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Sebastian Poledna, Olaf Bochmann, Stefan Thurner

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Basel III capital surcharges for G-SIBs are far less effective in managing systemic risk in comparison to network-based, systemic risk-dependent financial transaction taxes

Sebastian Poledna^{a,b}, Olaf Bochmann^{d,e}, Stefan Thurner^{b,c,a,f,*}

^aIIASA, Schlossplatz 1, A-2361 Laxenburg, Austria

^bSection for Science of Complex Systems, Medical University of Vienna, Spitalgasse 23, 1090, Austria

^cSanta Fe Institute, 1399 Hyde Park Road, Santa Fe, NM 87501, USA

^dInstitute of New Economic Thinking at the Oxford Martin School, Eagle House, Walton Well Rd., Oxford OX2 3ED, UK

^eMathematical Institute, University of Oxford, Woodstock Rd., Oxford OX2 6GG; UK

^fComplexity Science Hub Vienna, Josefstädter Straße 39, 1080 Vienna, Austria

Abstract

In addition to constraining bilateral exposures of financial institutions, there exist essentially two options for future financial regulation of systemic risk: First, regulation could attempt to reduce the financial fragility of global or domestic systemically important financial institutions (G-SIBs or D-SIBs), as for instance proposed by Basel III. Second, it could focus on strengthening the financial system as a whole by reducing the probability of large-scale cascading events. This can be achieved by re-shaping the topology of financial networks. We use an agent-based model of a financial system and the real economy to study and compare the consequences of these two options. By conducting three computer experiments with the agent-based model we find that re-shaping financial networks is more effective and efficient than reducing financial fragility. Capital surcharges for G-SIBs could reduce systemic risk, but they would have to be substantially larger than those specified in the current Basel III proposal in order to have a measurable impact. This would cause a loss of efficiency.

Keywords: Basel III, Systemic Risk, Resilience, Agent-Based Modelling, Self-organisation, Network Optimisation, DebtRank, Banking regulation, Sustainability

JEL: D85, G01, G18, G21

1. Introduction

Six years after the financial crisis of 2007-2008, millions of households worldwide are still struggling to recover from the aftermath of those traumatic events. The majority of losses are indirect, such as people losing homes or jobs, and for the majority, income levels have dropped substantially. For the economy as a whole, and for households and for public budgets, the miseries of the market meltdown of 2007-2008 are not yet over. As a consequence, a consensus for the need for new financial regulation is emerging (Aikman et al., 2013). Future financial regulation should be designed to mitigate risks within the financial system as a whole, and should specifically address the issue of systemic risk (SR).

SR is the risk that the financial system as a whole, or a large fraction thereof, can no longer perform its function as a credit provider, and as a result collapses. In a narrow sense, it is the notion of contagion or impact from the failure of a financial institution or group of institutions on the financial system and the wider economy (De Bandt and Hartmann, 2000; Bank for International Settlements, 2010). Generally, it emerges through

one of two mechanisms, either through interconnectedness or through the synchronization of behavior of agents (fire sales, margin calls, herding). The latter can be measured by a potential capital shortfall during periods of synchronized behavior where many institutions are simultaneously distressed (Adrian and Brunnermeier, 2011; Acharya et al., 2012; Brownlees and Engle, 2012; Huang et al., 2012). Measures for a potential capital shortfall are closely related to the leverage of financial institutions (Acharya et al., 2012; Brownlees and Engle, 2012). Interconnectedness is a consequence of the network nature of financial claims and liabilities (Eisenberg and Noe, 2001). Several studies indicate that financial network measures could potentially serve as early warning indicators for crises (Caballero, 2012; Billio et al., 2012; Minoiu et al., 2013).

In addition to constraining the (potentially harmful) bilateral exposures of financial institutions, there are essentially two options for future financial regulation to address the problem (Haldane and May, 2011; Markose et al., 2012): First, financial regulation could attempt to reduce the financial fragility of “super-spreaders” or *systemically important financial institutions* (SIFIs), i.e. limiting a potential capital shortfall. This can be achieved by reducing the leverage or increasing the capital requirements for SIFIs. “Super-spreaders” are institutions that are either too big, too connected or otherwise too important to fail. However, a reduction of leverage simultaneously reduces

*Corresponding author

Email addresses: poledna@iiasa.ac.at (Sebastian Poledna),
olaf.bochmann@inet.ox.ac.uk (Olaf Bochmann),
stefan.thurner@meduniwien.ac.at (Stefan Thurner)

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