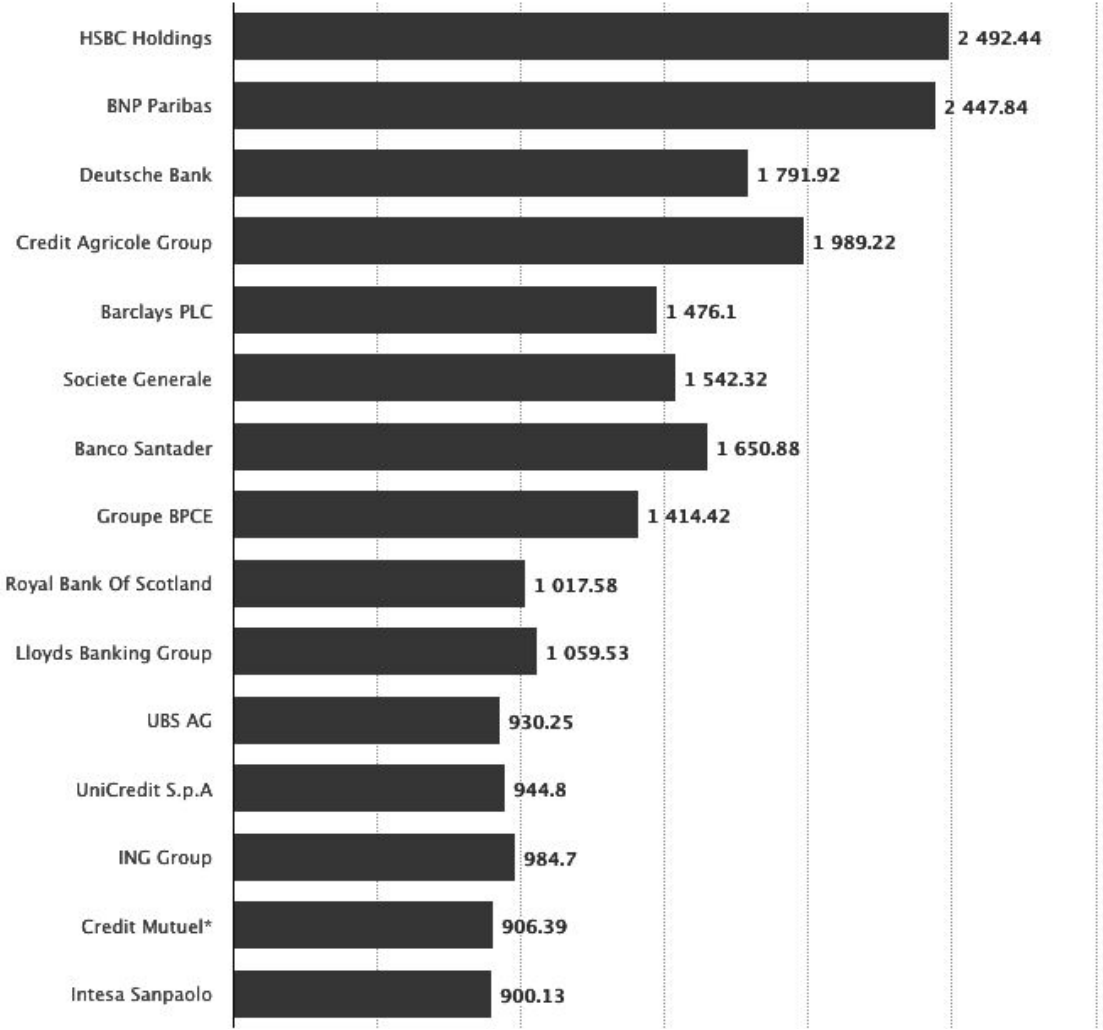
Financial systems: a network perspective

Paolo Barucca - UCL

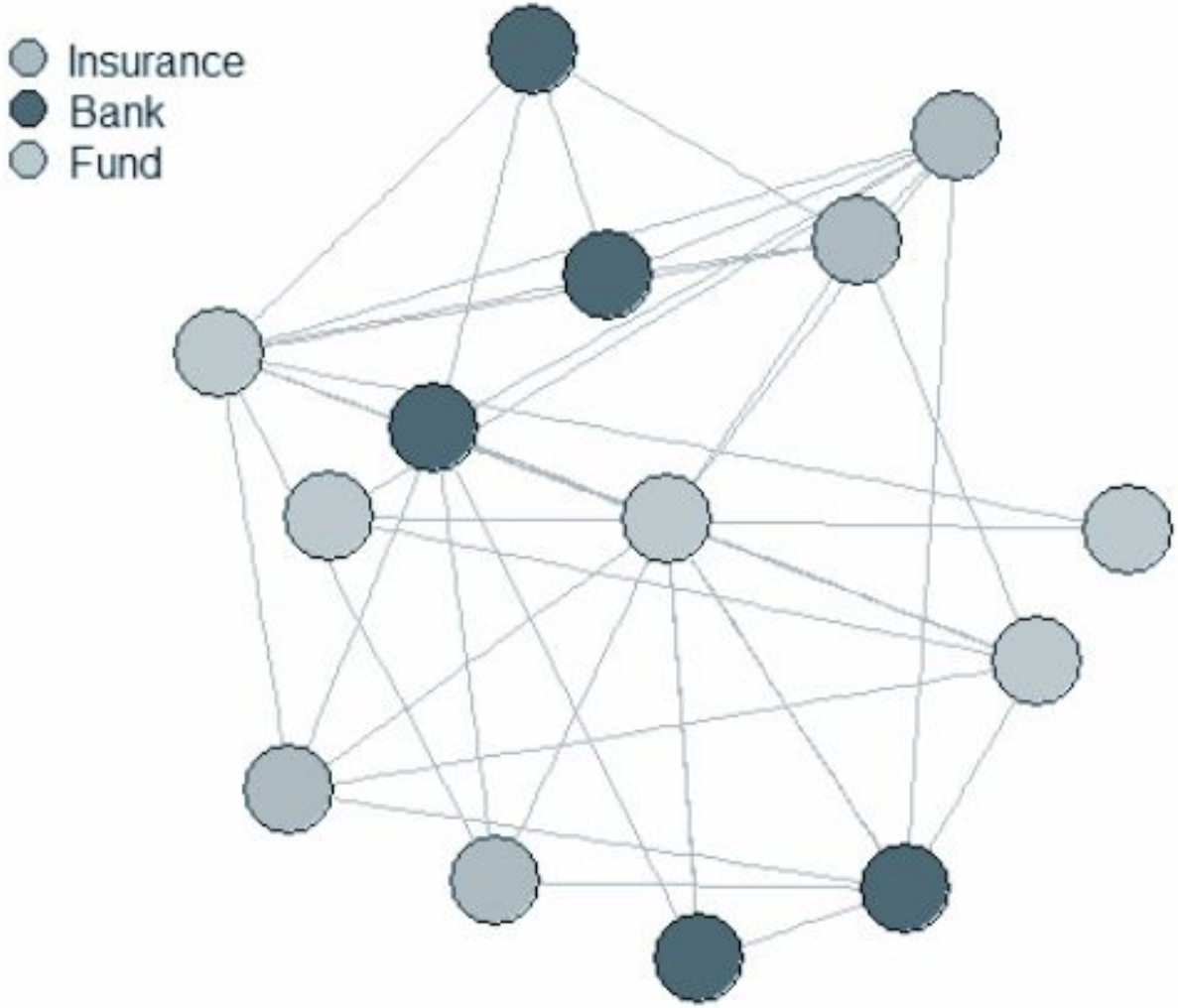
Dolfins project

No networks, just balance sheets

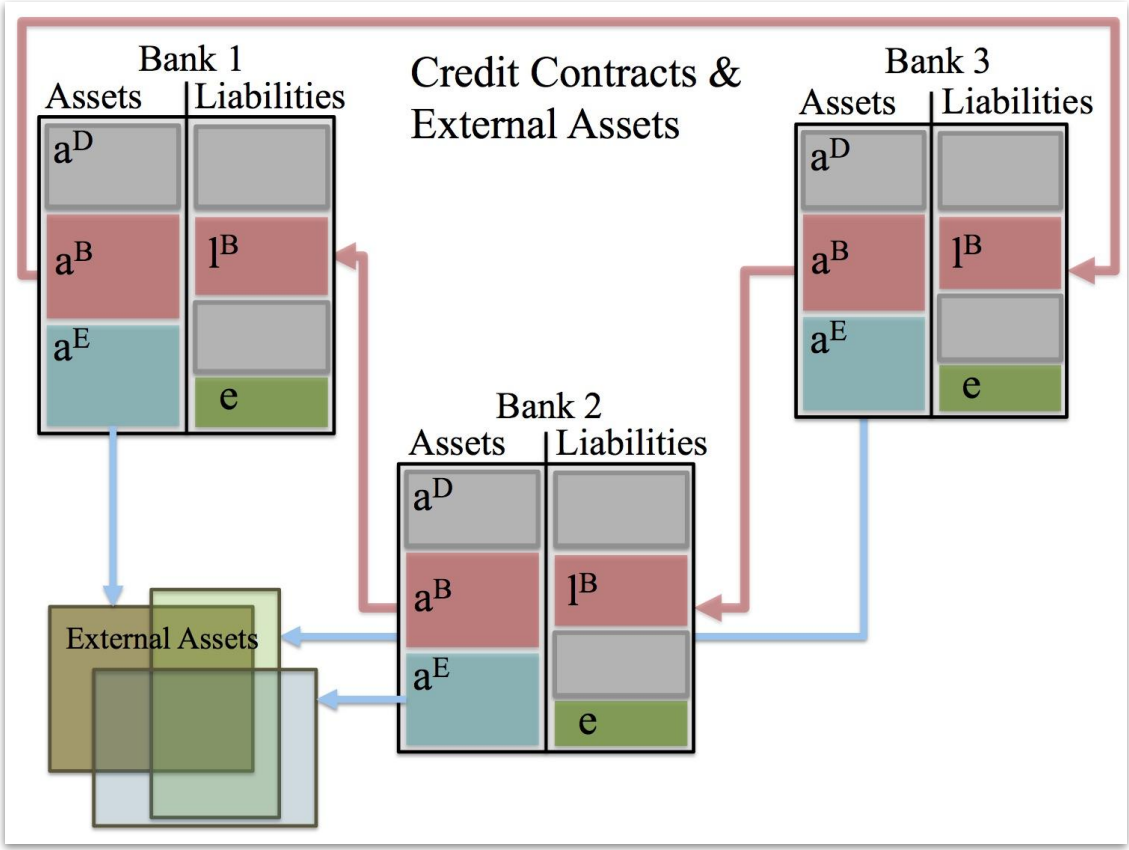


Monopartite networks

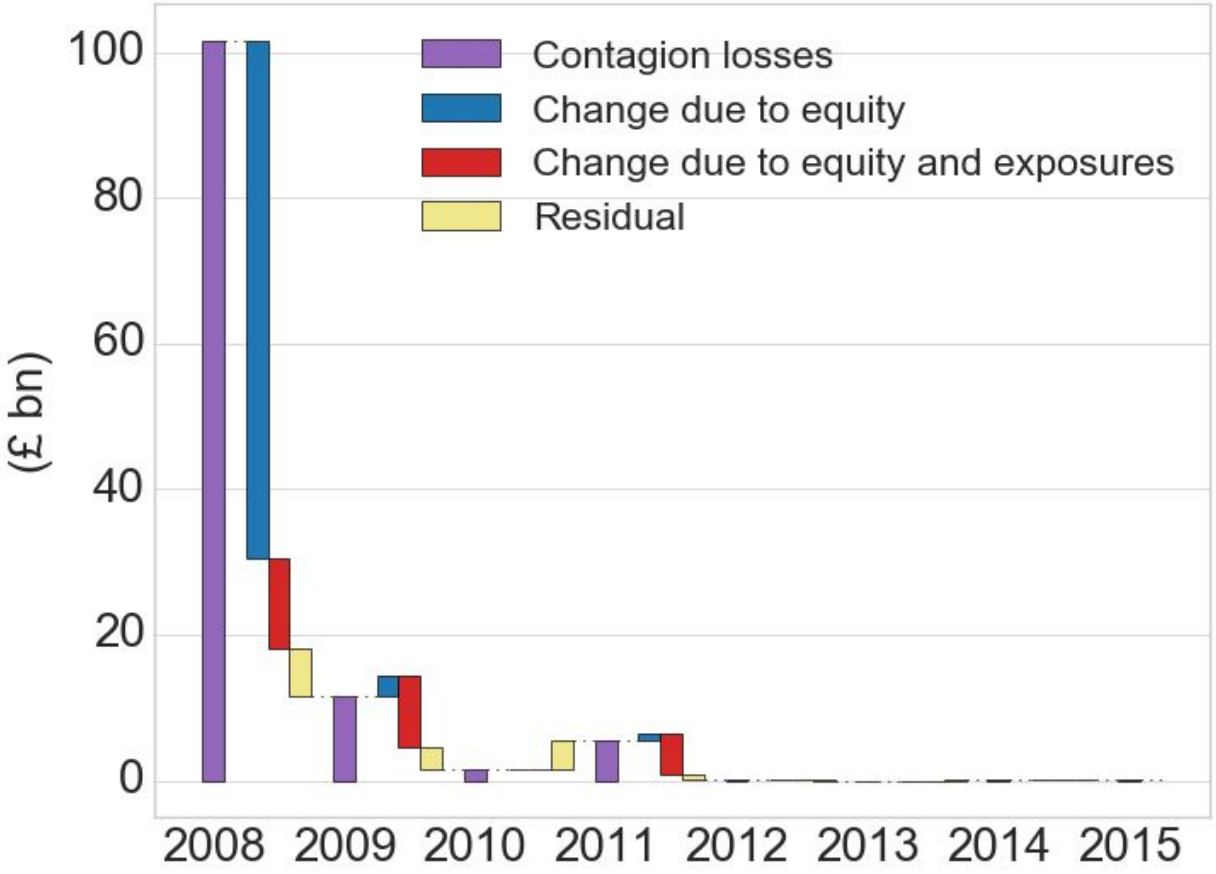
Network of financial contracts



A typical framework

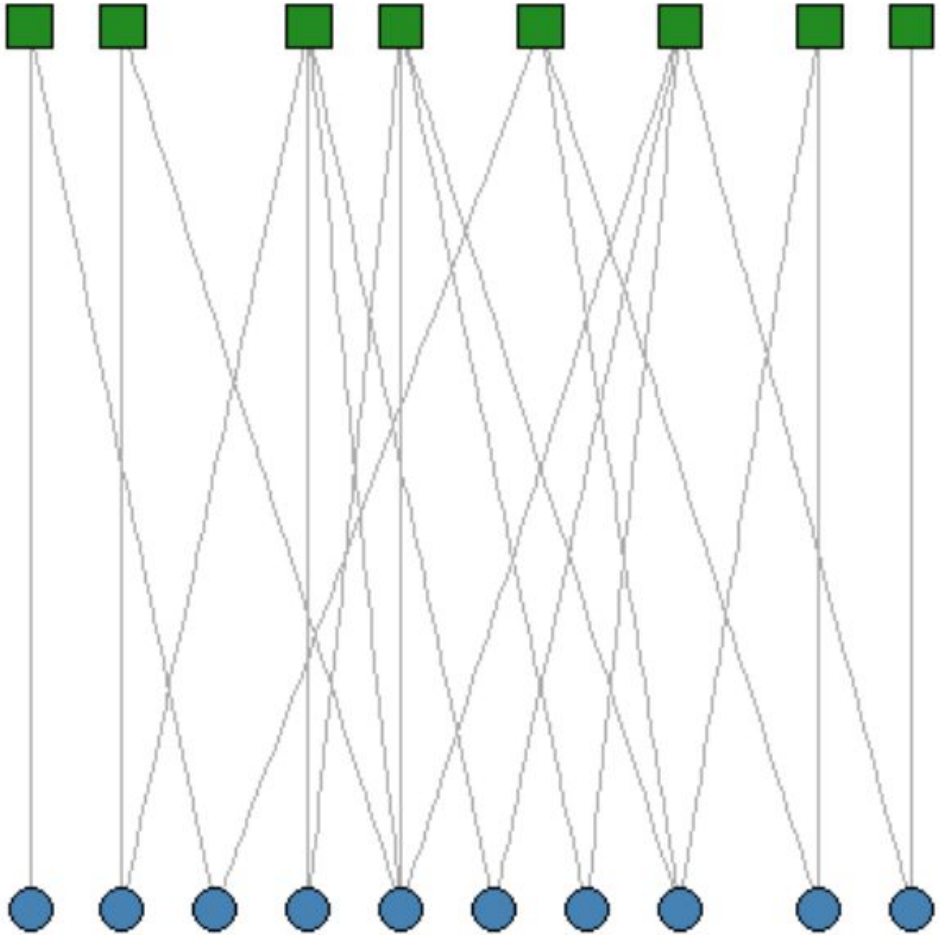


Direct solvency contagion based on regulatory data on unsecured loans in the UK (2008-2015)



Bipartite networks

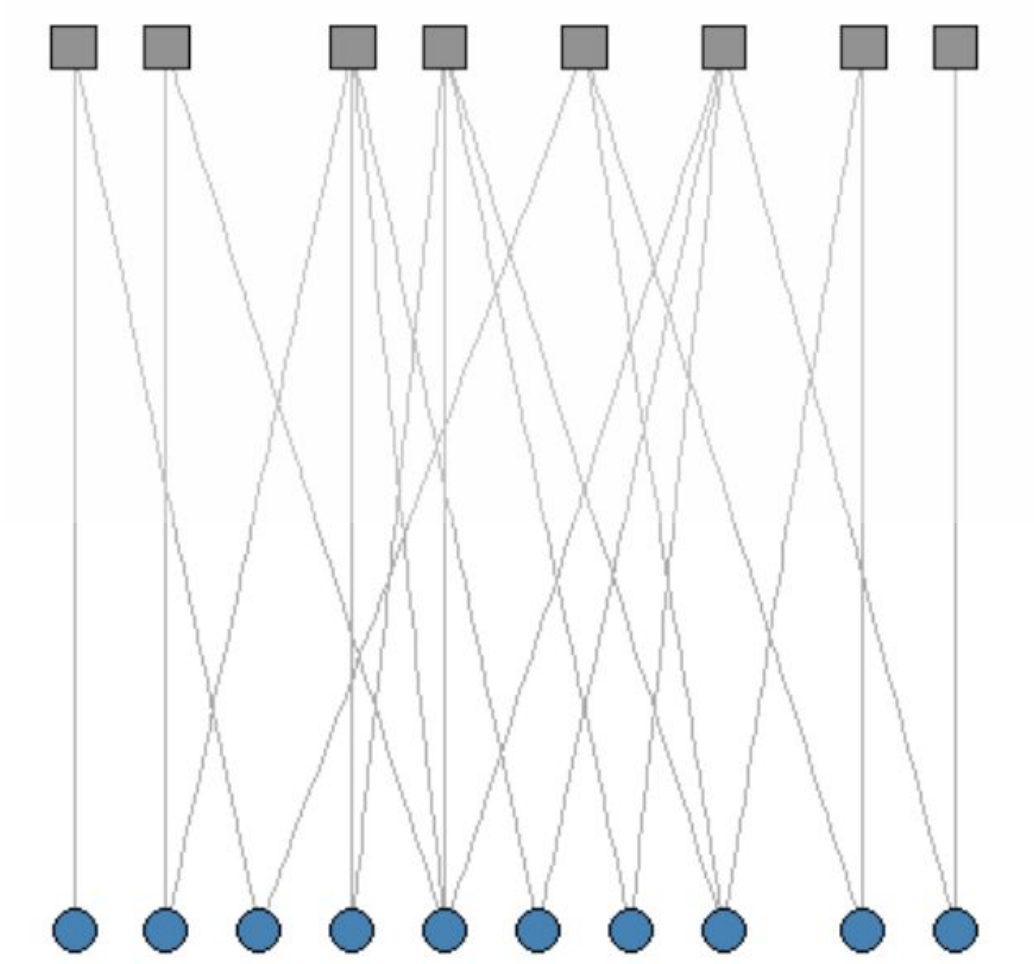
An alternative, and more general, representation of networks of contracts



Contracts

Financial Institutions

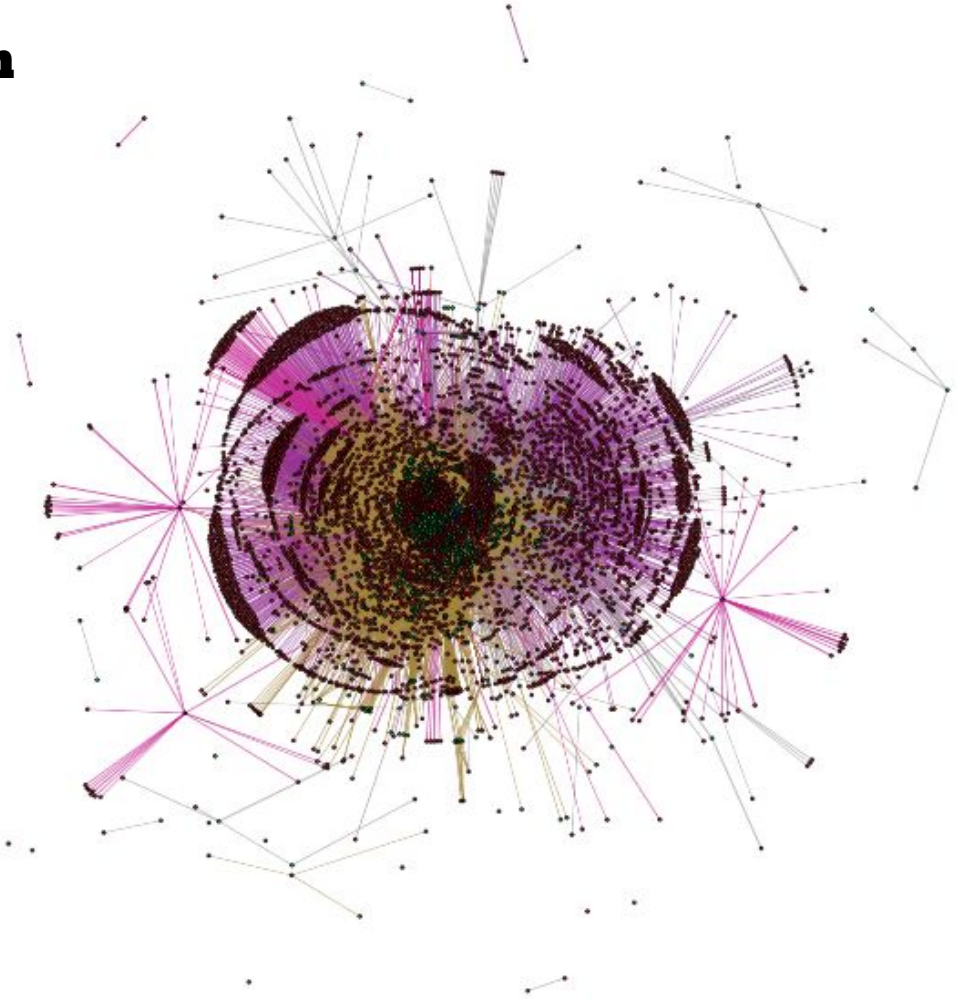
A natural representation for security holdings



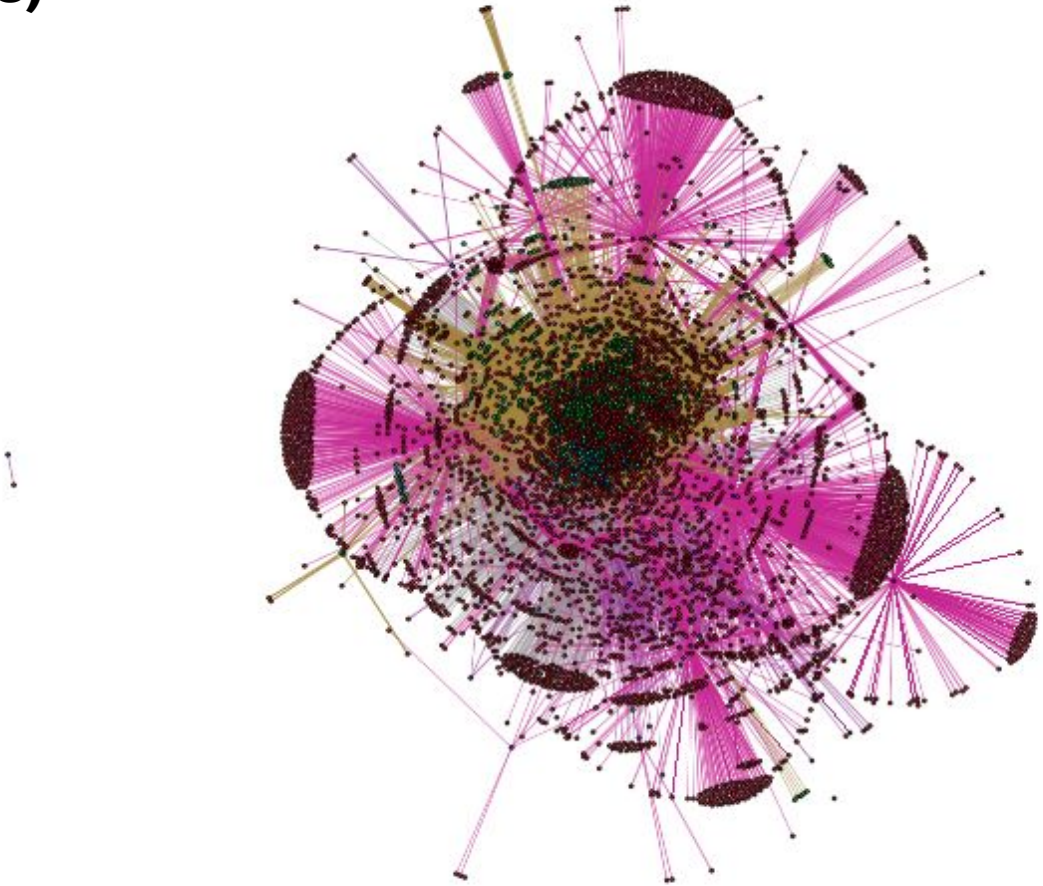
Securities

Financial Institutions

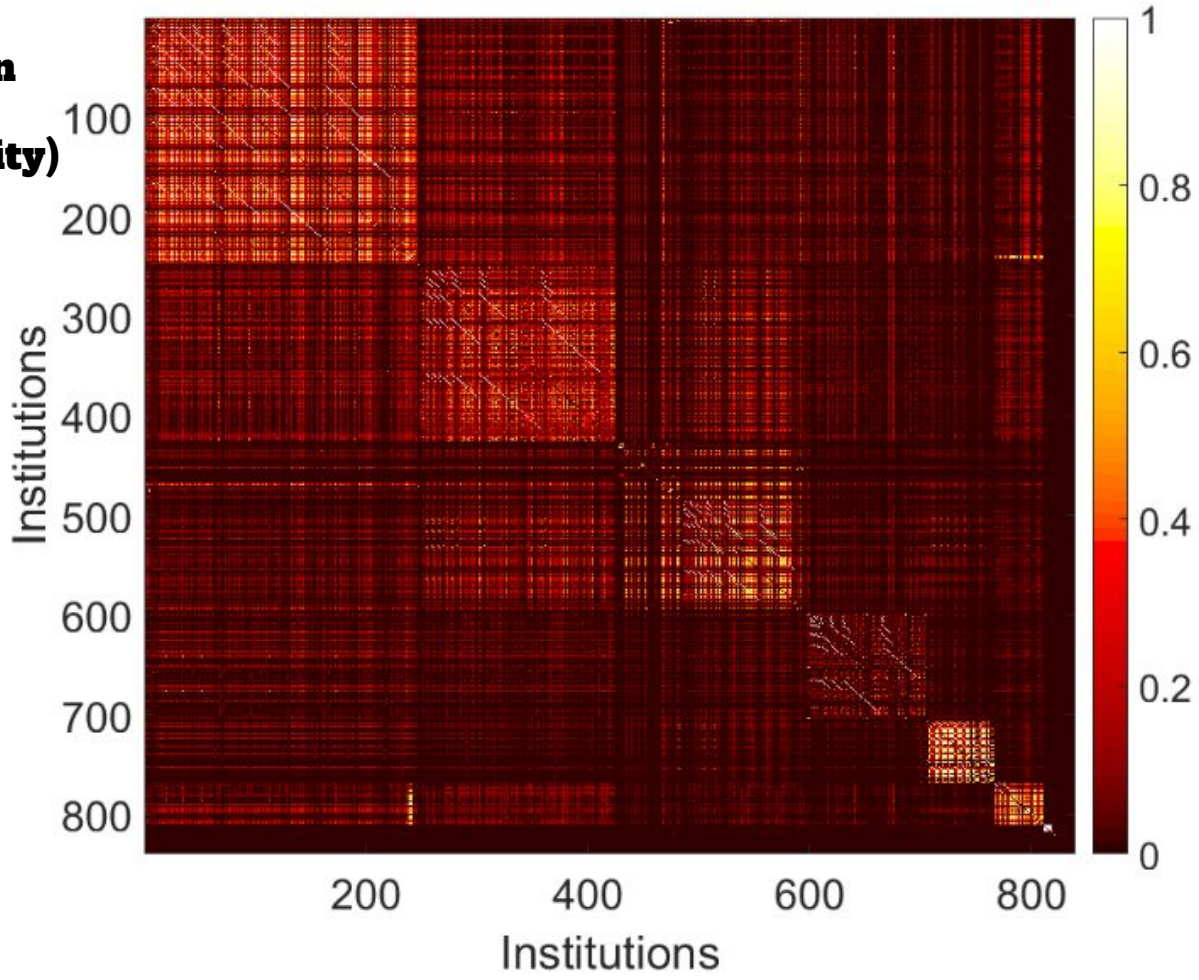
In reality…
equity holdings in the UK (Q1 2016)



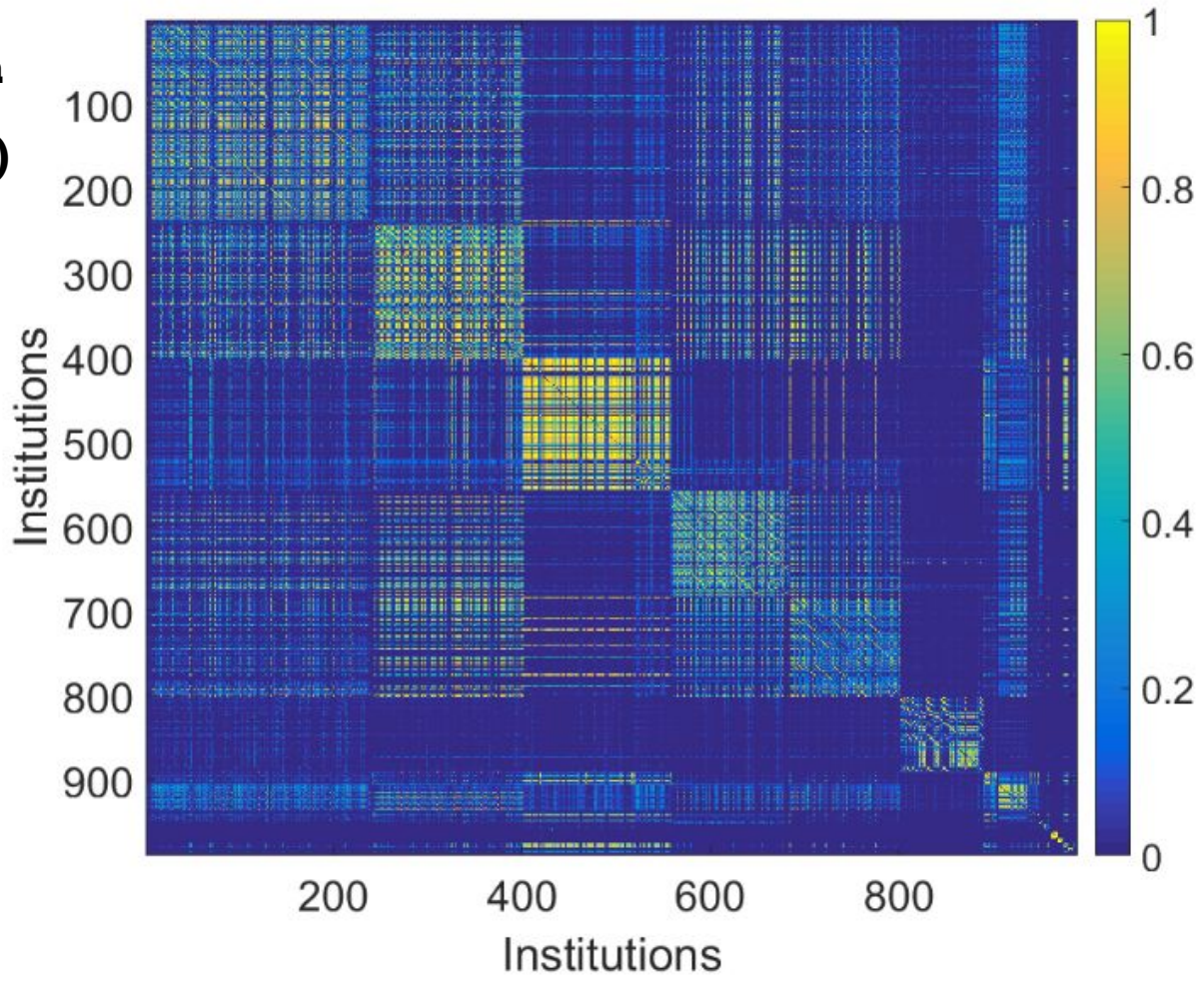
Debt holdings in the UK (Q1 2016)



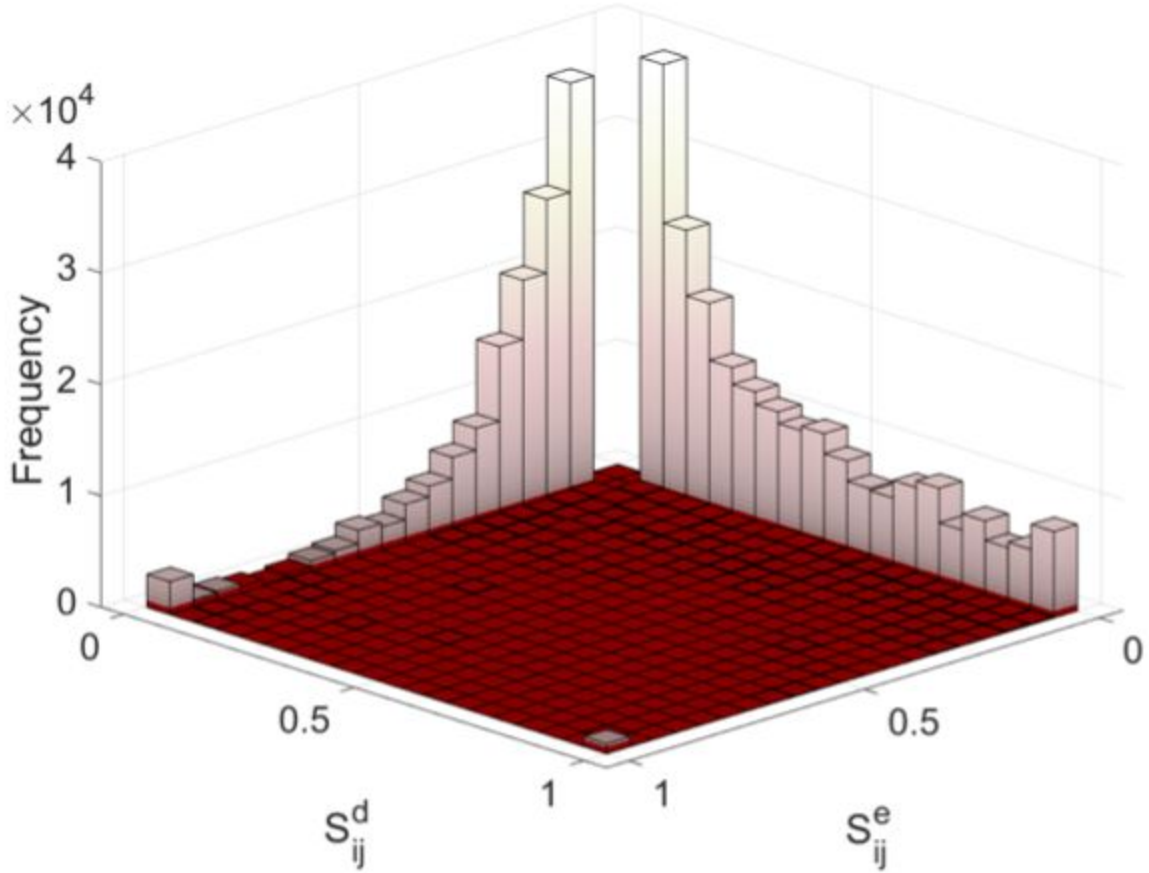
Back to a monopartite representation in terms of similarities (equity)



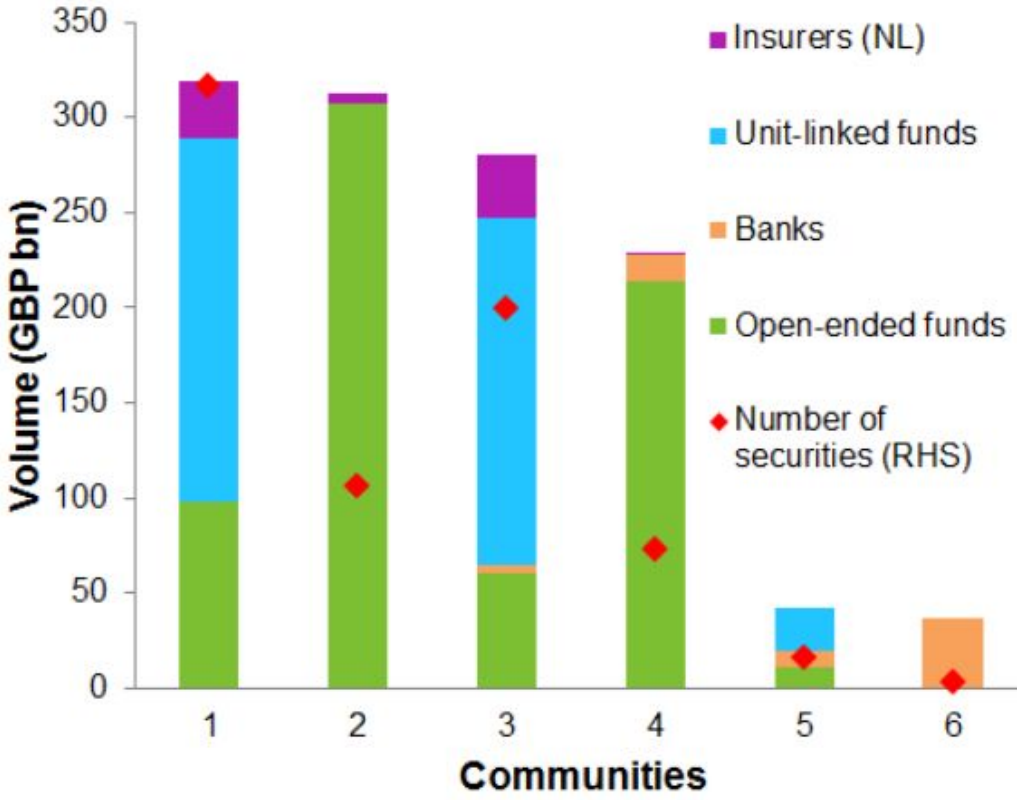
Back to a monopartite representation in terms of similarities (debt)



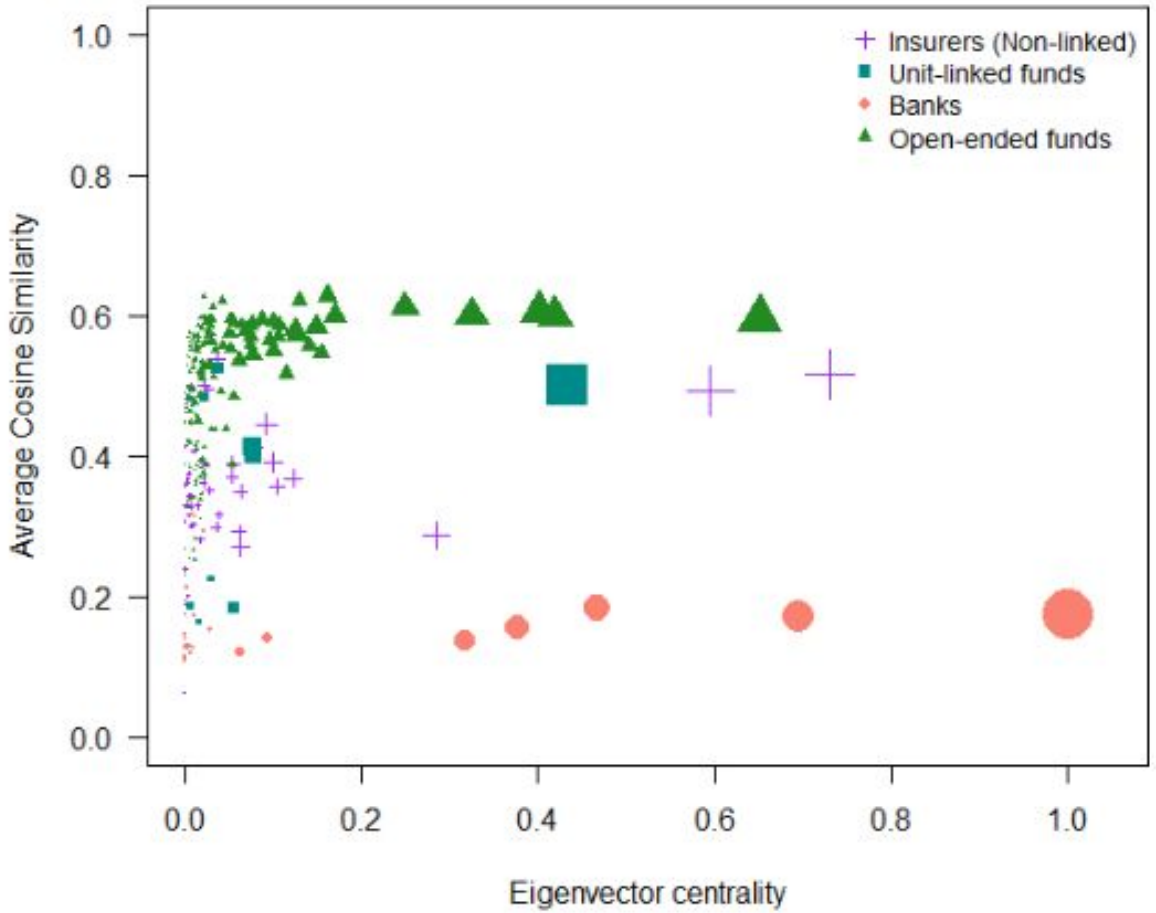
Weakly correlated layers



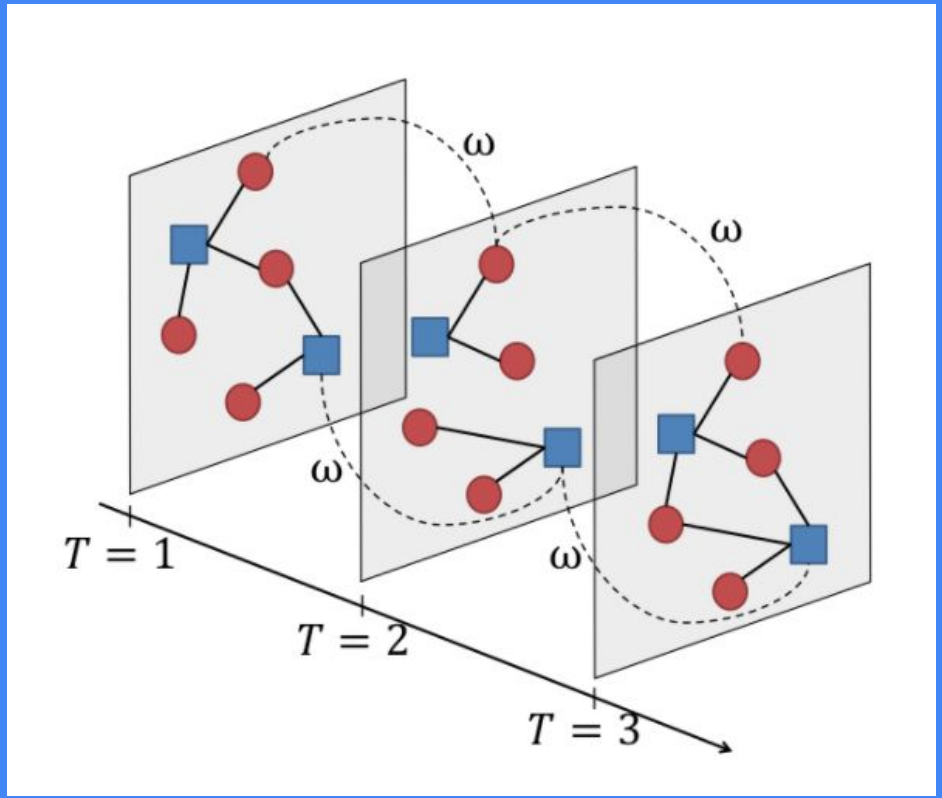
Different types of financial institutions share high similarities and fall in the same communities (equity layer)



Price-mediated contagion based on stylized portfolios in the UK (Q1 2016)



Future perspective: representing financial systems as dynamic bipartite graphs, where both contracts and security holdings vary over time



Representation of a dynamic bipartite graph from Math. Institute at Oxford

Dolfins project