Discussion: Credit rating migration risk and interconnectedness in a corporate lending network

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Aggregate credit risk and interconnectedness of the Japanese credit network

The Paper conducts a credit risk portfolio analysis at the level of the aggregate japanese lending network. Indeed following the default of Lehman and the worldwide spreading of financial distress, contagion has become a key area of credit risk particularly for Financial Stability purpose.

Only listed firms are part of the analysis here with lending provided by banks and insurance companies.

- **Computation of the aggregate risk measures** either VaR or ES overall
- **Properties of the lending network**.

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This is comparable to Godlewski-2012 or Cont-2011, mapping the existing relationship to a directional network, even if here the focus is more generic and captures bank to corporate interconnexion, and not simply the intra-banks relationship.

However one of the key element provided here is the analysis of the evolution of the network.

What is the proportion of the overall credit market captured by such analysis ? Importance of the Asset Mangement Company as creditors of public firms ?

Aggregate Credit Exposure

The relationship between borrower and creditor is measured through theoretical prices, where those are defined as:

$$P = E\left[\sum_{t=1}^{Maturity} \frac{CashFlows_t}{(1 + r(Rating_t))^t}\right]$$

This choice raises a number of questions:

- *Why not using directly the debt nominal amount ?*
- *Why a stochastic rating evolution to compute the current price ? And not a single constant spread assumption according to the current rating ?*
- *What is the proportion of rated entities ?*

Risk Measures

From the cartography of risk relationship, the analysis provides readers with structure of the debt market:

- the size of loans,
- the type of creditors and their change through time, notably the Govenment FI,
- a potential issue with the Unknown category.

Then extrem risk measures (VaR and ES: *Are they stand-alone measures or contribution to the global measure ?*) are computed based on a multifactor Gaussian copula, with several sensitivity analysis (Dependance structure, Rating Transition used). The exact value of those measures is extremely dependant upon the underlying assumptions, so their real interest lies with the comparison between entities or through time.

Analysis of the network

(a)

Loans ⟶

A   B   C   D

Lenders ⟶

1 2 3 4 5 6 7 8 9 10 11

(b)

3
2
1
4
5
6
7
8
9
10
11
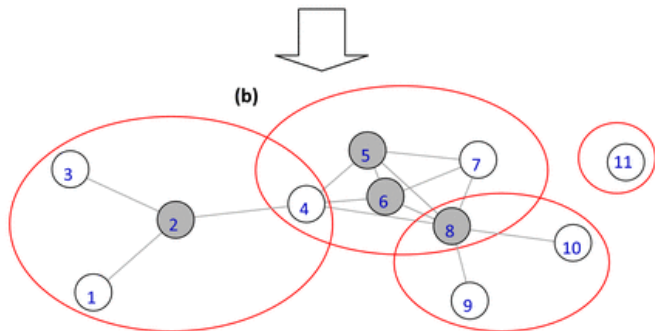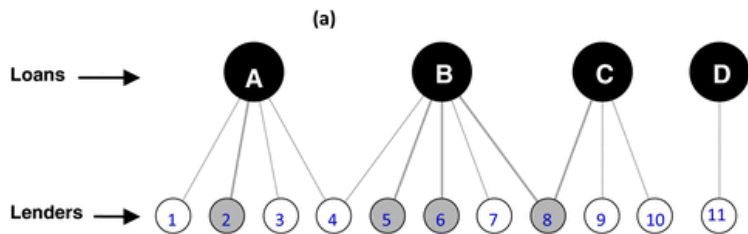
Source: Godlewski 2012.

Analysis of the network

The properties of the network are analysed in terms of centrality measures and their time evolution, using several different related centrality measures (Degree centrality, Eccentricity, Eigenvector centrality, HITS hub centrality). All show a break for FY2012 and FY2013. Quasi all those measures are here linked to the break in the network size during those same years.

The lending network has one step connections (corporate borrower - finance lender): do those measures have the same adequacy to describe such network ?

The structure of the network emphasizes the balance between two extremes cases for network:

- ▶ a very centralised system where the core network needs to be extremely well protected (think CCP);
- ▶ an extremely granular system where no single borrower could create ripples in the network.

What are the potential policy implications ? Breaking up the debt of large borrowers or regulating more closely the largest creditors (G-SIBs) ?