

Multiplex Networks in International Trade



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Problem :

Combining methods in data science, statistics/econometrics and economics to analyse:

1. the evolution of large, multilayer domestic and trade networks of firms,
2. study their consequences for economic outcomes focusing on one of the largest economies on the globe.

Solution:

Use firm-level accounting data and transaction-level customs data from NBS China to:

1. portrait firms' complex, multilayer domestic and trade networks and their evolution,
2. analyse key drivers of static and dynamic dimensions of these networks,
3. analyse effects of shock on network as well as its mediated effects of economic outcomes.

Impact:

Advance probabilistic machine learning methods for network analysis and statistical/econometric methods in data with endogenous network structure.

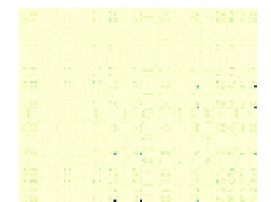
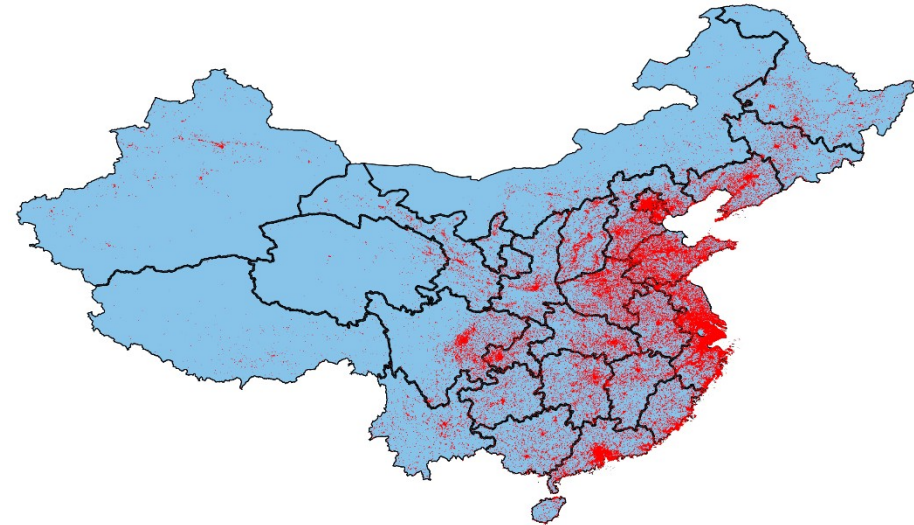


Figure 3: Weight Matrix Based on Euclidean Distance of Firms



Figure 4: Weight Matrix Based on Technological Distance of Firms

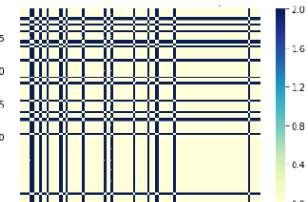


Figure 5: Firm-to-firm Distance Calculated by PCA

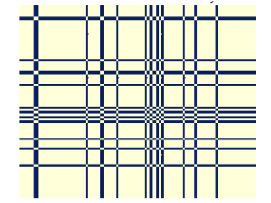


Figure 6: Firm-to-firm Distance Calculated by SDNE

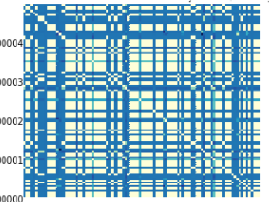


Figure 7: Firm-to-firm Distance Calculated by LANE (training)

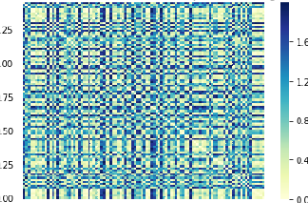


Figure 8: Firm-to-firm Distance Calculated by LANE (testing)