The Lehman Brothers Effect and Bankruptcy Cascades

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Inspired by the bankruptcy of Lehman Brothers and its consequences on the global financial system, we develop a simple model in which the Lehman default event is quantified as having an almost immediate effect in worsening the credit worthiness of all financial institutions in the economic network. In our stylized description, all properties of a given firm are captured by its effective credit rating, which follows a simple dynamics of co-evolution with the credit ratings of the other firms in our economic network. The existence of a global phase transition explains the large susceptibility of the system to negative shocks. We show that bailing out the first few defaulting firms does not solve the problem, but does have the effect of alleviating considerably the global shock, as measured by the fraction of firms that are not defaulting as a consequence. This beneficial effect is the counterpart of the large vulnerability of the system of coupled firms, which are both the direct consequences of the collective self-organized endogenous behaviors of the credit ratings of the firms in our economic network.

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