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How Resilient Is Your Organization? From Local Failures to Systemic Risk

By Christos Ellinas, Neil Allan and Neil Cattle

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How Resilient is Your Organization? From Local Failures to Systemic Risk

Christos Ellinas¹²³

Neil Allan³

Neil Cattle⁴

Abstract

Empirical evidence of reported losses suggests that insurance firms are interconnected in a nontrivial way. As a result, systemic risk is a real possibility, where the failure of a single firm can have a disproportionate effect on the market by affecting firms connected to it. Systemic risk can be viewed as the result of a cascading process, as it unravels throughout a network structure. In response, this work presents a simple analytical model that can simulate this process. The model is subsequently tested upon an empirical dataset via the means of numerical simulations. Consequently, the systemic role of individual firms, both in terms of triggering a cascade or being affected by one, is established based on two novel indices: the Criticality IDX and the Sensitivity IDX. This article makes three main contributions. First, it provides a novel methodology for quantitatively and objectively assessing the systemic role of individual firms within the insurance domain. Second, it exemplifies the inability of traditional, firm-based information in serving as proxies for mapping these systemic effects. Third, it provides a practical example where network-based information (e.g., Criticality IDX, Sensitivity IDX) can outperform firm-based information (e.g., admissible assets, excess capital) resulting in increased efficiency in the decision-making process. These findings strengthen the need to account for the interconnected nature of the domain while showcasing some of the potential benefits that can be harvested by doing so.

¹ ce12183@bristol.ac.uk (corresponding author)

² Systems IDC, University of Bristol, United Kingdom

³ Systemic Consult Ltd., United Kingdom

⁴ Milliman Inc., United Kingdom