grade of respect for protection of persons and their rightfully acquired property
 - **Sound money**: money as a wheel of exchange, fluctuation of rates of inflation and monetary policy
 - **Freedom to trade internationally**: freedom of exchange and the possibility to trade internationally
 - **Regulation**: entry barriers and regulatory restraints that limit the freedom of exchange

Cleaning process

Initial cleaning: rows entirely of NaN values, 86 columns without name and treatment of the NaN values in different rows



[3]: df

[3]:	Unnamed: 0	Unnamed: 1	Unnamed: 2	Unnamed: 3	Unnamed: 4	Unnamed: 5	Unnamed: 6	Unnamed: 7	Unnamed: 8	Unnamed: 9	...	Unnamed: 76	Unnamed: 77	Unnamed: 78	Unnamed: 79	Unnamed: 80	Unnamed: 81	Unnamed: 82	Unnamed: 83
0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	1A	NaN	...	NaN	NaN	5D	NaN	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	5Civ	NaN	5Di	5Dii	5Diii	NaN	NaN	NaN
3	NaN	Year	ISO Code 2	ISO Code 3	Countries	Economic Freedom Summary Index	Rank	Quartile	1A Government consumption	data	...	5Civ Tax compliance	5C Business regulations	5Di Market openness	5Dii Business Permits	5Diii Distortion of the business environment	5D Freedom to enter markets and compete	5 Regulation	Area 5 Rank
4	NaN	2021	AL	ALB	Albania	7.6	31	1	7.758824	13.62	...	3.587625	5.312221	6.810619	5.62194	6.25	6.22752	6.972552	51

Cleaning process

Not relevant for my study: years before of 2014 and countries with no data in some aspects in recent years.

Add some new features: new columns that output some index according to original columns

Use of graphs

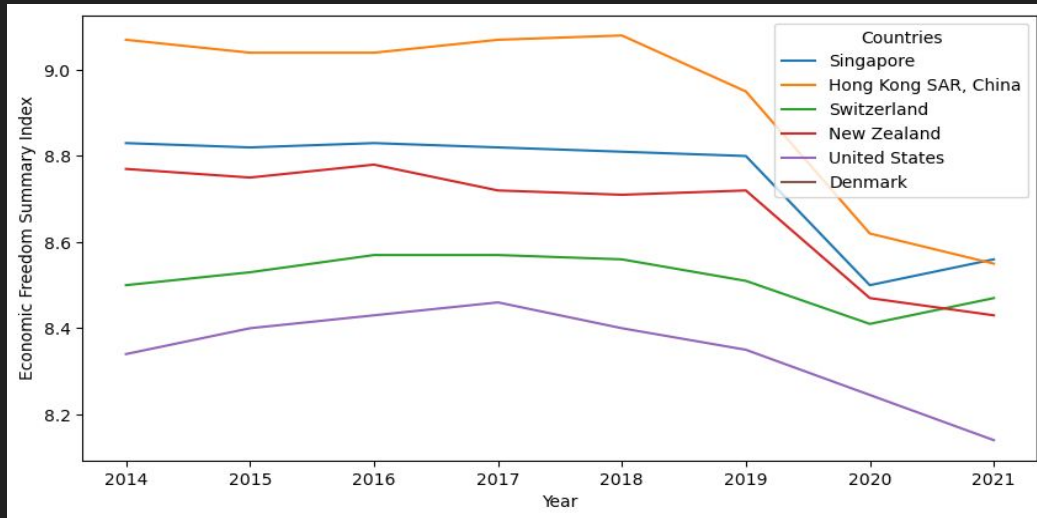
Create LinePlot to visualize the outputs after the cleaning

Challenges and obstacles in the process

- First look in a dataset is scary – Follow initial step to have a cleaner 1st step
- How should I show the insights? – Try the different graphs options and the size of them
- Why am I doing this? – Must have your plan always ready first

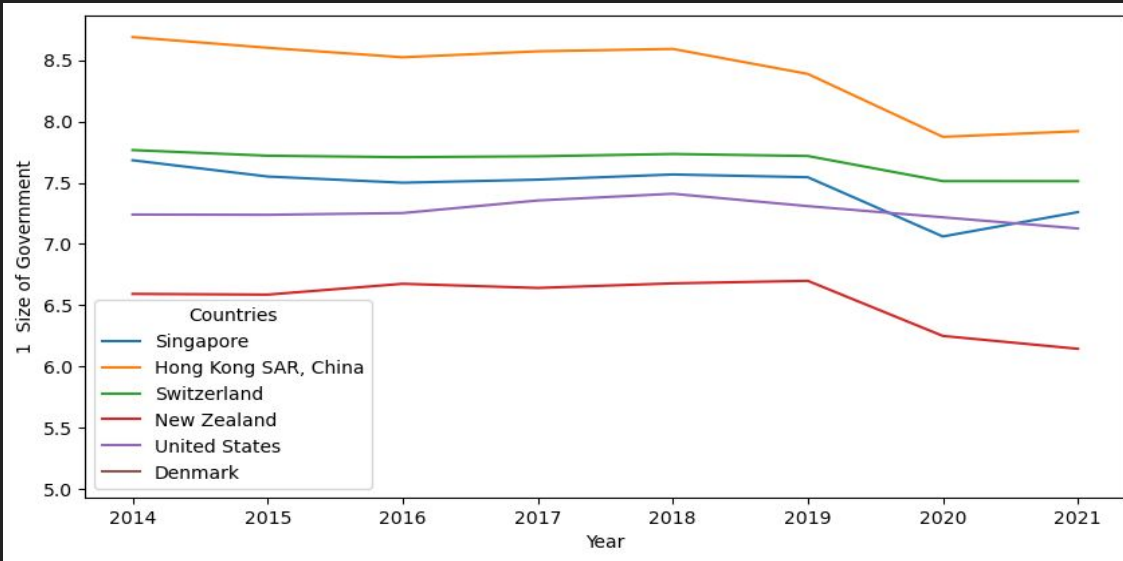
Outputs

Leaders in terms of this study:



Outputs

1 - Size of the government



1. Size of Government

- A. Government consumption
- B. Transfers and subsidies
- C. Government enterprises and investment
- D. Top marginal tax rate
 - (i) Top marginal income tax rate
 - (ii) Top marginal income and payroll tax rate
- E. State ownership of assets

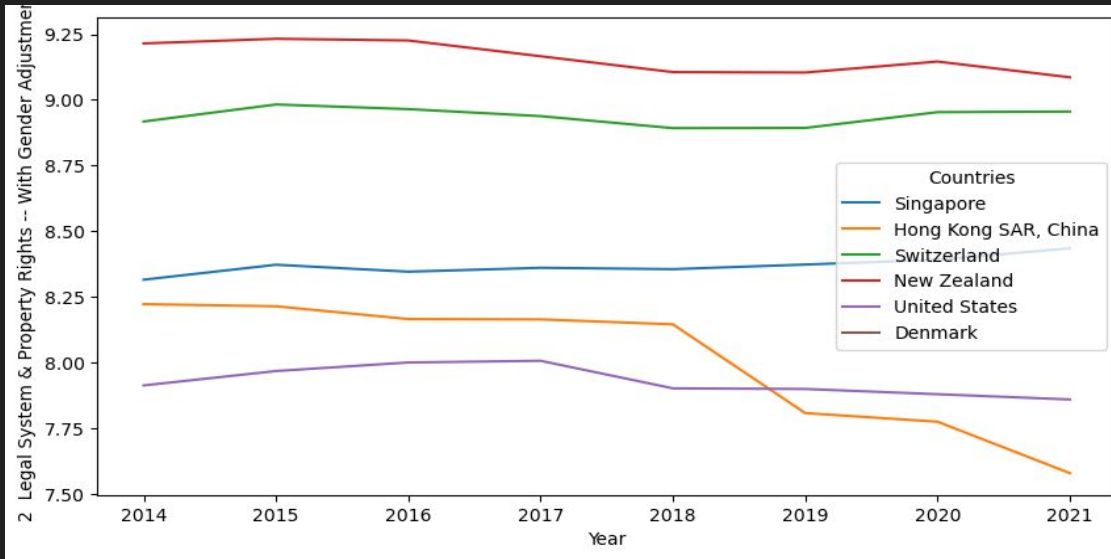
- Hong Kong leader due to a high GDP and a low tax rate
- Singapore, EEUU and Switzerland high marginal tax rate being Switzerland the lowers of this 3
- New Zealand not best index due to government replacing the personal consumption 3.75/10 even tho Singapore has the same value

Scoring

Year	Countries	1A Government consumption	1B Transfers and subsidies	1C Government investment	1D Top marginal tax rate	1E State ownership	1 Size of Government
2021	Singapore	3.776471	9.081744	9.445714	10	3.9975	7.260286
2021	Hong Kong SAR, China	7.0	8.814714	6.128571	10	7.655	7.919657
2021	Switzerland	6.014706	5.517711	10	7	9.03	7.512483
2021	New Zealand	3.752941	5.659401	7.92	6	7.3975	6.145968
2021	United States	6.641176	4.735695	9.857143	5	9.4	7.126803

Outputs

2 - Legal System and property rights



2. Legal System and Property Rights

- A. Judicial independence
- B. Impartial courts
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- D. Military interference in rule of law and politics
- E. Integrity of the legal system
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- United States are low because of crimes factor and the military interference
- Hong Kong has problems in terms of legal integrity as well as military interference
- New Zealand and Switzerland 2nd best score even with low score from contracts in switzerlands

Scoring

Year	Countries	2A Judicial independence	2B Impartial courts	2C Property rights	2D Military interference	2E Legal integrity	2F Contracts	2G Real property	2H Police and crime	2 Legal System & Property Rights -- With Gender Adjustment
2021	Singapore	6.593784	7.599036	9.472179	8.333333	8.370417	8.553674	8.961691	9.594053	8.434771
2021	Hong Kong SAR, China	7.162002	8.564236	9.356141	5.833333	6.487833	8.064573	6.949194	8.213938	7.578906
2021	Switzerland	8.610139	8.894739	9.520042	10	8.828417	6.666528	9.598999	9.524524	8.955423
2021	New Zealand	8.55454	8.829954	9.046323	10	8.698083	8.319234	9.900982	9.337665	9.085847
2021	United States	7.774753	7.675378	8.800113	6.666667	7.541833	7.838415	8.923825	7.654595	7.859447

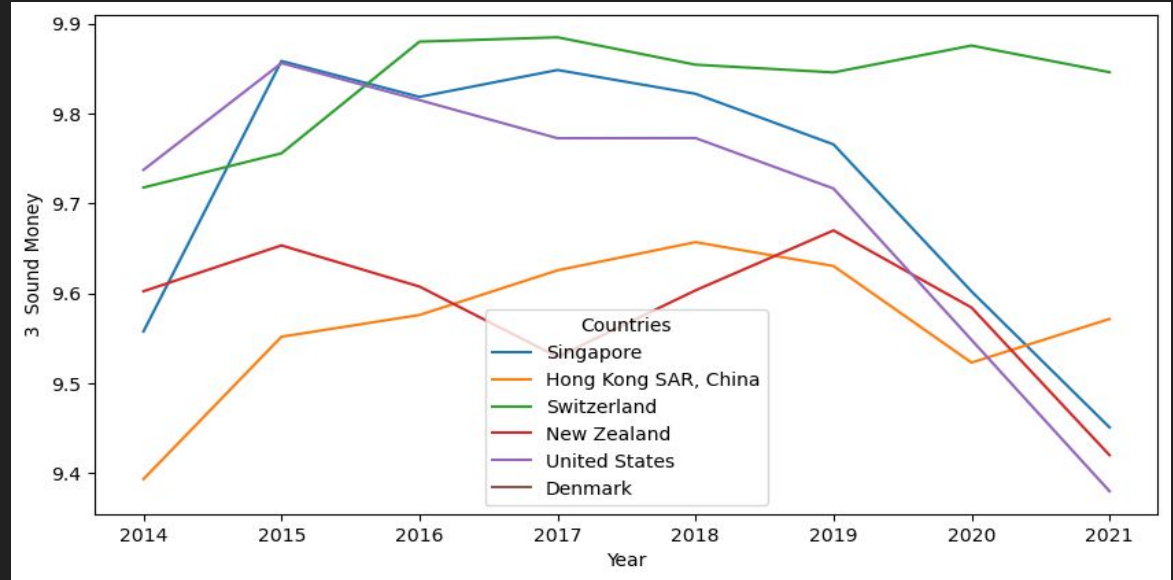
Outputs

3 - Sound money

- How capitalism are this countries
- How well they manage the inflation and interest rates
- Switzerland leader due to their money growth potential

3. Sound Money

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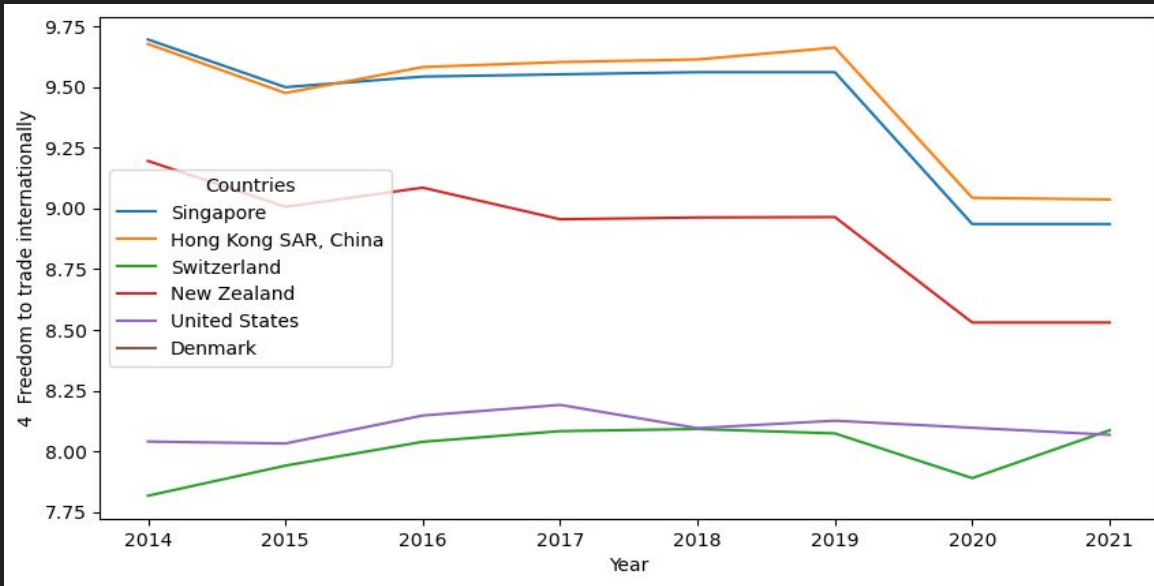


Scoring

Year	Countries	3A Money growth	3B Standard deviation of inflation	3C Inflation	3D Foreign currency bank accounts	3 Sound Money
2021	Singapore	9.28423	8.979882	9.539028	10	9.450785
2021	Hong Kong SAR, China	9.123188	9.476245	9.686248	10	9.57142
2021	Switzerland	9.752533	9.747567	9.883637	10	9.845934
2021	New Zealand	9.301647	9.166209	9.211776	10	9.419908
2021	United States	8.959365	9.499298	9.060428	10	9.379773

Outputs

4 - Freedom to trade internationally



4. Freedom to Trade Internationally

A. Tariffs

- (i) Revenue from trade taxes (% of trade sector)
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B. Regulatory trade barriers

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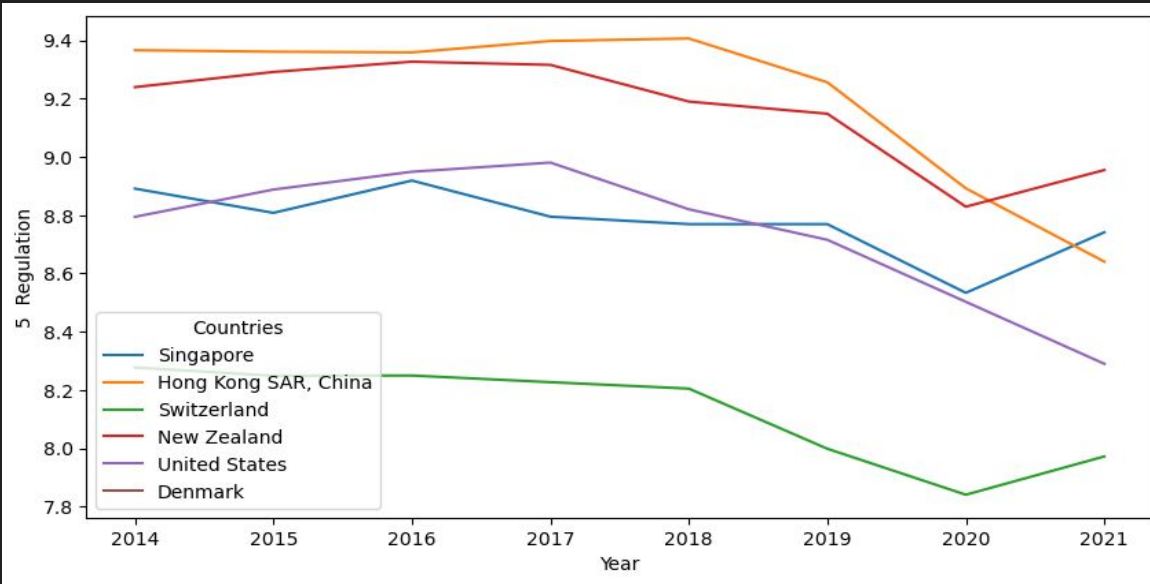
- Singapore and Hong Kong leaders due to the non-barriers and low tariffs to international trade
- Switzerland very low capital control 3/10 as well as EEUU 4/10
- Conflict with freedom to visit this countries and the SD of tariff

Scoring

Year	Countries	4Ai Trade tax revenue	4Aii Mean tariff rate	4Aiii Standard deviation of tariff rates	4A Tariffs	4Bi Non-tariff trade barriers	4Bii Costs of importing and exporting	4B Regulatory trade barriers	4C Black market exchange rates	4Di Financial openness	4Dii Capital controls	4Diii Freedom of foreigners to visit	4Div Protection of Foreign Assets	4D Controls of the movement of capital and people	4 Freedom to trade internationally
2021	Singapore	10	10	10	10	9.182021	9.204736	9.193378	10	10	6.923077	0	9.265505	6.547145	8.935131
2021	Hong Kong SAR, China	10	10	10	10	9.157931	9.669882	9.413907	10	10	7.692308	0	9.231481	6.730947	9.036213
2021	Switzerland	9.9	8.88	0	6.26	6.862342	9.908284	8.385313	10	10	3.076923	8.850051	8.875913	7.700722	8.086509
2021	New Zealand	8.553333	9.62	8.9588	9.044044	8.722516	8.739651	8.731084	10	10	6.923077	0	8.454909	6.344496	8.529906
2021	United States	8.980392	9.32	6.4776	8.259331	7.007965	9.801184	8.404574	10	10	3.846154	0	8.584241	5.607599	8.067876

Outputs

5 - Regulations



- Data on the use and duration of military conscription gives Switzerland and Singapore 0/10
- Facility to create a business in Switzerland has the lower score 7.7/10 and Hong Kong the highest 9.5/10
- Hong Kong was the leader thanks to his labour policies (hiring and firing regulation, flexible wage...)

Scoring

Year	Countries	5Bii Hiring and firing regulations	5Biii Flexible wage determination	5Biv Hours Regulations	5Bvi Conscription	5Bvii Foreign Labor	5B Labor market regulations	5Ci Regulatory Burden	5Cii Bureacracy costs	5Ciii Impartial Public Administration	5Civ Tax compliance	5C Business regulations	5Di Market openness	5Dii Business Permits	5Diii Distorton of the business environment	Freedom to enter markets and compete	5 Regulation
2021	Singapore	8.75	8.388528	10	0	5.673136	7.365952	7.439485	9.555556	9.6175	9.641302	9.06346	8.111943	9.994028	7.5	8.535324	8.741184
2021	Hong Kong SAR, China	9.749616	8.634663	10	10	6.833094	9.066658	7.314653	6.222222	4.8275	9.806639	7.042754	9.713884	9.793808	9.454406	9.654033	8.640493
2021	Switzerland	8.75	7.899826	6	0	5.368371	6.681171	6.324563	7.333333	9.78	8.396906	7.958701	8.018756	8.373754	7.5	7.96417	7.97203
2021	New Zealand	8.75	7.624967	10	10	6.87834	8.779044	5.191193	8.444444	9.115	9.215347	7.991496	9.995473	9.39883	9.727203	9.707169	8.954889
2021	United States	10	7.789197	10	10	6.720049	9.137035	5.773777	6.444444	8.2875	6.519184	6.756226	9.963757	9.60384	10	9.855866	8.289949

Conclusions

1. The most difficult variable to success in is the **size of the government** due to the tendency to rely more on them
2. The easiest one is **Sound money** because of the low variety of variables and the fact that they are so linked
3. The extreme influence of some variables such as the mandatory military service, labour force regulation and others in terms of freedom
4. The importance of the GDP has a very important factor inside of the freedom rating
5. Importance to analyze this dataset before open a business could be crucial because give you the knowledge to compare business in the business related variables



Thanks for your time!!

Ivan Jimenez