

*Network Resilience Applied to
Financial and Monetary Systems
What Economics Should Learn from Nature*

FAS from networks to strategy
research



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Evidence for Structural Cause?

- This is the biggest, but not the first crisis:
 - 96 previous banking crises
 - 176 monetary crises
 - in recent 25 year period (World Bank)
- Financial instabilities have been with us regularly since “modern money” in 17th century

Key Points

- There is a ***structural*** cause to this financial crisis
- A ***structural solution involving complementary currencies*** is available to systemically solve this problem, for now and for the future.

Plan

- Structural Cause
- Structural Solution
- Conclusions

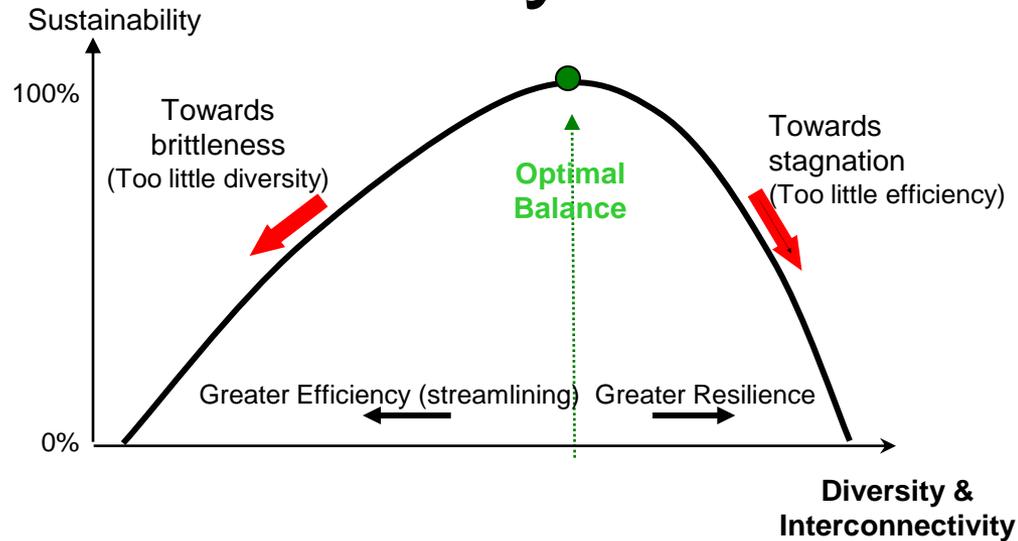
Sustainability of Complex Networks

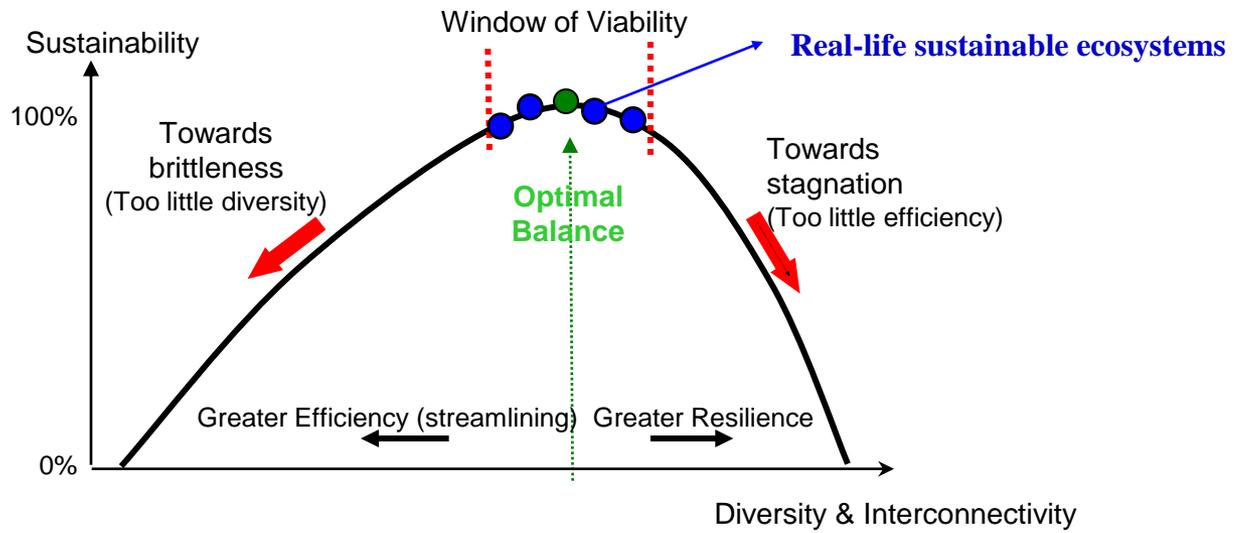
- Robert Ulanowicz *et al.* 25 years of ecosystem data => measure of sustainability of any complex network with a *single metric*.
- **Efficiency** and **Resilience** of a complex network = emergent properties from 2 **structural** variables: **diversity** and **interconnectivity**
 - Higher diversity and interconnectivity allow for higher resilience
 - Lower diversity and interconnectivity allow for higher efficiency.
- Sustainability results from appropriate balance between efficiency and resilience.

Mathematical Evidence

- Western scientific approach focuses almost exclusively on “what is”, rather than “what is not”.
 - Capacity to change of a complex network: $H = X + \psi$
where $X =$ “order” = “mutual constraint” ($H = X + \psi$) (“Yang”) and $\psi =$ “lack of order” = “conditional entropy” (“Yin”)
- Natural ecosystems are sustainable because they are close to an optimal *balance* between X as directed efficiency and ψ as flexibility to change.

Sustainability in Natural Ecosystems

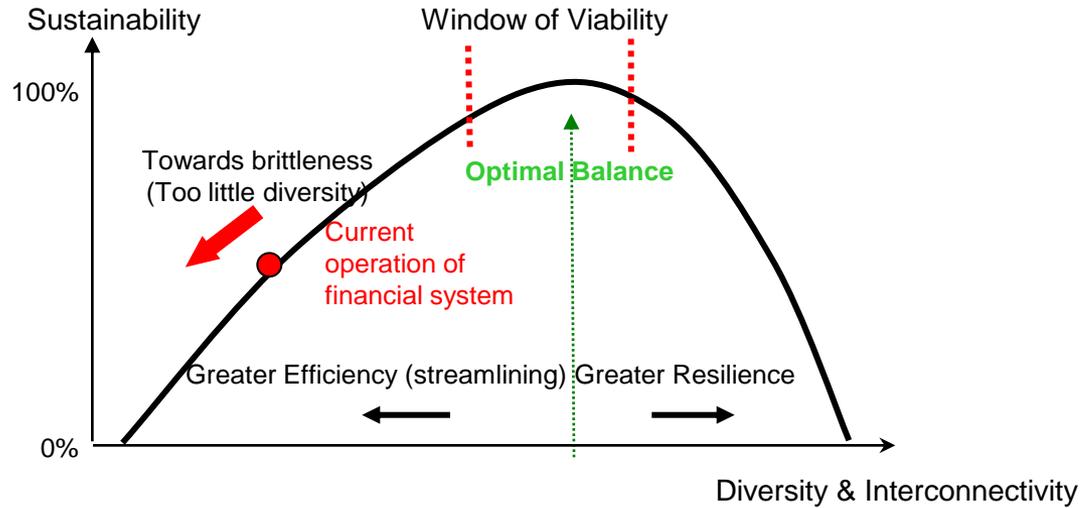


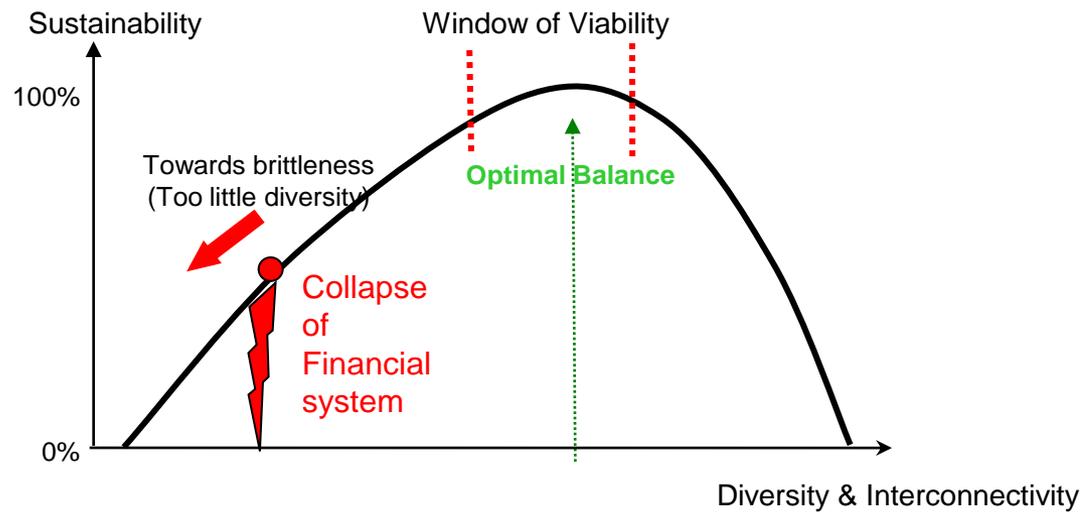


Applicability beyond Eco-systems

- Because sustainability of complex network is conditioned to its structure, any complex network of similar structure follows same rules, independently from *what* is being processed in network
 - *biomass* in an ecosystem,
 - *electrons* in electrical circuit,
 - *information* in biological immune system,
 - ***money*** in an economy...

Application to Monetary System

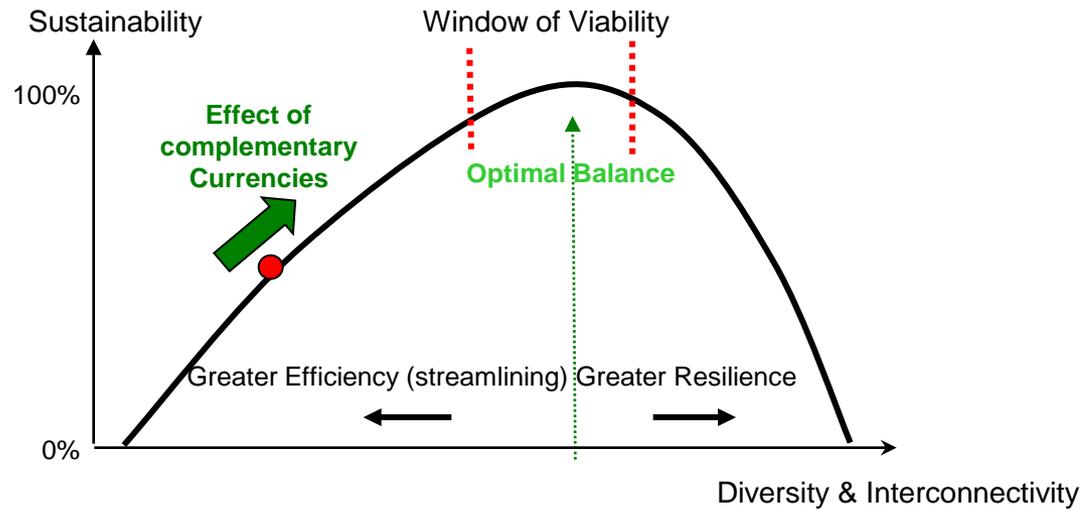




Plan

- Systemic Cause
- **Systemic Solution**
- Conclusions

Systemic Solution



Structural Solution

- Complementary currencies ***structurally*** diversify our media of exchange
- Complementary currency = a standard medium that circulates in parallel with conventional money
 - Complementary currencies link unmet needs with unused resources.
 - Complementary currencies diversify means of exchange + increase interconnectivity

Plan

- Systemic Cause
- My Proposals
- **Conclusions**

Request for Help

- Explore 5 dimensional object in 3D graphs?
(Matlab?)
- Data of a Financial/Banking flow?

Conclusions

- Orthodox doctrine: “modern money” = a monopoly of bank-debt money.
- Instabilities are attributed to everything but structure:
 - “banker’s greed” (Main Street)
 - “human nature” (Greenspan)
 - “deregulation” (Bank of England)
- What can I/we do?

Follow up

- Ulanowicz et al “Quantifying Sustainability: Resilience, Efficiency and the Return of Information Theory” (*Ecological Complexity*, 2009)
- Goerner et al “Quantifying Economic Sustainability” (*Economic Complexity*, 2009)
- Lietaer et al “Is our monetary structure a source for systemic instability: Evidence and remedies from Nature” (*Journal of Future Studies* 2010)
- www.lietaer.com
 - All Documents backing this approach
- B. Lietaer “*Future of Money*”
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