

POLITICAL INFLUENCE & POWER

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Follow the Money

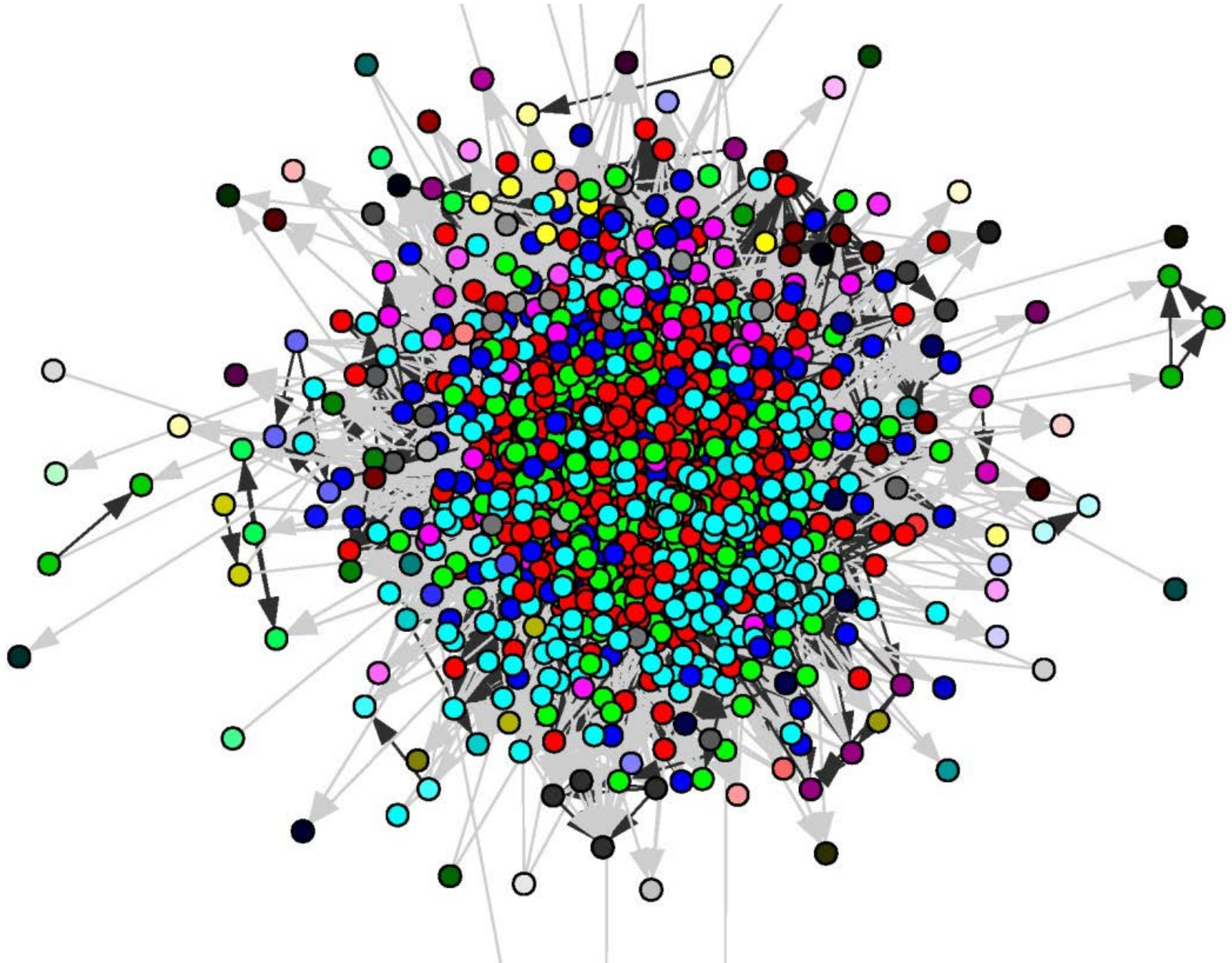
- Campaign finance is dominated by the actions of **lobbyists, PACs, & “political feedback”**
- How can we use a quantitative approach to identifying pathways of influence, and even hubs of power?
- Let’s build and study a...

Socio-Economic Network

Pathways of Influence

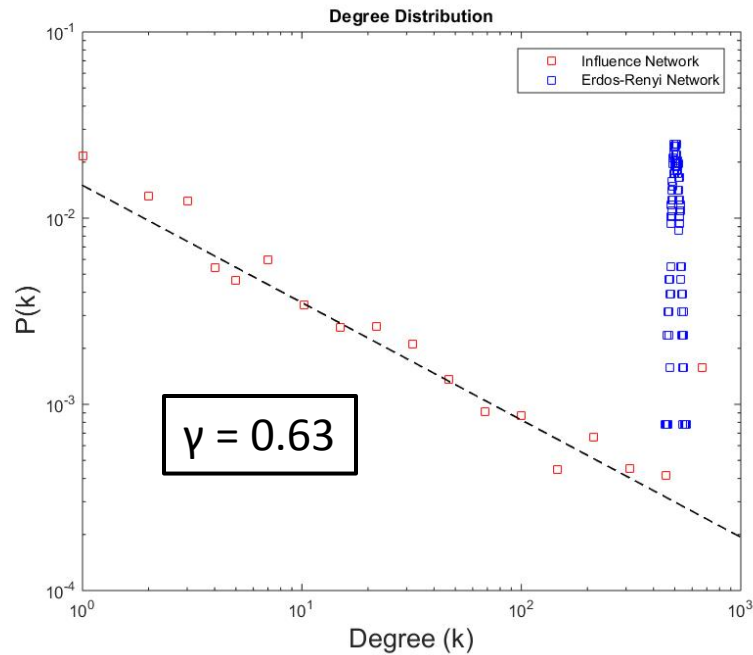
- We initially have a bipartite network:
Committees → **Candidates**
(huge list of transactions)
- This can be projected to become:
Candidates ↔ **Candidates**
- **Two candidates receive a single unique link when they receive a donation from the same committee***

Community Structure of the Influence Network

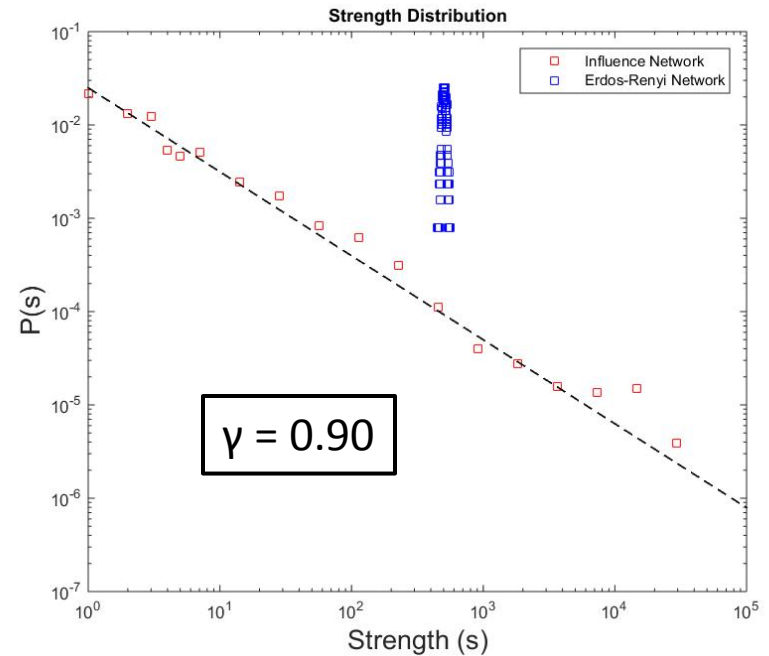


The Degree Distributions

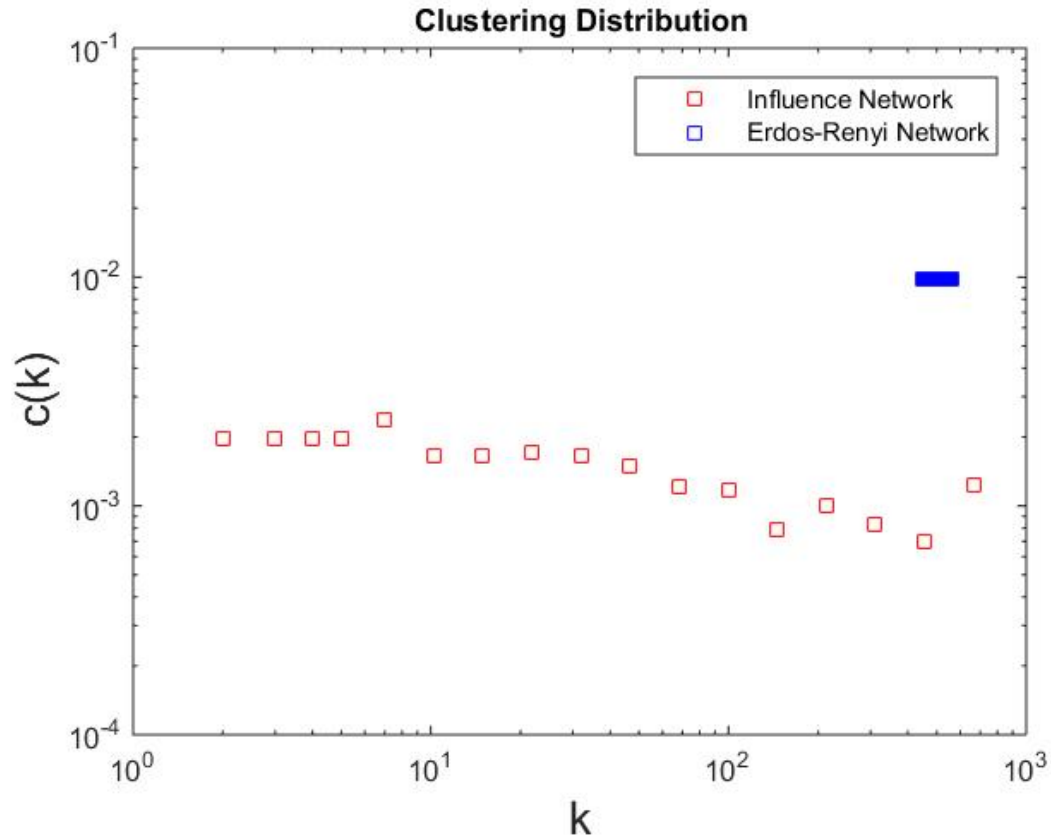
Unweighted (No Multi-Links)



Weighted (Multi-Links Allowed)

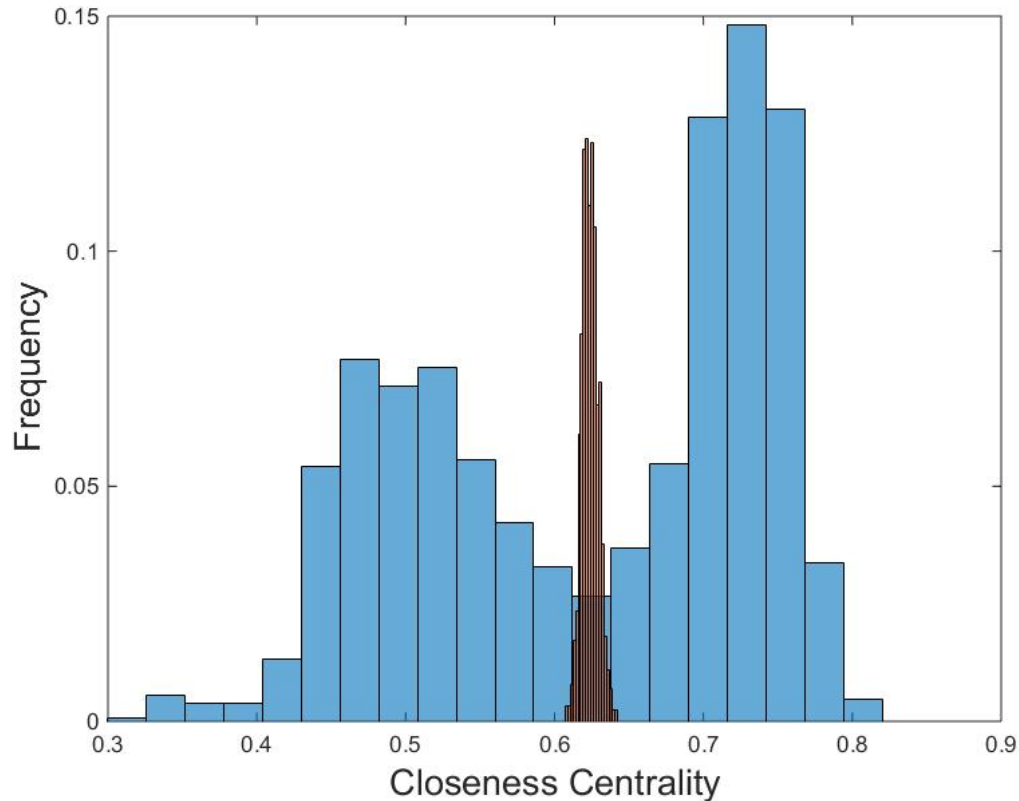


Clustering Distribution



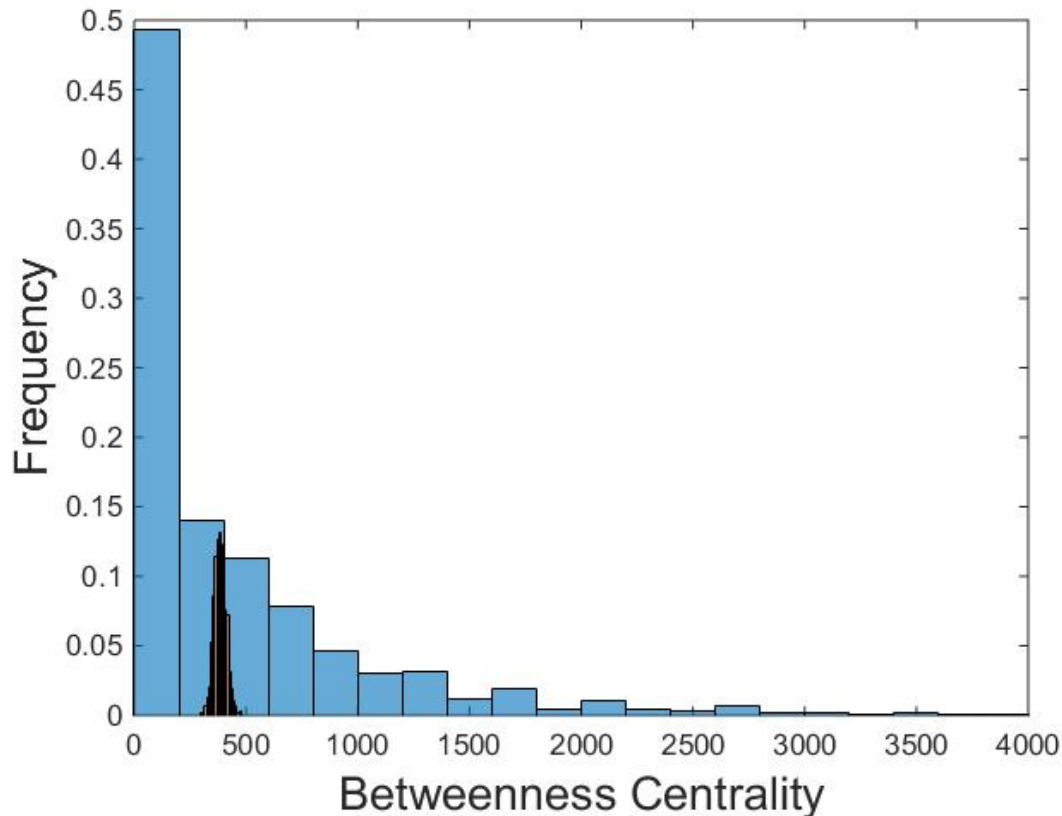
The clustering remained fairly constant over the range of vertex degrees, which is a fairly common occurrence in smaller social networks.

The Closeness Centrality



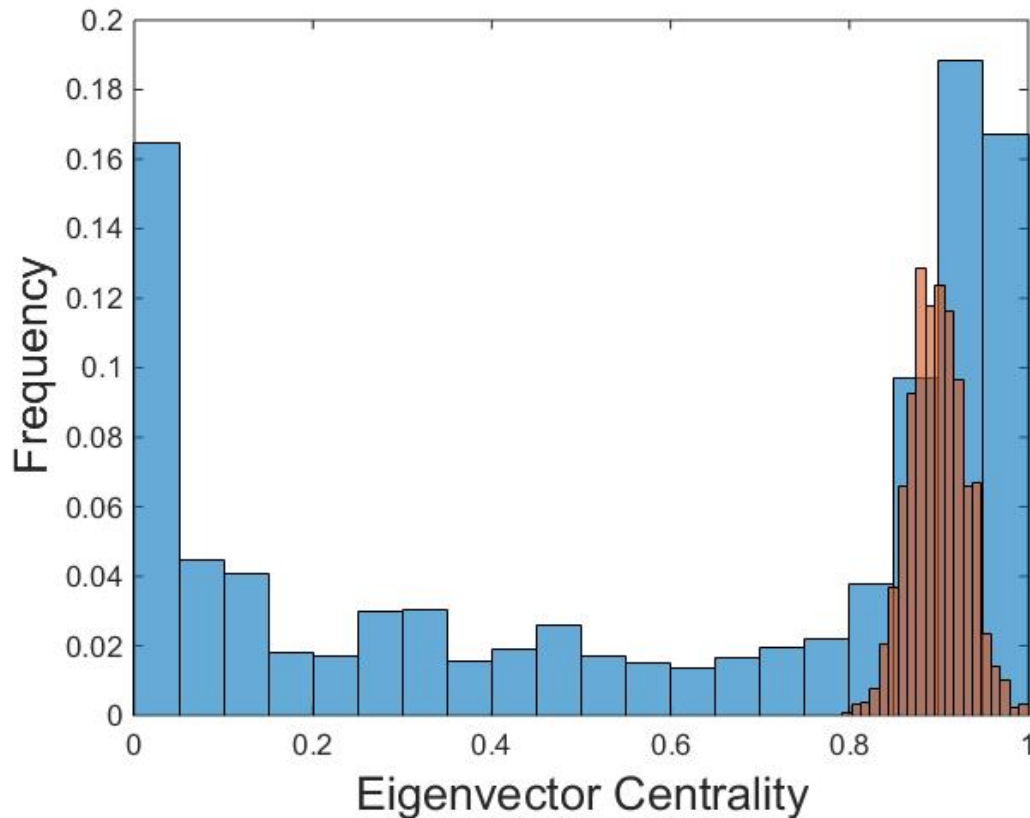
The closeness centrality indicates how easy it is to reach another node from “your” node. In politics, this is a measure of accessibility.

The Betweenness Centrality



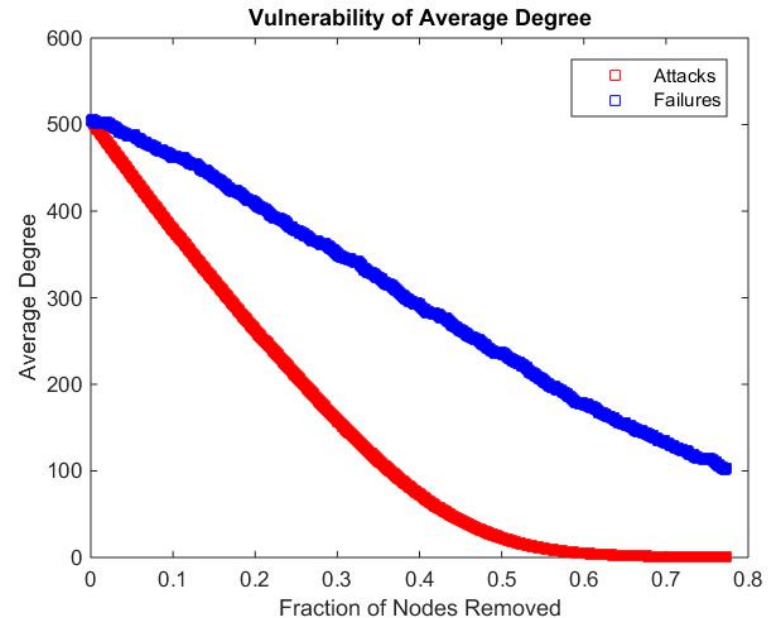
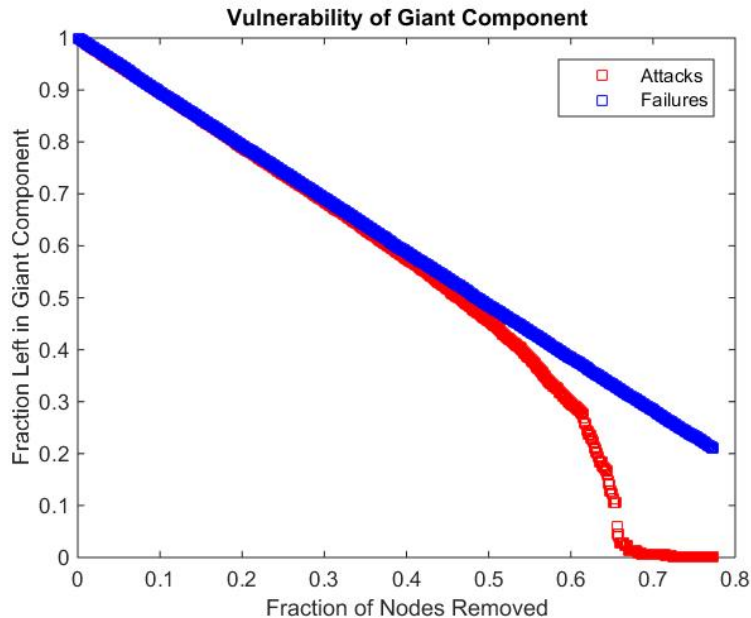
The betweenness centrality indicates how much influence “your” node has over the exchange of ideas. In politics, this is a direct measure of the ability to exchange favors with others to promote your own ideas.

The Eigenvector Centrality



The eigenvector centrality is a measure of leadership in social networks. If you rank highly, you likely interact with others who rank highly.

Network Vulnerabilities



In this network, vulnerabilities more likely indicate the political upset arising from resignation due to scandal, the surprise loss of an election, etc., rather than something extreme like assassination.

Notable Conclusions

- The top 5 candidates with largest degrees all lost the 2014 election! These were tight races.
- The top 5 candidates with the largest strengths (weighted degrees) are all known to be very powerful
- These candidates are all on committees such as Appropriations, Homeland Security, Small Business & Entrepreneurship, Budget, Finance, Joint Economic, etc.

Most Influential Republican: John Cornyn (TX)

Most Influential Democrat: Mark Warner (VA)

Questions?



Numerical Details:

- Size of Bipartite Network: 14612 committees, 5488 candidates, and 231656 transactions
- Projected Network:
 - 1293 candidates (1275 in giant component)
 - Average Degree: 505.457
 - Maximum Degree: 970
 - Diameter: 5.000 (2.000 in E-R)
 - Average Path Length: 1.665 (1.603 in E-R)
 - Average Clustering: 0.864 (0.397 in E-R)
 - Weighted Clustering: 0.923
 - Average Closeness: 0.624 (0.624 in E-R)
 - Average Betweenness: 423.713 (384 in E-R)
 - Average Eigenvalue Centrality: 0.584 (0.913 in E-R)

References

- FEC: <http://www.fec.gov/finance/disclosure/ftpdet.shtml>
- iGraph: <http://igraph.org/python/>