1121-49-246 **Weijie Pang*** (wpang@wpi.edu), **Zachary Feinstein** (zfeinstein@wustl.edu), **Birgit Rudloff** (brudloff@wu.ac.at), **Eric Schaanning** (eschaanning@gmail.com), **Stephan Sturm** (ssturm@wpi.edu) and **Mackenzie Wildman** (mackenzie.wildman@gmail.com). *Sensitivity of the Eisenberg-Noe Network Model to the Relative Liabilities.*

The financial system is increasingly interconnected. Cyclical interdependences among corporations may cause that the default of one firm seriously affects other firms and even the whole financial network, as illustrated the default of Lehman Brothers during the 2008 financial crisis. To describe financial networks, L. Eisenberg and T. Noe introduced network models that became popular among researchers and practitioners. To describe the connections between firms, they use the liabilities between two firms to construct relative liability matrices. Based on this description, they compute the payouts of firms to their counterparties. However, in practice, there is no accurate record of the liabilities and researchers have to resort to estimation processes. Thus it is very important to understand possible errors of payouts due to the estimation errors. In our research, we describe estimation errors via sizes and directions of perturbations in the relative liability matrices. We quantify the effect of estimation errors to payouts using directional directives and derive the formula $D_B(p(A)) = (I - \Lambda A^T)^{-1}\Lambda B^T p(A)$ in the regular financial network. For a given estimation error size, we compute the effect to the payout along the worst estimation error. (Received July 19, 2016)