Cambridge Judge Business School

Centre for Risk Studies 7th Risk Summit Research Showcase

Modelling the Interplay Between Personal and Collective Agencies

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Centre for **Risk Studies**

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Sorts of Organisational Issues Identified by the Risk Function

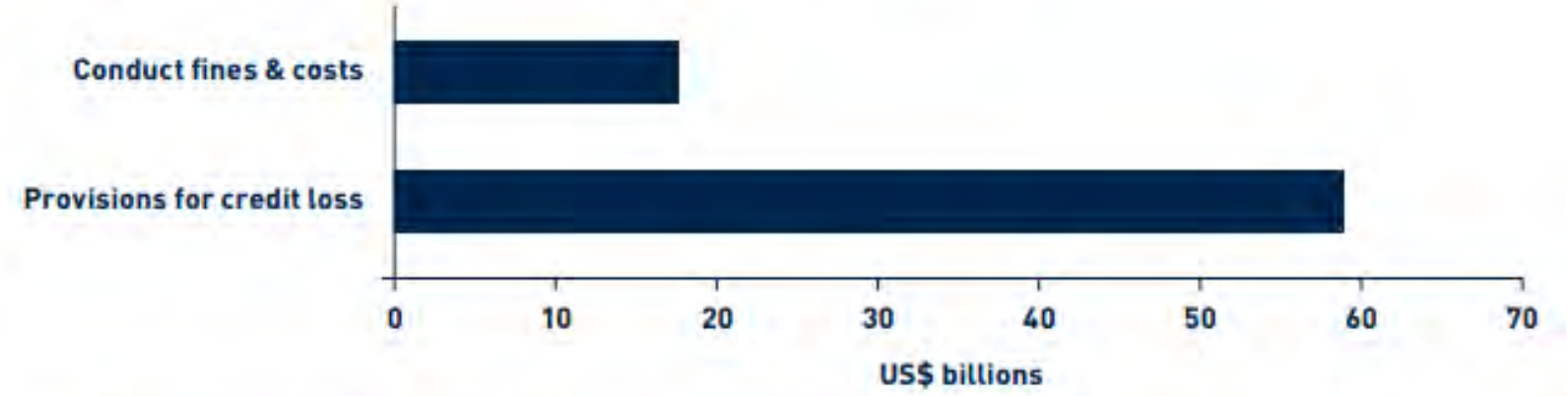
- The CRO roles have grown in prominence
  - Regulation has required CROs and risk committees
  - Responsibility for effectively managing risk within a firm
  - Role goes beyond market and credit risk; enterprise level risks
  - Reduction in risk management failures
  - Recognition of early warning signals

- Common issue identified by CROs is that their information/messages did not permeate
  - Popularity is low within financial firms
  - Influence is underweight in comparison to competing roles e.g. Chief Strategy or Marketing Officer
  - New members to the board & board committees

"Leading Ideas in Risk" Roundtable Discussions

Risk Culture and Materiality

FIGURE 3. "Average bank" conduct and credit costs, 2009–Q4 2014



SOURCES: Company annual reports; regulatory statements; global press; Oliver Wyman analysis.

- Conduct fines represent 30% of provisioned amount for credit losses by banks from 2009 – 2014

Source: Banking Conduct and Culture: A Call for Sustained and Comprehensive Reform. Group of Thirty, Washington, D.C. July 2015

Risk Function Practices and Links to Management Scholarship

- Social-cognitive theory defines three different forms of human agency [Bandura 2000].
  - Personal Agency: Capability to exert influence over one's functioning and the course of events by one's actions
  - Collective Agency: People's shared beliefs in their collective power to produce desired results
  - Proxy Agency: Recognition of lack of direct control over institutional practices thus seeking socially mediated modes of agency using proxy control of other agents representing expertise or influence
- Assimilation of the states of agency based on conditions for dominance of states

Source: Bandura, Albert. Exercise of Human Agency Through Collective Efficacy. Current Directions in Psychological Science, 9(3): 75 – 78, 2000.

Formal Structure via Organizational Charts

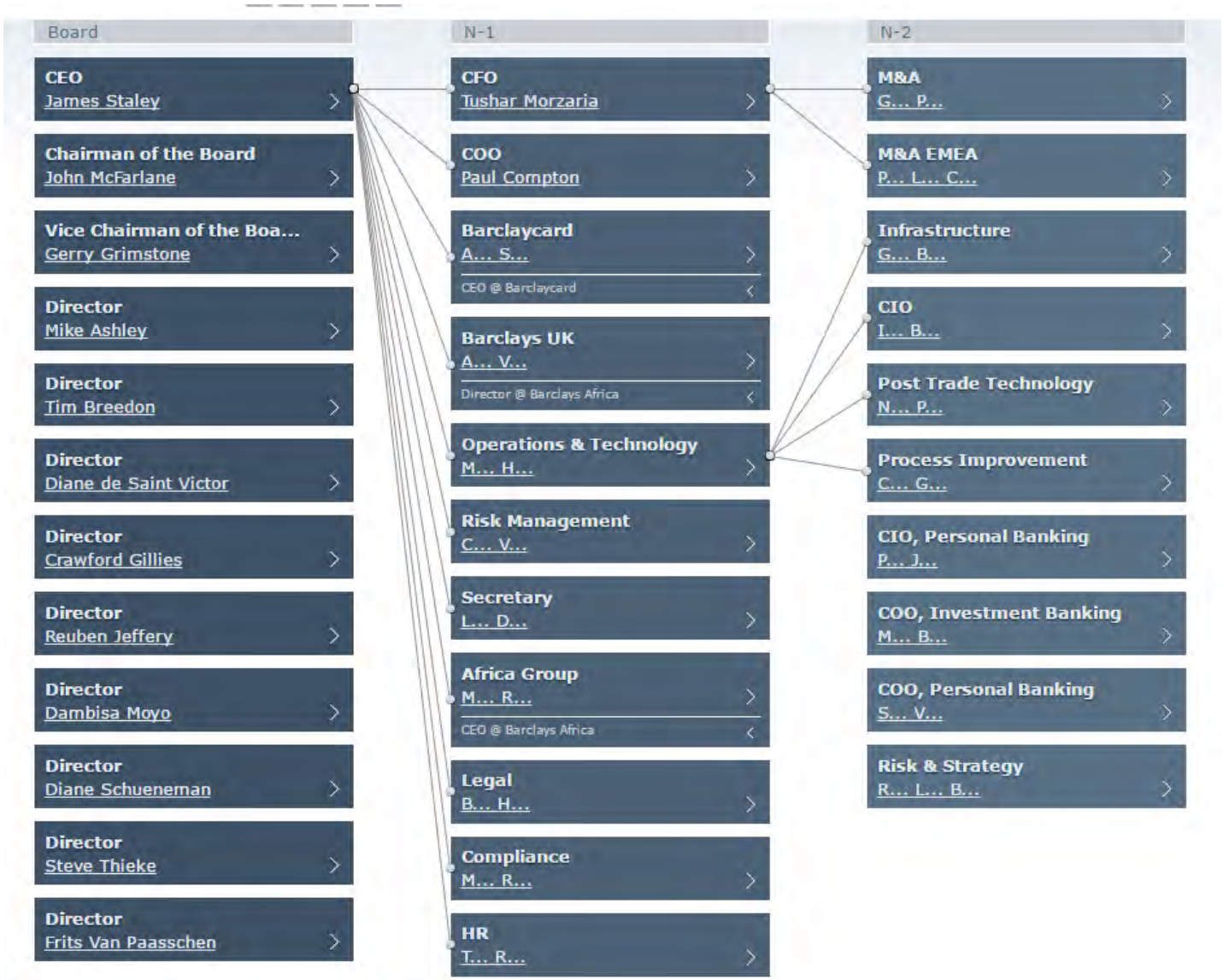


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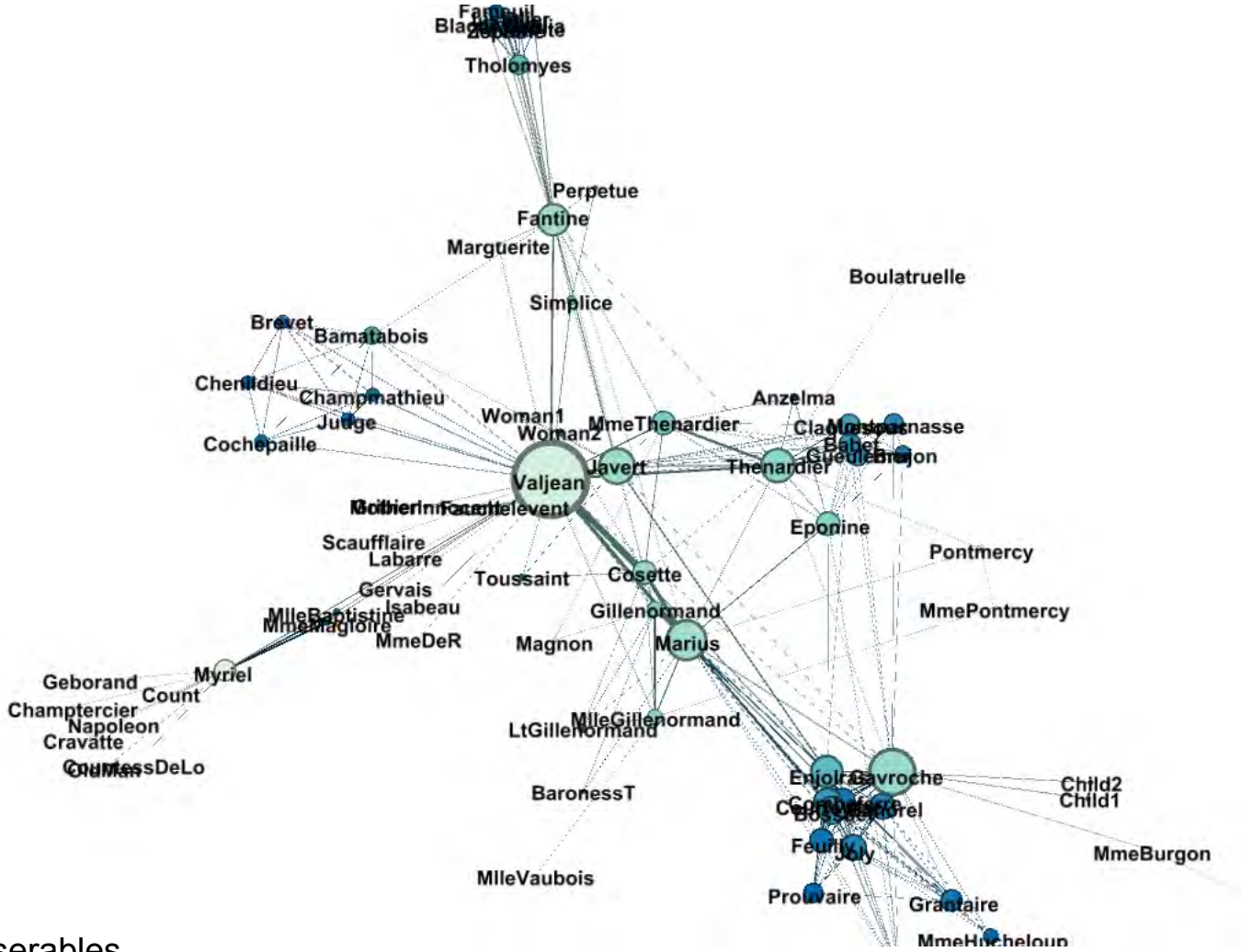
Image Source: theofficialboard.com

Social Network Diagram from Le Miserables

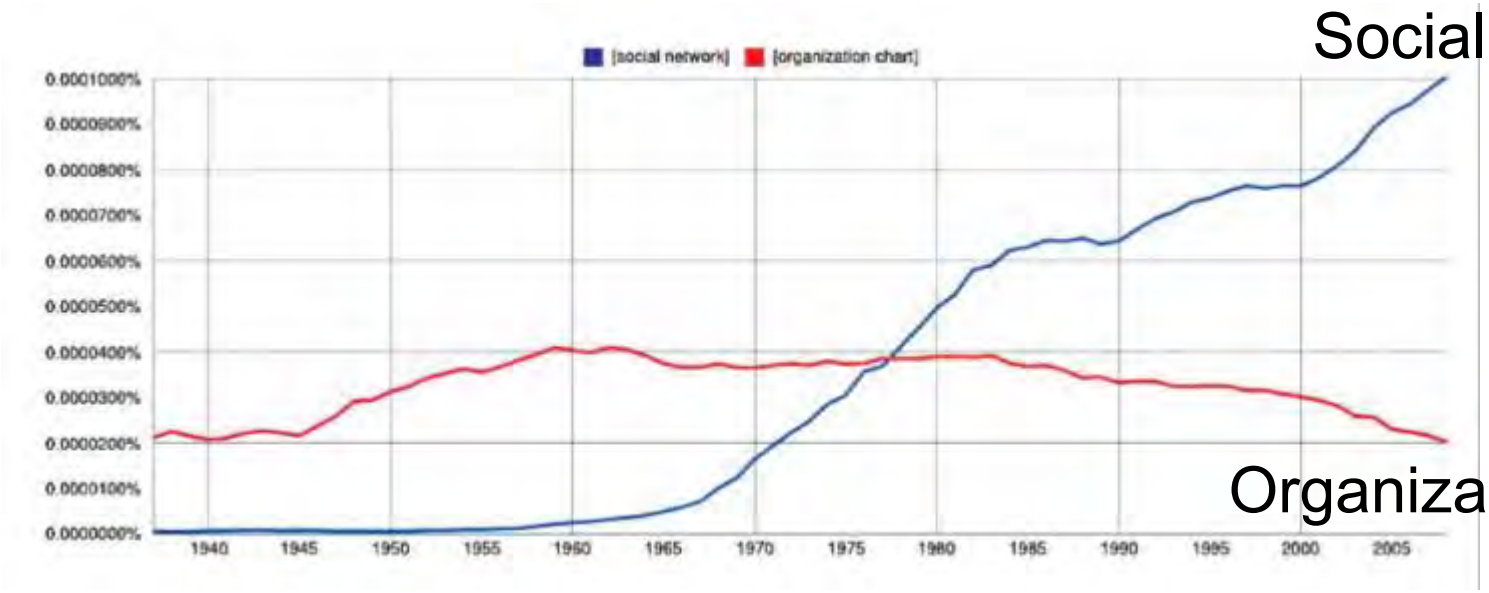
Image source: Amazon



- Victor Hugo's Les Miserables
- Coappearance weighted network of characters in the novel Les Miserables. D. E. Knuth, The Stanford GraphBase: A Platform for Combinatorial Computing, Addison-Wesley, Reading, MA (1993).

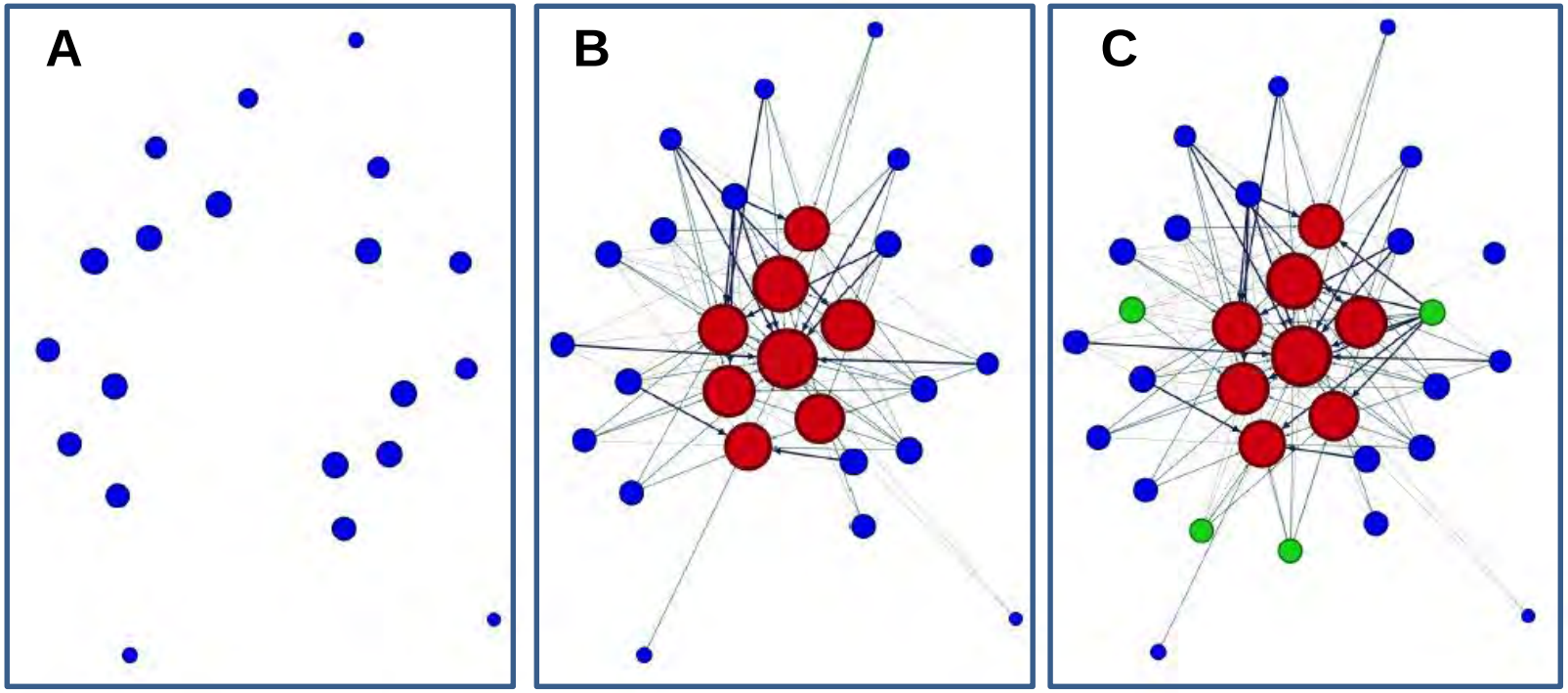
Interplay between Personal and Collective Agency

- Not so simple: the risk function in firms exist somewhere between formal and informal networks



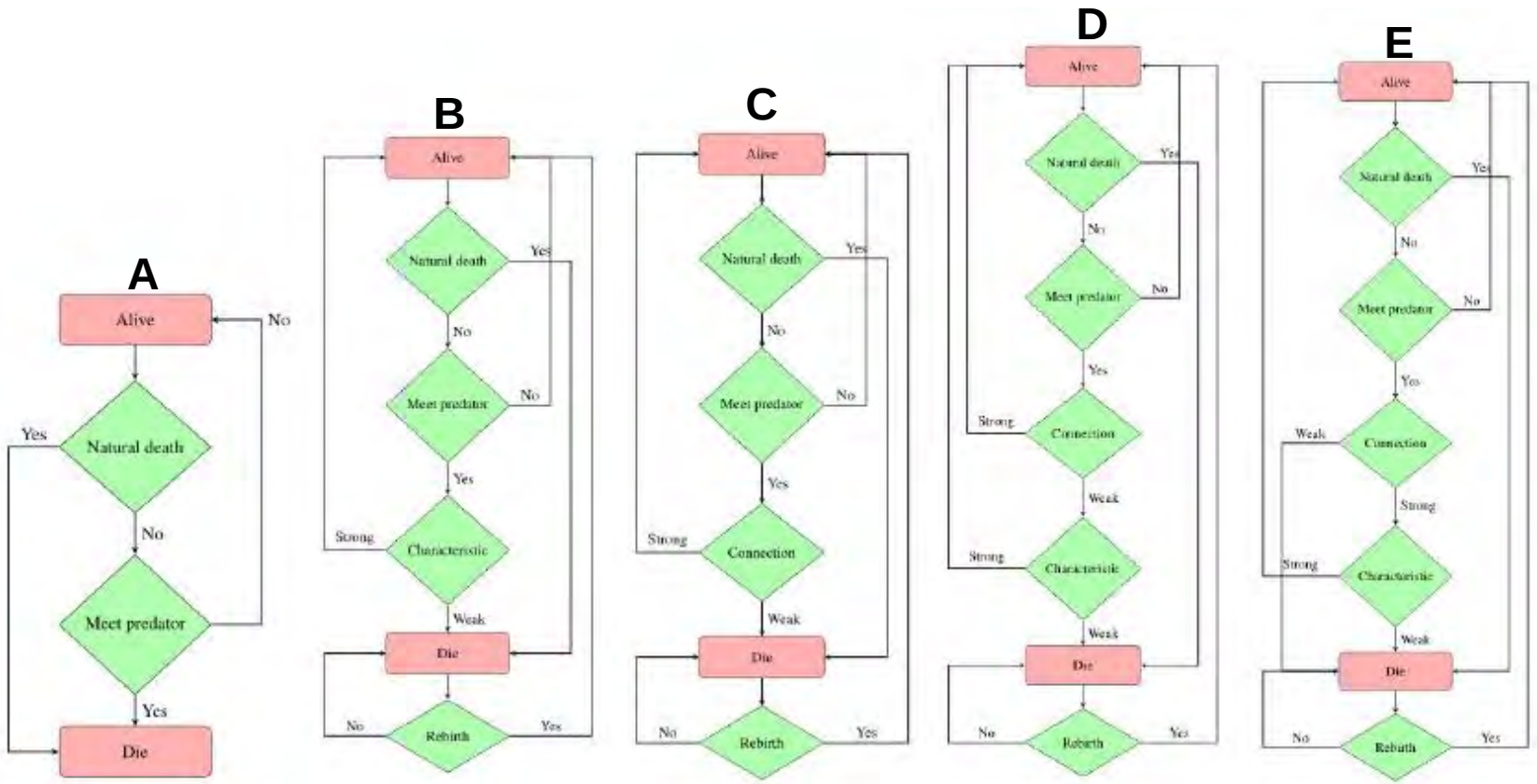
Source: McEvily, Soda, Tortoriello [2015]. Relative Frequency of Phrases “Social Network” and “Organization Chart”

Network Initialization State Diagram of Agent Based Model



Source: Cambridge Centre for Risk Studies

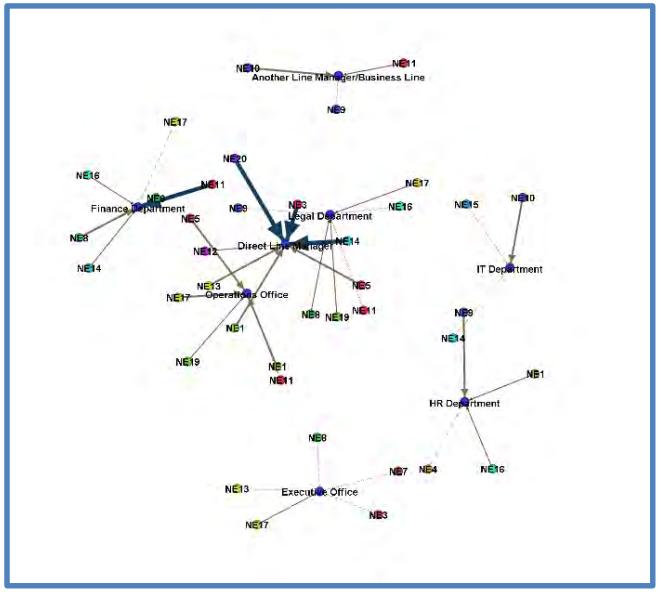
Agent-Based Simulation Design



Source: Cambridge Centre for Risk Studies

Figure 1: Illustration of 5 different agent-based models.

Simulation States : Version A



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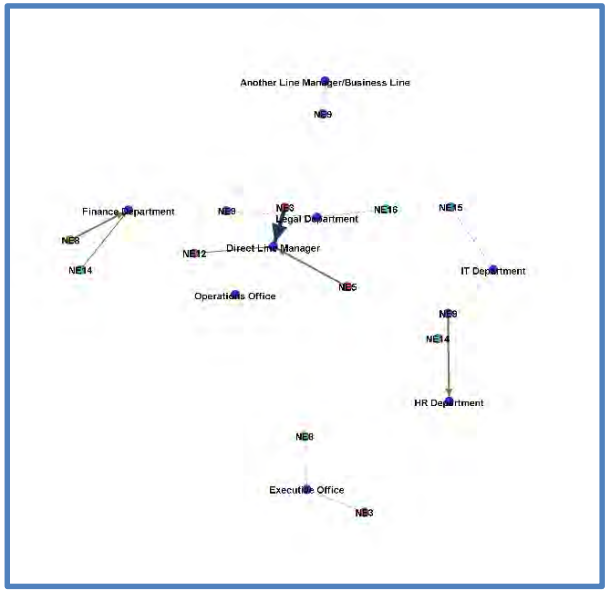

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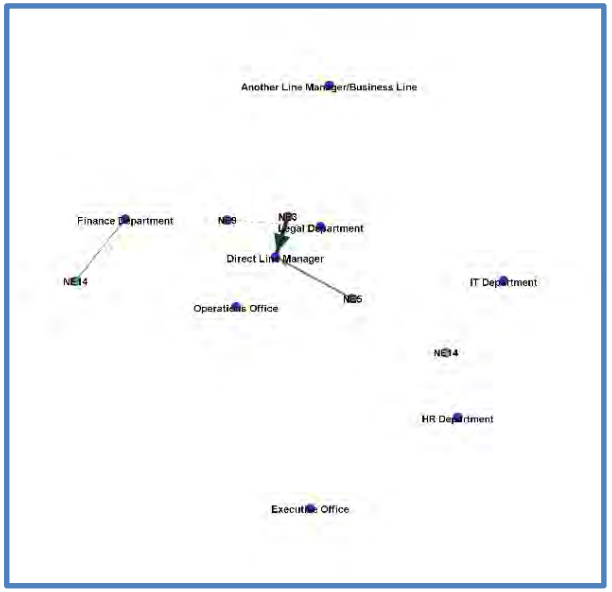

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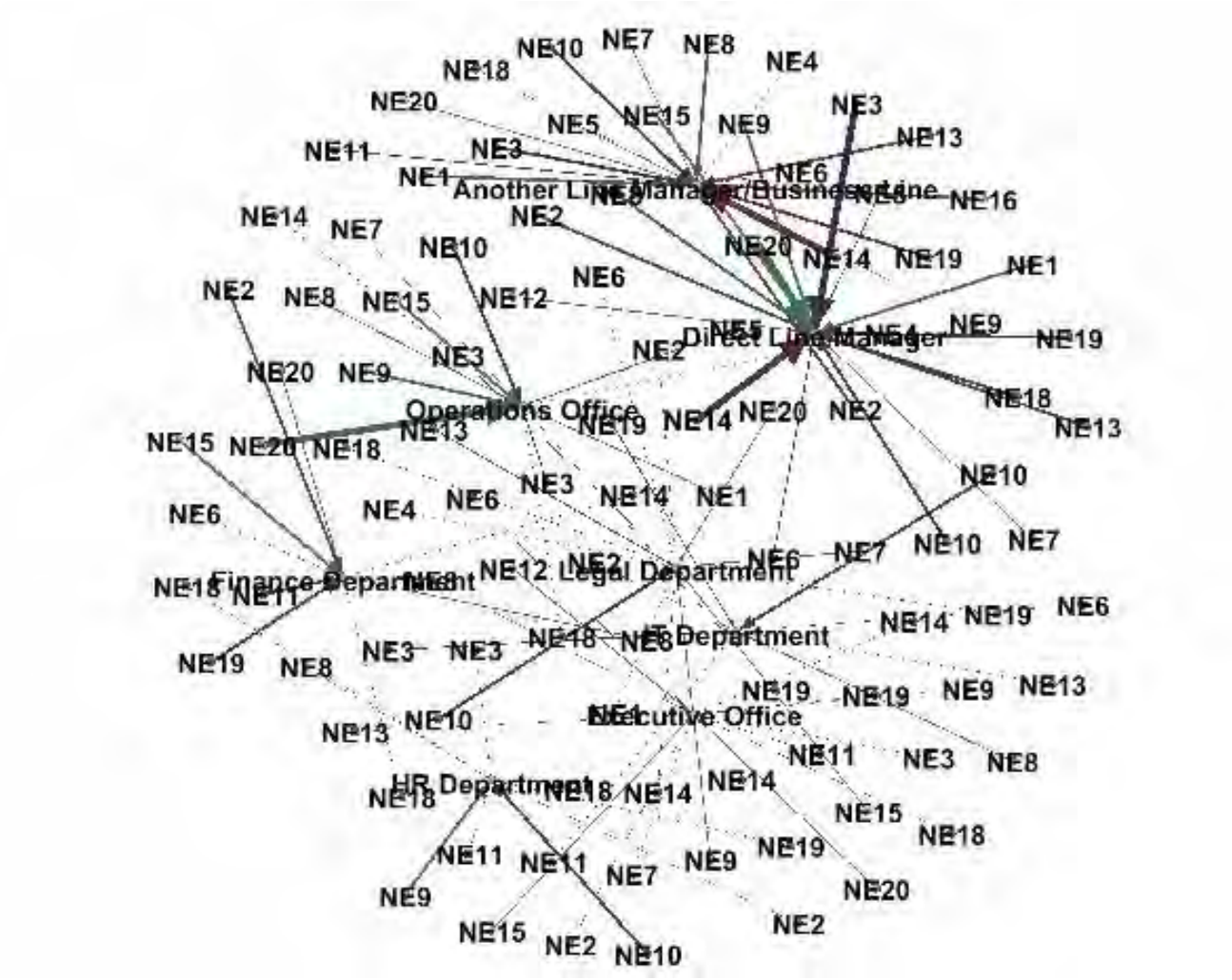
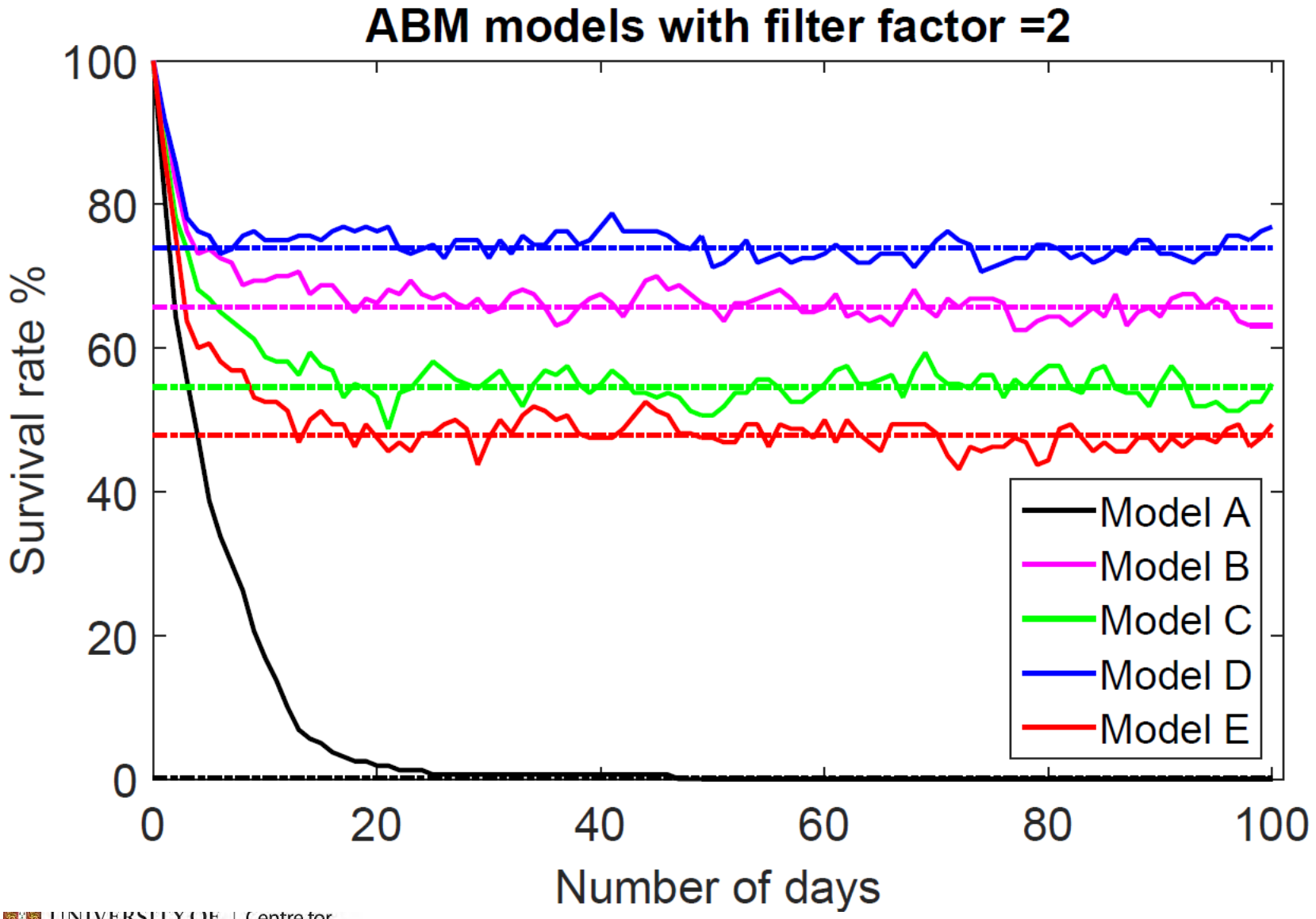
Source: Cambridge Centre for Risk Studies

Model E Simulation: Information Birth/Death with Rebirth



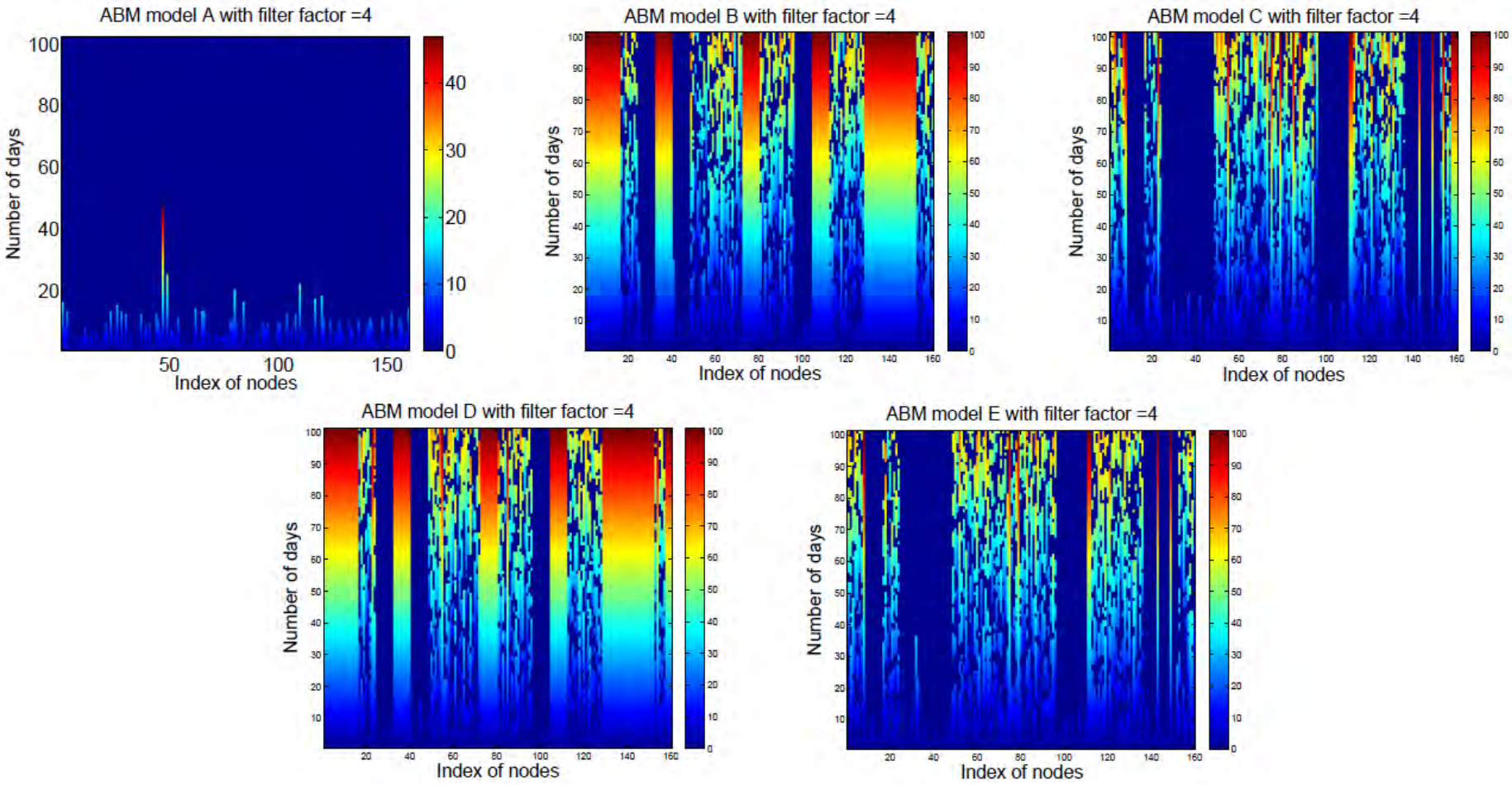
Source: Cambridge Centre for Risk Studies

Network Initialization State Diagram



Source: Cambridge Centre for Risk Studies

Accumulated Survival Record of Each Node



Source: Cambridge Centre for Risk Studies

- Not so simple: the risk function in firms exist

Future Research Design Questions

- What does a good organisation look like?
  - Shape of network
  - Information filters
  - Natural balance of signal/noise or value/volatility
- What is the value of information in a network? How long does good information last?
- Average vs variability
  - Good signals can die when averaging
- How does information play out in different types of networks: advice, friendship, influence, etc
- What positions hold the most influence in a firm? How do you assess influence?
- Do organizations consider network structures as a competitive advantage?
- Are important functions enabled through the right network actors?
- Examples of organizational structures supporting rapid transitions
  - Technology
  - Finance
  - Healthcare
  - Energy

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Model Description

- Adaptation of agent based models in ecological population dynamics. E.g. predator/prey model. [Martin, A. and Ruan, 2001]
  - Added rebirth capability
  - Added influence factors
  - Added agent connections
  - Includes time delays
- Model implemented in Matlab
- Visualisation in Gephi

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