

Original Article

The uncertainty of systemic risk

Thomas Ilin^{a,*} and Liz Varga^b

^aSchool of Management, Complex Systems Research Centre, Cranfield University, Cranfield MK43 0AL, UK.

E-mail: thomas.ilin@mail.com

^bComplex Systems Research Centre, Cranfield University, Cranfield MK43 0AL, UK.

*Corresponding author.

Abstract This article responds to calls in the literature for a major shift in approaches to explaining systemic risk. It applies insights from multiple disciplines, but departs from the monistic positivist research orientations of many previous contributions by taking a carefully argued pragmatic approach from management science to address non-linear intractability. A new operational behaviour paradigm of systemic failure is summarized, in which notions from evolutionary economics and complexity science are combined with an interpretation of entropy as risk uncertainty, to explain systemic risk in terms of catastrophic bifurcations simulated in the operational state-space of an agent-based computational model representing a highly simplified global financial system. Then the key features of a recent programme of theory development research based on this approach are described, in which the results of a simulation of Iceland's financial system collapse were validated with empirical data from annual reports over that period. Findings suggested that a lack of diversity in participation strategies among system participants may have been a key operational mechanism of catastrophic tensions over supply versus demand for financial services, confirming academic commentary on that event. In conclusion, the operational definition of systemic risk proposed in this research is argued to be a practical basis on which future research may be able to construct computational solutions capable of measuring systemic risk more accurately by predicting systemic failure of the global financial system in more detailed and realistic simulations for diverse applications such as financial system regulation and cyber-warfare impact analysis.

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