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DebtRank a centrality measure for financial systems and beyond GUIDO CALDARELLI, IMT Alti Studi Lucca, STEFANO BATTISTON, MICHELANGELO PULIGA, RAHUL KAUSHIK, PAOLO TASCA, Chair of System Design ETH Zurich, CHAIR OF SYSTEM DESIGN COLLABORATION, IMT ALTI STUDI LUCCA COLLABORATION — Use of network theory made possible to measure quantitatively many features of social and technological systems. In this spirit, inspired by traditional measures of centrality we introduce DebtRank a novel measure of systemic impact. We that we intend the risk of default of a large portion of the financial system, depends on the network of financial exposures among institutions. As an application, we analyse a new and unique dataset on the USD 1.2 trillion FED emergency loans program to global financial institutions during 2008–2010. We find that a group of 22 institutions, which received most of the funds, form a strongly connected graph where each of the nodes becomes systemically important at the peak of the crisis. Moreover, a systemic default could have been triggered even by small dispersed shocks. Other application to different systems are also presented.

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