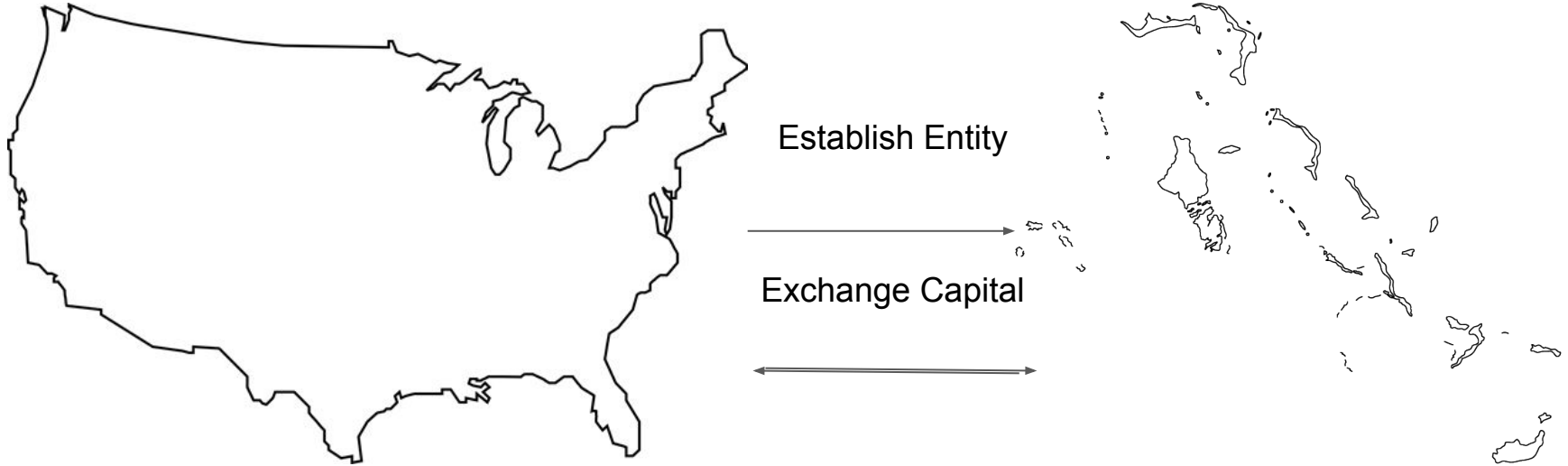


Tax Havens : Network Effects and Policy Interventions

By Michael Rosenberg

Tax Havens: An Overview



- Typical Uses : Tax Evasion
- Atypical Uses : Informal Economies

The Questions

- 1) What gives financial and legal intermediaries social capital within this network?
- 2) What are some policy interventions we can perform to reduce the strength of this network?

Why tackling these problems are important:

- We can identify the responsibility that intermediaries have in holding up this network
- We can find mechanisms to reduce global tax evasion and fight illicit economies

The Dataset : Sources

- ICIJ is an NGO that connects investigative journalists from across the world
- Compiled the Offshore Leaks Database, a graph database that contains relationships among major players in tax haven financing and operations
- Sources:
 - The Offshore Leaks (2013)
 - The Panama Papers (Spring 2016)
 - The Bahamas Leaks (Summer 2016)



The Dataset : Structure



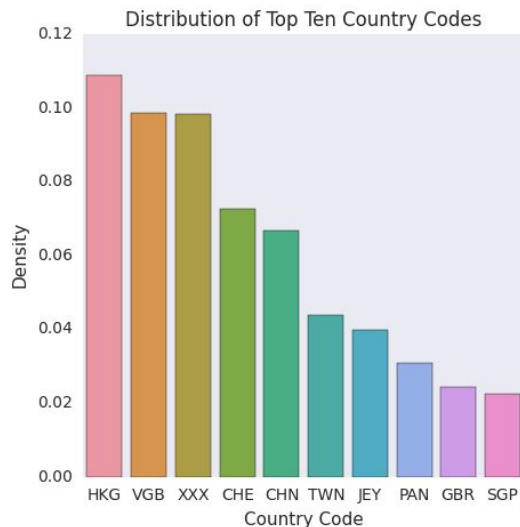
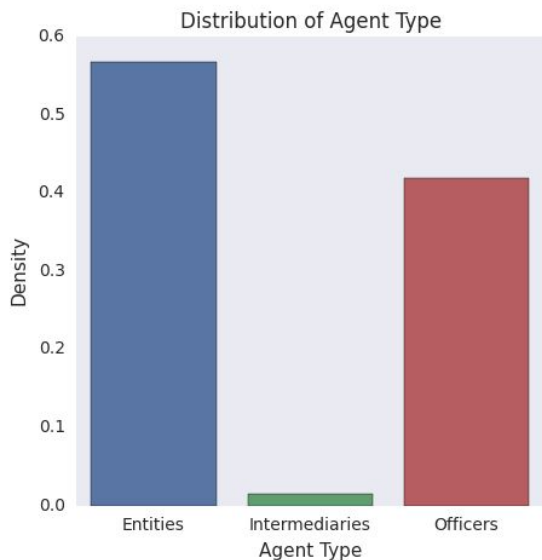
- Four Types of Agents (Nodes):
 - **Entities**: A company, trust, or fund created in a low-tax, offshore jurisdiction by an agent
 - **Officers**: A person or company who plays a role in an offshore entity
 - **Intermediaries**: A go-between for someone an offshore entity
 - **Addresses**: A Contact's Postal Address
- Over 281 Different Types of Relationships (Edges) Represented
 - However, many of them represent the same true relationship

Processing the Dataset

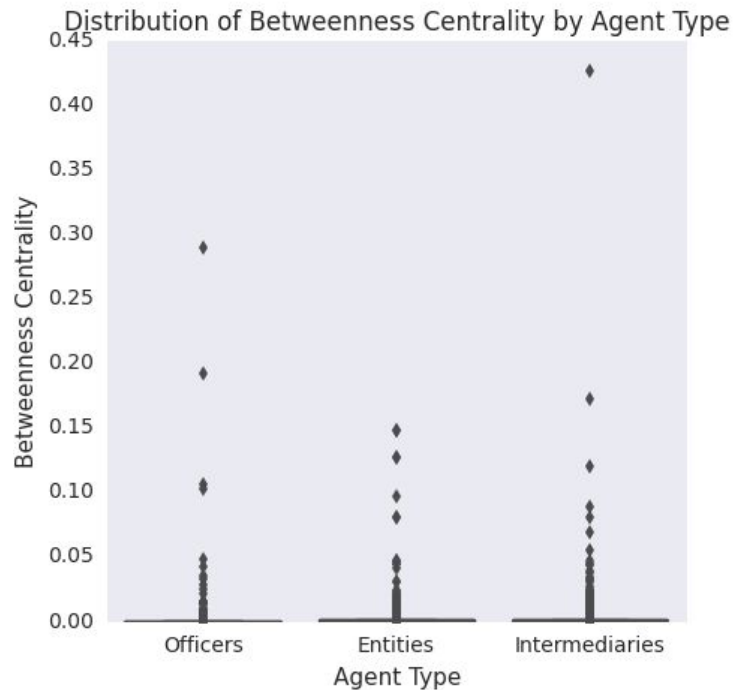
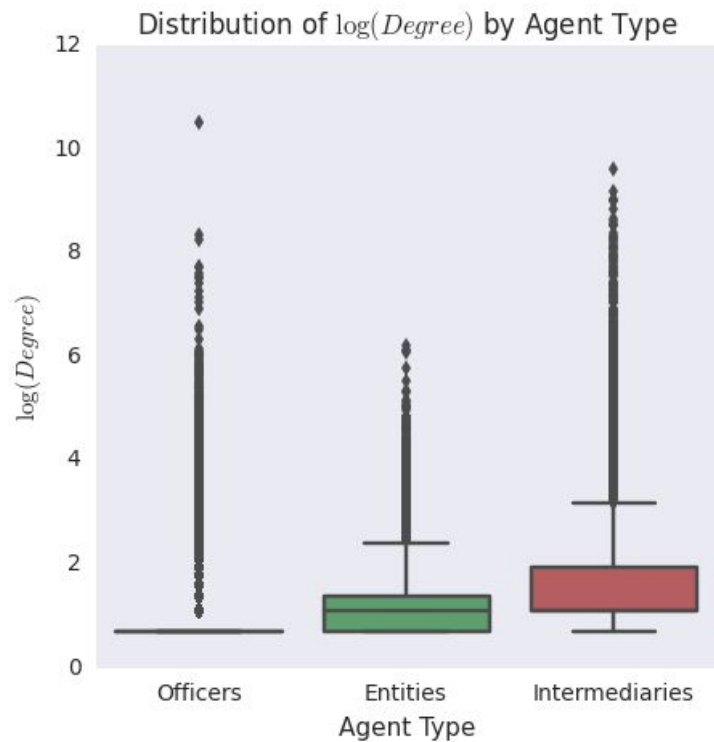
- We need a network of representative business relationships that is simpler than what we now have
- Method to doing this:
 - a. Remove all agents that do not represent financial stakeholders (i.e. Addresses)
 - b. Remove edges that do not represent business-oriented relationships (i.e. disambiguation relationships)
 - c. Consider only top 20 edge types (99.5% of the edge type distribution)
 - d. Consider only largest weakly connected component (81.53% of the agents left over from address reduction)
 - e. Collapse all directed relationships into the undirected “Does Business With” Relationship
- Reduces our node set by 30.35%, edge set by 34.61%

The Canonical Dataset : Summary Statistics

- Agent is either an entity, intermediary, or officer
- Agents A and B are adjacent if A and B do business with each other
- Around 724K Nodes, 910K Edges

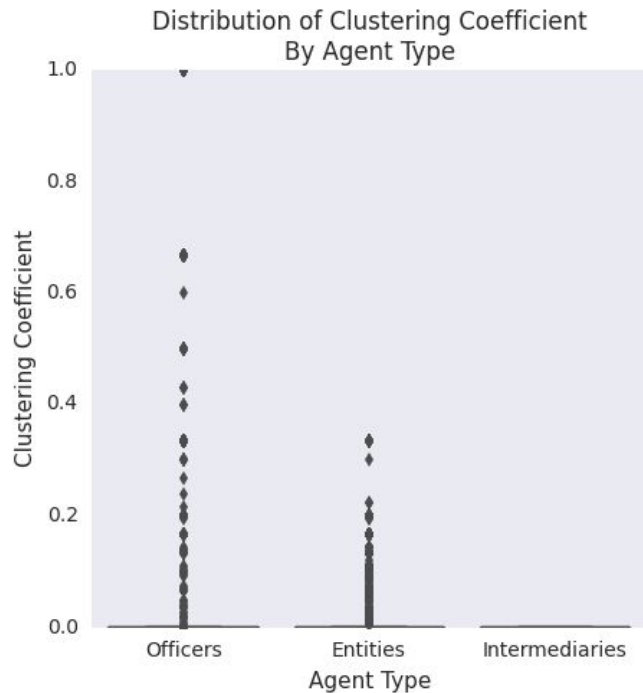


The Canonical Dataset : Network Statistics



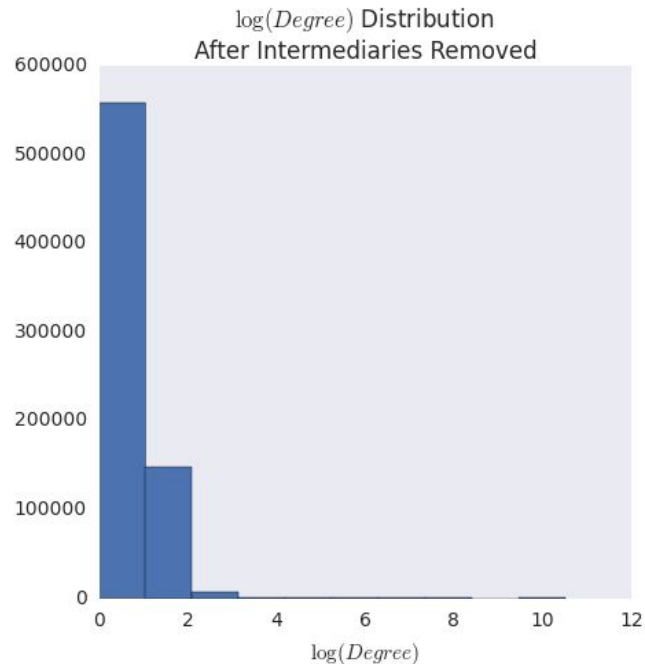
The Canonical Dataset : The Puzzle

- No Clustering for any intermediaries: They are in a fragile part of the network
- Intermediaries are only adjacent to entities
 - They only directly interact between tax havens in this network.

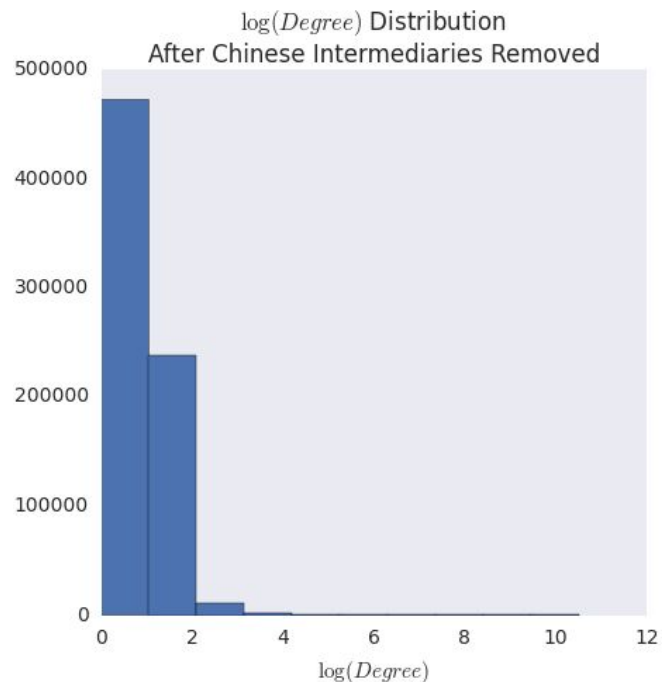


Policy Intervention I : No intermediation

- Governments around the world ban the use of intermediaries for setting up and/or transacting with tax haven entities.
- Shatters our network into 287K connected components
 - Largest Component has 22% of the network
- Hong Kong subnetwork collapses
- Average Degree shifts from 2.5 to 1.4
- Implications:
 - This definitely breaks down the network, but in a manner that seems unrealistic



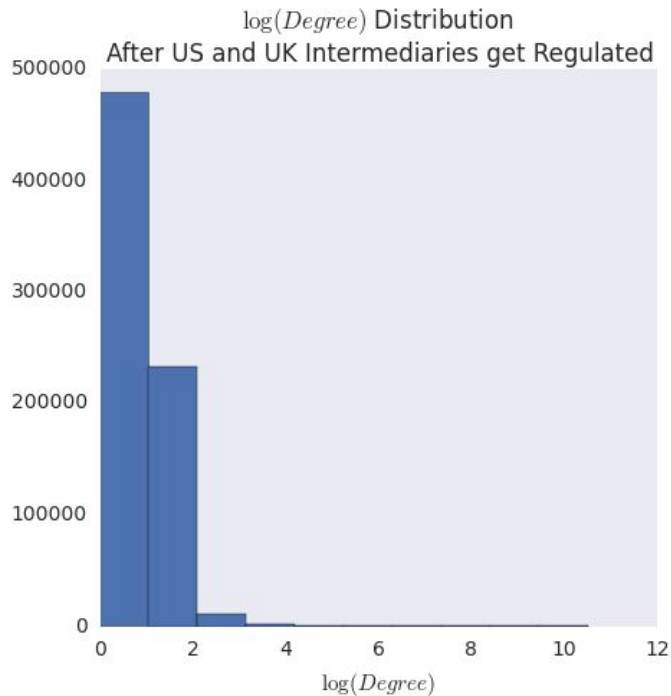
Policy Intervention II : China Cracks Down



- China prevents its financial intermediaries from doing business with offshore tax havens
- Represents about 5% of the intermediaries being removed from the network
- Reduces network to 2.3K connected components
- 99% of the nodes still available are in the largest connected component
- Average Degree stays the same
- Implications
 - It is unlikely that one country alone can reduce this network

Policy Intervention III : UK and US Regulate

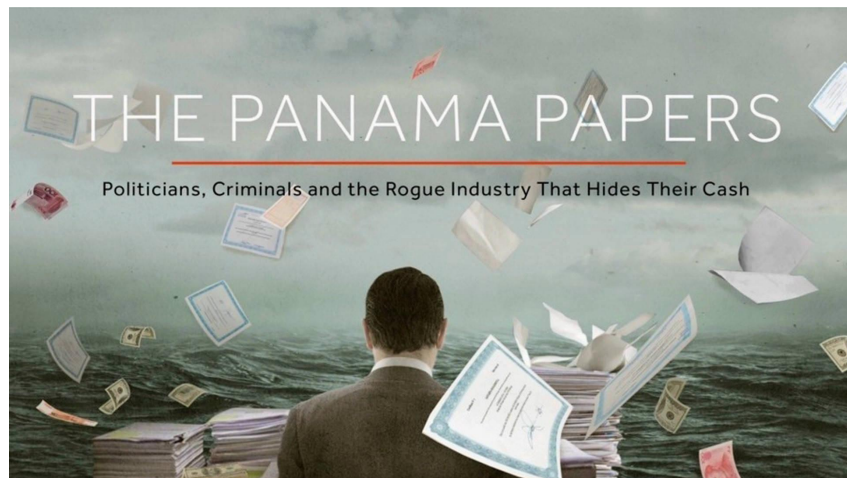
- US and UK cap the number of intermediary - entity relations to 5 per entity
- Removes around 20K Edges
- Shatters network into 12K connected components
- 97% of the nodes remain in the largest connected component
- Average Degree Reduces from 2.5 to 2.45
- Implications:
 - We create a larger magnitude of shattering, but we still do not make as strong of a dent as a total ban



Discussion and Implications

- Power for intermediaries comes from:
 - Being directly connected to a significant amount of entities
 - Being connected in very fragile parts of the network (low clustering)
- We would think that intermediaries would be powerful from connecting distant parts of the network, but current results are uncertain
- To truly break up this network, we need to have a strong multinational coalition working together to dismantle intermediary-entity relationships

Future Avenues of Research



- Use better, faster metric algorithms
- Consider a network with multiple edge types for analysis
- Study the Country-Wise Business Flow
- Build Monte Carlo Simulations of certain policy interventions
- Study social capital of the other agent types in the network

Questions?