

THESIS DEFENSE

TESTING NETWORK CENTRALITY FOR ECONOMIC POWER MEASUREMENT: STRUCTURE AND BOUNDARIES IN U.S. INTERSTATE TRADE

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Defense Details

Date: 16-Apr-2026

Time: 12:00 PM – 1:30 PM ET

Thesis Committee

Dr. Cliff Joslyn, Advisor

Dr. Carlos Gershenson-Garcia, Committee Chair

Dr. Sadamori Kojaku, Committee Member

Venue / Zoom:

<https://binghamton.zoom.us/j/97854264249?pwd=v9E6nlj82nnBACFn7b3alAkehDa6r1.1>

ABSTRACT

We test network centrality as an approach to measure structural power held by states in the context of the U.S. Federalist system. Using three centrality measures (betweenness, eigenvector, and out-degree) we analyze the 51-node domestic and 52-node international U.S. interstate commodity trade networks. All three measures demonstrate perfect rank stability under graph filtration, validating the framework for dense networks when proper weight treatment is applied.

We find that ~40% of states diverge by five or more rank positions between GDP and network centrality, suggesting structural position captures dimensions of interstate importance that aggregate output measures miss. Additionally, we find that international boundary specification produces substantial effects: betweenness shows high sensitivity ($\rho = 0.816$) when international flows are added, while eigenvector ($\rho = 0.982$) and out-degree ($\rho = 0.994$) remain stable. We conclude with a discussion and the identification of promising future research opportunities for developing broader measures of structural state power based on the limitations of this research that was focused narrowly on commodity trade networks.