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# Offshore Activity in High Income non OECD countries

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Suggested Presentation:

Shashi: 2-5: Understanding (4 slides)

Nana: 6-13: Data Cleaning (8 slides)

Shashi: 14-22: Pre-processing + Intro (9 slides)

Nana: 23-31: Transparency Index Analysis (9 slides)

Helio: 32-41: Clustering Analysis (10 slides)

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# Offshore Understanding

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- Financial offshore activity usually motivated by:
    - privacy
    - evade tax
    - easily access deposits
    - protection of financial assets
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# Offshore Understanding

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- Structure of privacy and anonymity offers financial platform for illegal activities.

“They support a system that, critics charge, caters to **drug traffickers, fraudsters, money launderers** and high-net-worth **tax dodgers**, fueling onshore corruption and poverty. ”

(<http://www.icij.org/offshore/sun-and-shadows-how-island-paradise-became-haven-dirty-money>)

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# Offshore Understanding

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- Firms are specialized in helping to set up hard-to-trace “shell companies” for clients around the world.
  - These firms don't want to know where the money comes from nor what is the offshore purpose.
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# Offshore Understanding

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- Firms create a labyrinth of ownership structure, putting a company inside a company, inside a company, inside a company, ...
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# Data Source

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- ICIJ database fed for nearly 30 years by two companies offering such services.
  - It includes:
    - Setting up offshore companies
    - Setting up offshore trusts
    - Opening hard to trace bank accounts
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# Terminology

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- Entity: a company, trust, or fund.
  - Officer: a person or company who plays a role in an offshore entity
  - Master Client: an intermediary who helps an officer set up offshore entity.
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# ICIJ Database

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Data organized in three files:

- Nodes.csv: all nodes of database
  - Edges.csv: describe relationship between nodes
  - Countries.csv: country information of nodes
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# Data Cleaning - Nodes

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- Nodes removed:
    - Address nodes
    - Nodes with no country
    - Nodes with indecipherable description: 2, A, F, Hñingsv Hñgen 4A, P.O. Box 639 St, etc.
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# Data Cleaning - Nodes

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## Nodes Cleaning Summary

Initial Number of Nodes	Final Number of Nodes
279,495	170,066

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# Data Cleaning - Nodes

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## Final Category of Nodes

Node Types	Count
Officer	66,599
Entity	94,336
Master Client	7,994
Officer and Master Client	1,137

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# Data Cleaning - Edges

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- Edges table was completely discarded.
- Connection between nodes are hard to trace and often meaningless.

“Firms create a labyrinth of ownership structure, putting a company inside a company, inside a company, inside a company, ...”

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# Data Cleaning

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- Our goal is to analyze localization patterns of offshore entities and offshore owners, not their relationship.
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# Data Pre-processing

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- Total nodes in Officers category: 66,599
  - Not all Officers are people
  - How to select only people?
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# Data Pre-processing

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- Select Officers not containing words like:
    - Fund, Investment, International, LLC, LLP, Company, Limited, Corporation, S. A., etc.
  - Total of 32 filters applied.
  - From initial 66,599 Officers, approximately 55,490 can be considered to be people.
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# Data Analysis

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- World Bank categorizes countries by income groups.

<http://data.worldbank.org>

Income Group Countries	Number of Countries
High income: nonOECD	44
Upper middle income	55
High income: OECD	31
Lower middle income	50
Low income	34



# Data Analysis - People

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Offshore Activity by Income Group Countries	
Income Group Countries	People Involved
High income: nonOECD	20,183
Upper middle income	11,519
High income: OECD	7,148
Lower middle income	3,939
Low income	122

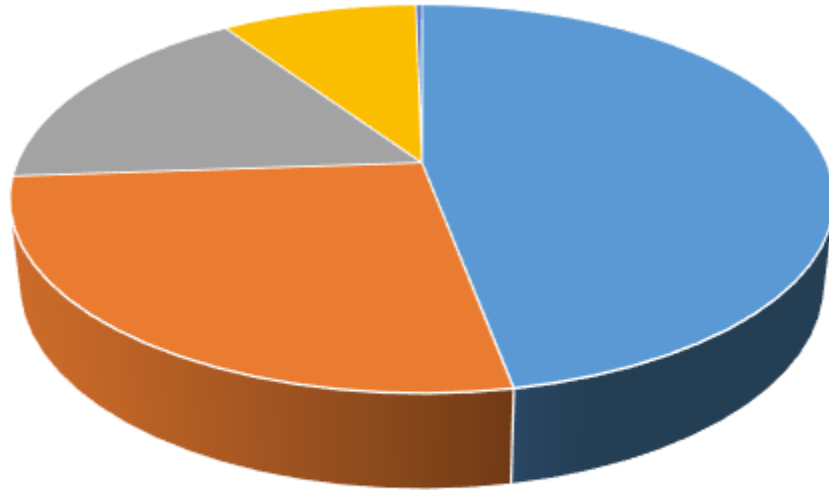
categorization from World Bank (<http://data.worldbank.org>)

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# Data Analysis - People

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People in Offshore Activity



- High income: nonOECD
- Upper middle income
- High income: OECD
- Lower middle income
- Low income

- High Income non OECD countries have significantly more people involved in offshore activity.

# Data Analysis - Entities

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Offshore Entities Hosts by Income Group Countries	
Income Group Countries	Entities Hosted
High income: nonOECD	45,652
Upper middle income	17,027
High income: OECD	9,811
Lower middle income	6,594
Low income	50

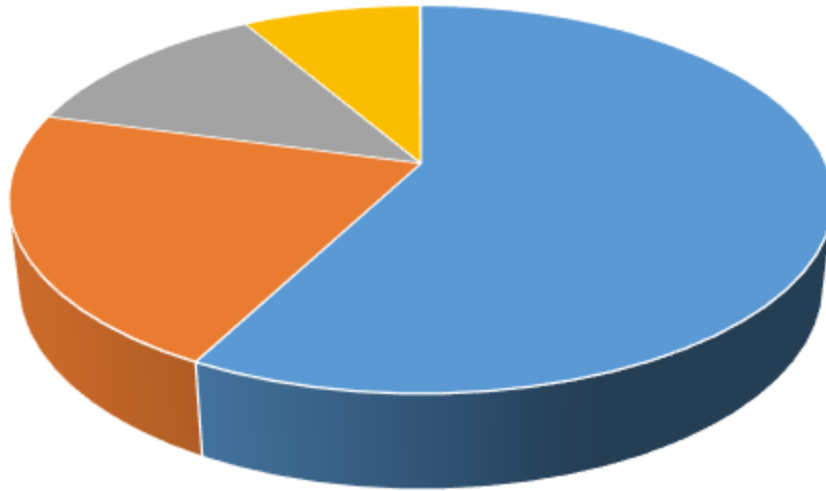
categorization from World Bank (<http://data.worldbank.org>)

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# Data Analysis - Entities

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Offshore Entities



- High income: nonOECD
- Upper middle income
- High income: OECD
- Lower middle income
- Low income

- High Income non OECD countries also host significantly more offshore entities.

# Data Analysis - Focus

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- Distinguished relevance of High Income non OECD (HINO) countries in global offshore scene.
  - Decision to focus our analysis on HINO countries.
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# Data Analysis - HINO Countries

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No information is present in ICIJ database for countries in red.

HINO Countries			
Aruba	Cayman Islands	Liechtenstein	French Polynesia
Andorra	Cyprus	Lithuania	Qatar
United Arab Emirates	Faeroe Islands	Latvia	Russian Federation
Antigua and Barbuda	Equatorial Guinea	Macao SAR, China	Saudi Arabia
Bahrain	Greenland	St. Martin (French part)	Singapore
Bahamas, The	Guam	Monaco	San Marino
Bermuda	Hong Kong SAR, China	Malta	Sint Maarten (Dutch part)
Barbados	Croatia	Northern Mariana Islands	Turks and Caicos Islands
Brunei Darussalam	Isle of Man	New Caledonia	Trinidad and Tobago
Channel Islands	St. Kitts and Nevis	Oman	Uruguay
Curaçao	Kuwait	Puerto Rico	Virgin Islands (U.S.)

# Transparency Index

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- The transparency index ranks countries based on how corrupt their public sector is perceived to be. ([www.transparency.org](http://www.transparency.org))
  - Country transparency index varies from 0 (highly corrupt) to 10 (very clean).
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# Transparency Index

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- 2010 transparency index has 170 countries
- Only 17 are HINO countries
- Important countries that doesn't have index:

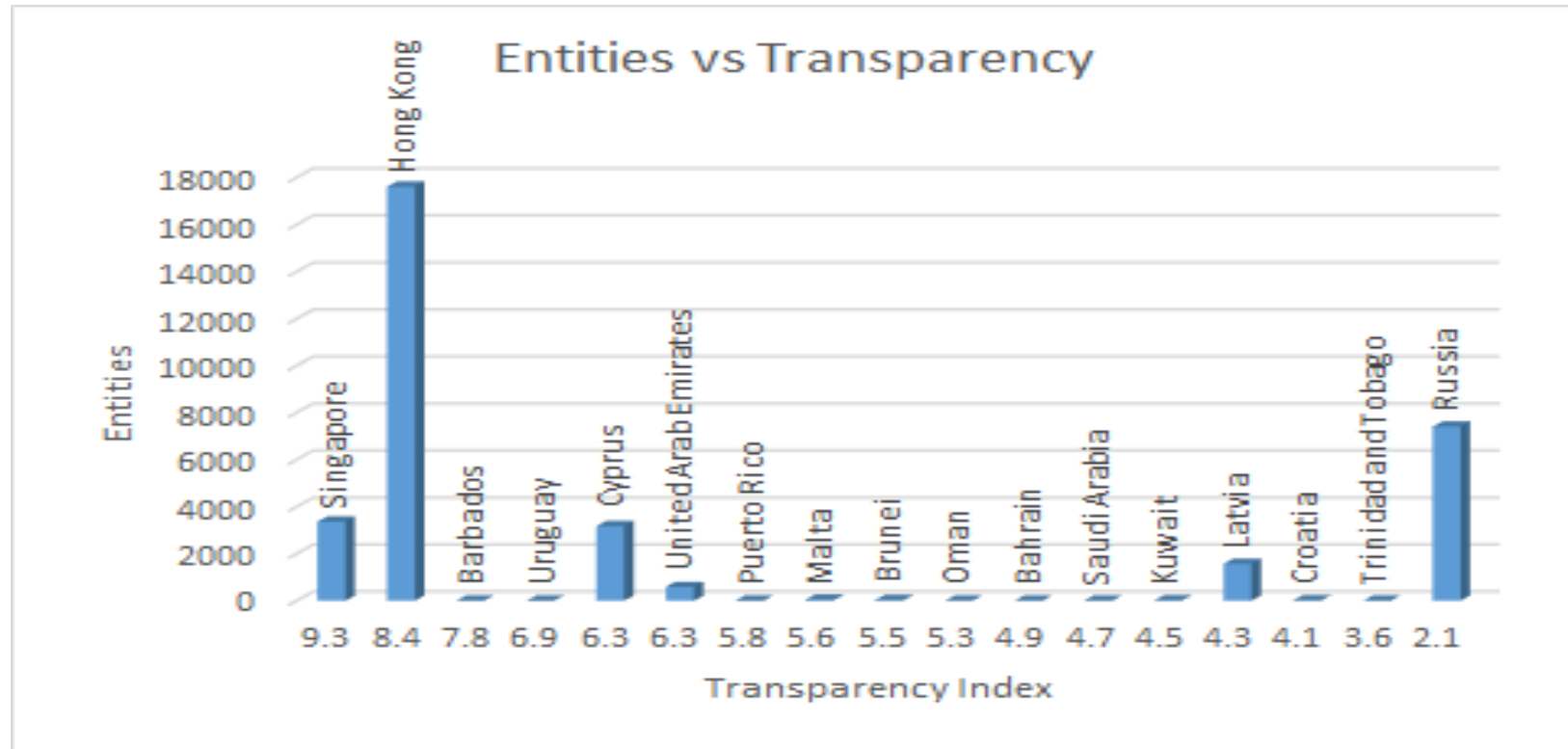
Country	# Entities Hosting	# People Involved
Cayman Islands	2,814	73
U.S. Virgin Islands	584	21
Antigua and Barbuda	268	11
Saint Kitts and Nevis	263	41



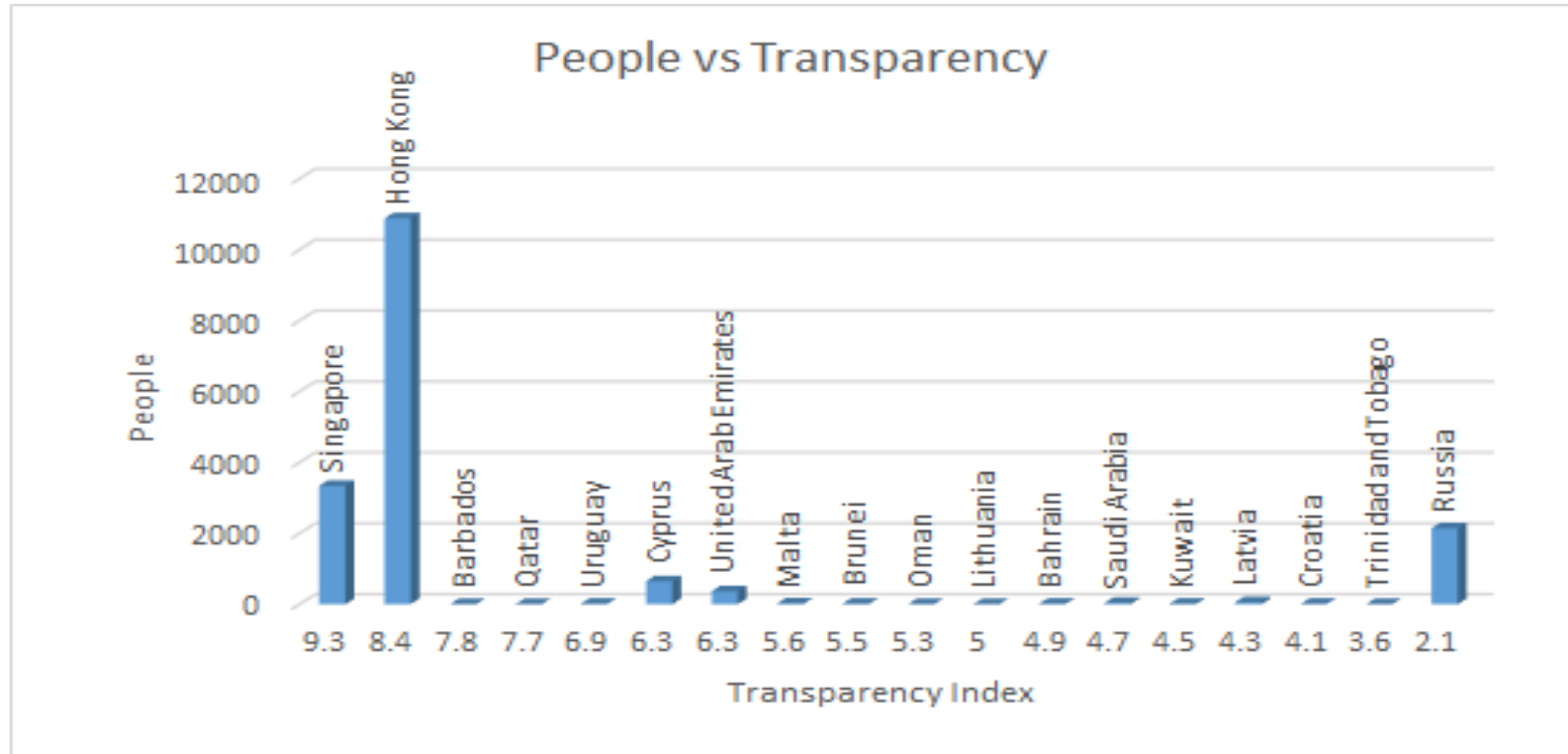
# HINO Countries Transparency Rank

Country	Entities	Index	Rank				
Singapore	3,366	9.3	1	Brunei	29	5.5	38
Hong Kong	17,620	8.4	13	Oman	1	5.3	41
Barbados	9	7.8	17	Bahrain	4	4.9	48
Uruguay	2	6.9	24	Saudi Arabia	3	4.7	50
Cyprus	3,174	6.3	28	Kuwait	14	4.5	54
Unit. A. Emirates	586	6.3	28	Latvia	1,571	4.3	59
Puerto Rico	3	5.8	33	Croatia	18	4.1	62
Malta	47	5.6	37	Trinidad & Tobago	1	3.6	73
				Russia	7,407	2.1	154

# HINO Countries Transparency Rank



# HINO Countries Transparency Rank



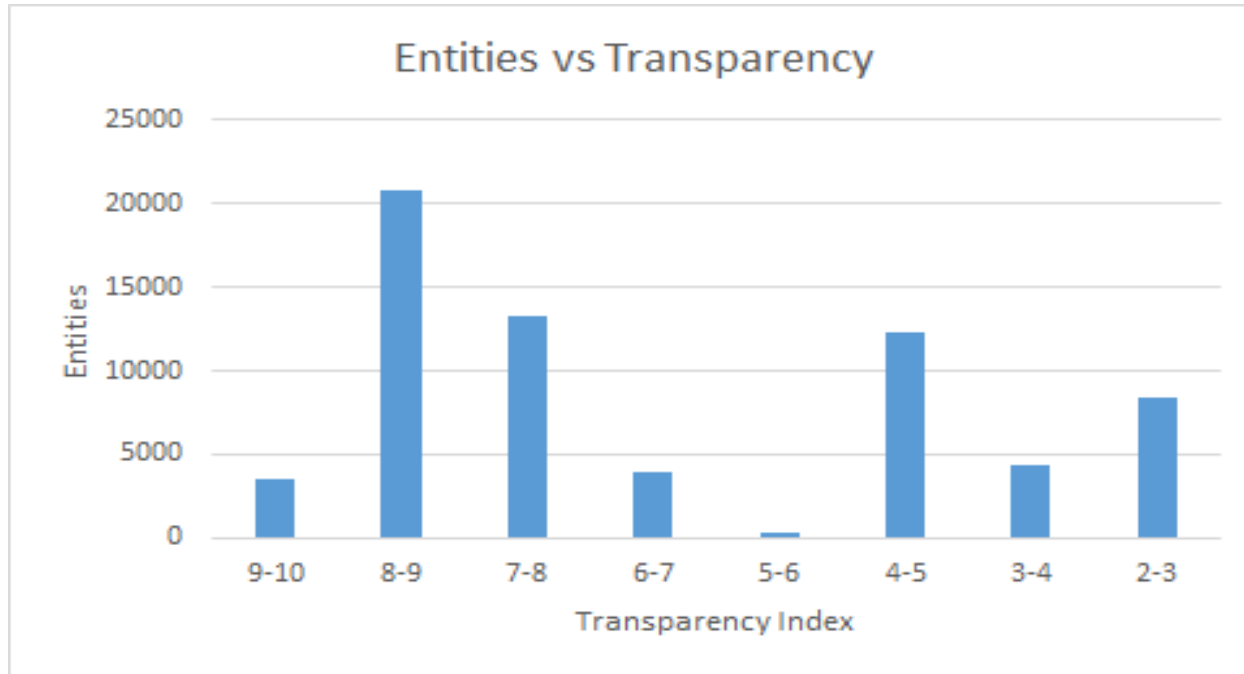
# HINO Countries Transparency Rank

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- The least corrupt (Singapore) and one of the most corrupt (Russia) countries are significant in both hosting offshore entities and seeking offshore services in HINO countries.
  - Are extremes of corruption level related to offshore activity?
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# Entities vs Transparency - Global

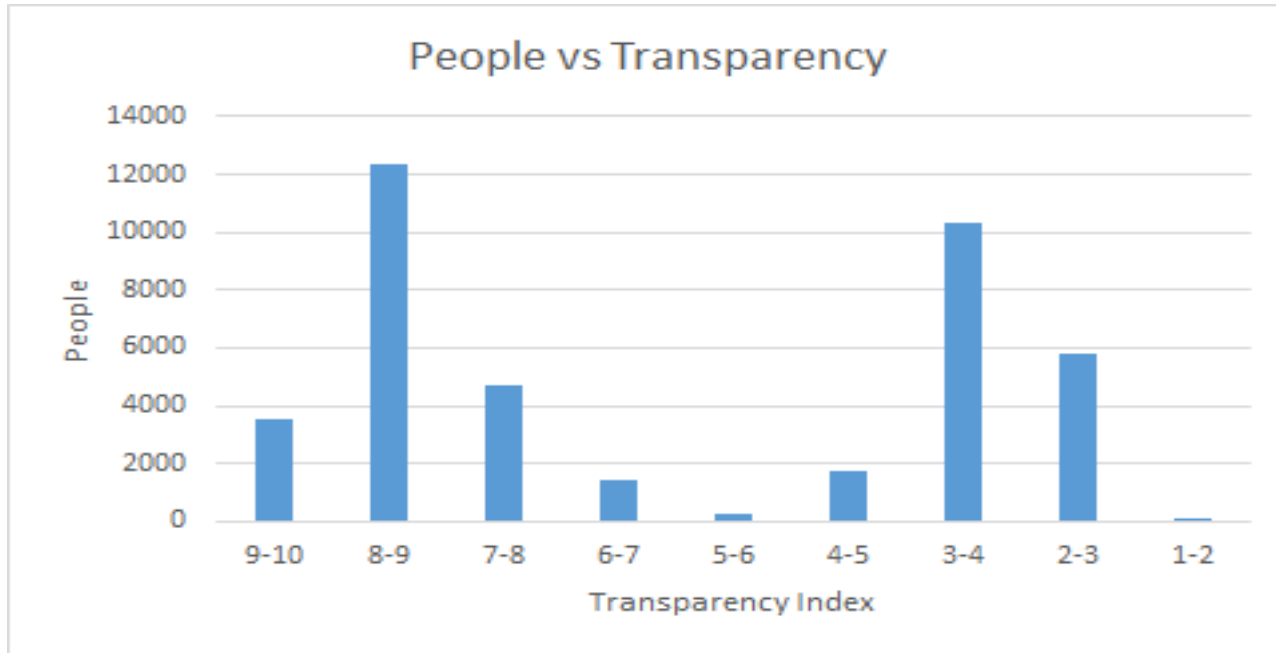
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92 countries

# People vs Transparency - Global

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133 countries

# Result

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- Are extremes of corruption level related to offshore activity?
  - Perhaps yes, but not very conclusive.
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# Clustering - Goal

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- See if clustering method identifies the group of High Income non OECD countries.
  - See if it identifies other meaningful clusters of countries.
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# Clustering - Variables

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Variables	Source
People Involved In Offshore Activities	ICIJ
Number of Offshore Entities	ICIJ
Transparency Index	Transparency International
GINI Index	World Bank
Gross Domestic Product per capita (in dollars of 2014)	World Bank
Government Debt (% of GDP)	World Bank
Imports of Service and Products (% of GDP)	World Bank
Gross Savings (% of GDP)	World Bank
Deposit Interest Rate (%)	World Bank
Real Interest Rate (%)	World Bank
Tax Revenues (% of GDP)	World Bank

# Clustering - Variables

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- Total of 11 variables.
  - ICIJ is sum of data from 1980 to 2010.
  - Transparency Index is from 2010.
  - Other variables are averages of all data available between 2001 and 2010 for each country.
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# Clustering - Variables

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- Only 38 countries had values for all the 11 variables.
  - XMeans clustering algorithm was used.
    - It found 2 clusters.
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# Clustering Results

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Attribute	Full Data (38)	Cluster 1 (13)	Cluster 2 (25)
Transparency	5.34	8.31	3.79
GINI	34.21	30.74	36.02
GDP	19,222.12	42,317.70	7,212.42
Debt	48.28	51.20	46.76
Imports	46.72	36.77	51.89
Savings	24.95	26.50	24.15
Desposit Int.	4.99	2.07	6.51
Real Int.	4.33	3.05	4.99
Tax Rev.	17.04	18.84	16.11
Peoples ICIJ	263.16	180.00	306.40
Entities ICIJ	416.68	256.46	500.00

# Clustering - Trial 2

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- Remove variables that does not appear to affect first clustering trial.
  - Losing these variables increased the countries list from 38 to 80.
  - Run XMeans again.
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# Clustering Results

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Attribute	Full Data (80)	Cluster 1 (23)	Cluster 2 (57)
Transparency	4.97	7.92	3.77
GDP	15,134.50	34,779.34	7,207.63
Imports	49.05	53.13	47.40
Desposit Int.	6.53	2.64	8.09
Peoples ICIJ	439.41	780.78	301.67
Entities ICIJ	671.68	1,229.39	446.63

# Clustering Results

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- Not able to verify how HINO countries were distributed between the 2 clusters.
  - Software and time limitations.
  - Most of HINO countries are probably in cluster 1.
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# Clustering Results

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Attribute	Full Data (80)	Cluster 1 (23)	Cluster 2 (57)	HINO (15)	Std. Dev.
Transparency	4.97	7.92	3.77	5.66	1.91
GDP	15,134.50	34,779.34	7,207.63	19,278.79	10,433.38
Imports	49.05	53.13	47.40	62.88	50.12
Desposit Int.	6.53	2.64	8.09	3.77	3.12
Peoples ICIJ	439.41	780.78	301.67	1,168.33	2,857.68
Entities ICIJ	671.68	1,229.39	446.63	2,256.60	4,729.57



# Conclusion

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- Countries that attract and practice offshore activities are perceived as highly corrupt, have high GDP per capita, and has low deposit interest rates.
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**Thank You.**

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