I provide simulation evidence that the complex systems framework is well-suited for explaining the historical distribution of U.S. commercial bank failure cascades. I use the complex systems framework to test a model of the efficacy of microprudential (bank-level) ratio-based capital adequacy regulations, and find that these requirements generally have the adverse effect of increasing the likelihood of large failure cascades. This adverse effect is especially pronounced under simulation conditions that mimic economic downturns. If banks use more leverage in response to decreased capital adequacy requirements, the likelihood of failure cascades increases only minimally. These results suggest that existing capital adequacy requirements might be counterproductive to the goal of mitigating bank failure cascades.