Social Network Analysis within the Great Financial Crisis

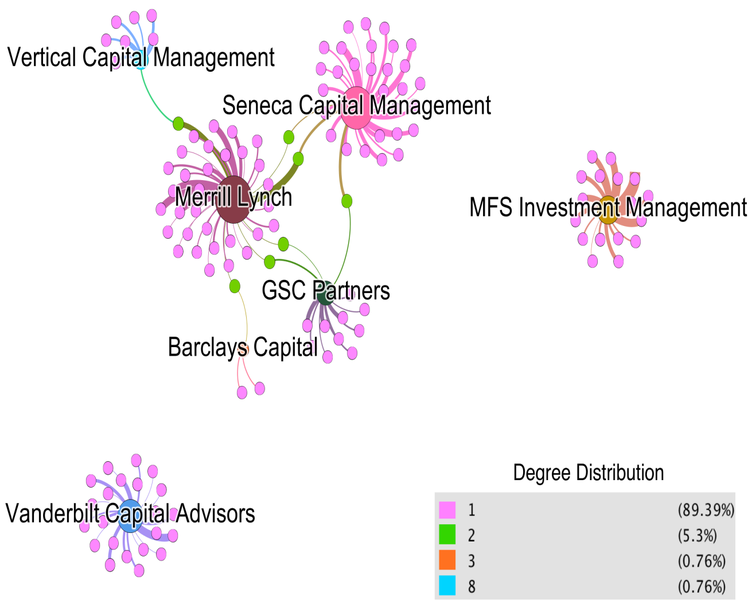
Conor Cullen, Max Fullerton, Alessandro Scibetta, Farrel Zulkarnaen

1. Introduction

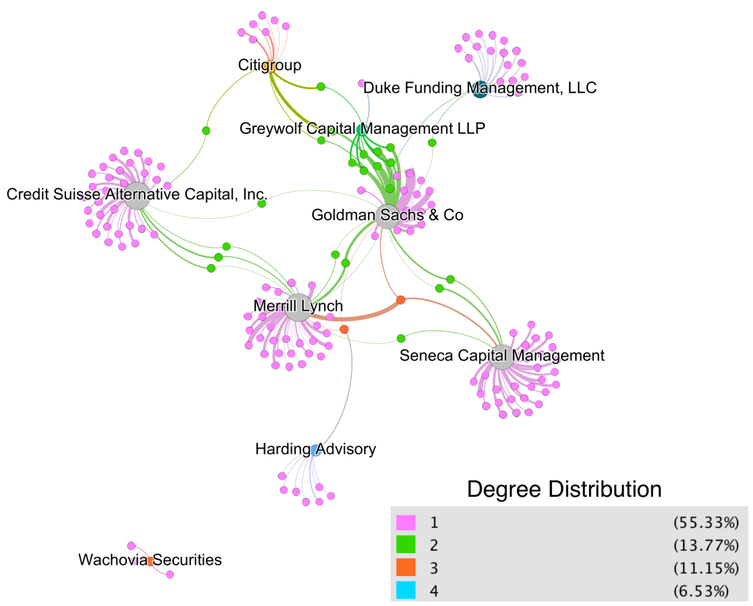
- The Subprime Mortgage Crisis of 2008 is thought to have been indirectly caused by the recycling of risky debt into so-called riskless investments inside Collateralised Debt Obligations (CDOs)
- This encouraged the issuance of mortgages to borrowers who were unlikely to repay their loans, leading to a domino-like collapse on the false promises made by the CDO market
- Our objective is to infer how the social networks which arose from CDOs, their Collateral Managers (CMs) and other associated firms can give insight into the cause of the Great Financial Crisis.

2. Social Networks

The colours of nodes in the networks are characteristic of their degree



Social network of actors employed by firms associated with CDOs that performed well during the crisis



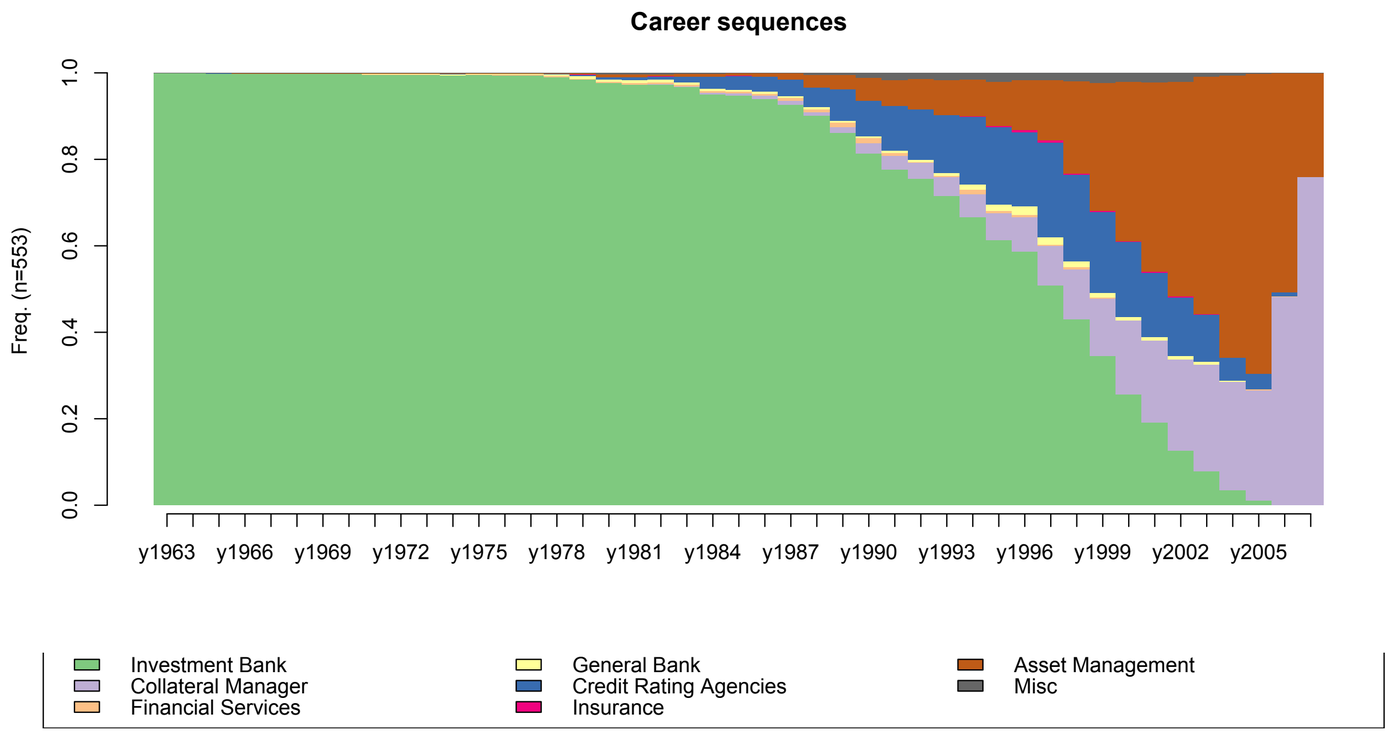
Social network of actors employed by firms associated with CDOs that performed poorly during the crisis

3. Performance Rating and Career Progression

We measure the performance of each CDO by means of a composite rating system based on its reported credit rating at different points in time. The table below shows the logarithmic rate of downgrade for both the best performing (top 5) and worst performing (bottom 5) CDOs:

Rank	CDO Name	Rate	CM	Bank
1	Newbury Street	-11.54	MFS Investment	Merrill Lynch
2	Pampelonne I	-11.91	Vertical Capital	Barclays
3	Fort Sheridan ABS	-12.09	Vanderbilt Capital	Merrill Lynch
4	Caldecott I	-12.15	Seneca Capital	Merrill Lynch
5	GSC ABS	-12.16	GSC Partners	Merrill Lynch
⋮	⋮	⋮	⋮	⋮
51	Broderick II	-15.01	Seneca Capital	Merrill Lynch
52	Duke Funding III	-15.53	Duke Capital	Wachovia Securities
53	Adams Square II	-15.99	Credit Suisse	Citigroup
54	Octans I	-16.96	Harding Advisory	Merrill Lynch
55	Timberwolf I	-18.06	Greywolf Capital	Goldman Sachs

Career distribution plot showing the sequence of state frequencies by position in time:



4. Conclusions

- Clustering coefficient measures the degree to which nodes in a graph tend to cluster together. The network comprised of the best 5 CDOs has an average coefficient of 0.23, whereas the social network showing the worst performing CDOs has an average coefficient of 0.13, inferring a more interconnected network
- Exponential random graph modelling shows that the probability of the formation of transitive structures (i.e. friend of a friend) in a randomly generated network is 0.4946 and 0.4952 in the respective networks
- Analysis of these metrics suggests that there is a correlation between highly connected career networks and higher rates of CDO downgrades.