Since the financial crisis in 2007-2008, systemic risk in a financial network has become a major concern in financial engineering and economics. In this talk, we study the vulnerability of a financial network based on the linear optimization model introduced by Eisenberg and Noe (2001), where the right hand side of the constraints is subject to market shock and only partial information regarding the liability matrix is revealed. We conduct a new sensitivity analysis to characterize the conditions under which a single bank is solvent, default or bankrupted, and estimate the probability that some financial institute in the network will be bankrupted under mild assumptions on the market shock and the network structure. We also show that the asset inequalities among the banks have a negative impact on the efficiency and stability of the network, and demonstrate that the bailout of big banks may not stop the domino effect regarding the bankruptcy in a network with a ring structure dominated by a monopoly, which is also the most vulnerable network.