Chapter 3

An Empirical Model of Buyer-Supplier Matching in Dynamic Trade Networks

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Abstract

Employing a stochastic actor-oriented model for network dynamics, we study buyer-supplier matching within and across countries of the OECD. Our model approaches these dynamics from the perspective of individual nodes and thus enables us to identify the driving forces behind the formation of trade relationships. Compared to more standard econometric techniques, one major advantage of the actor-oriented model is that it resolves the endogeneity problem in dynamic trade networks that arises when structural network characteristics determine the formation of ties. Extending this framework to the multiplex dynamics of co-evolving one-mode and two-mode networks, we do not only model the formation of trade relationships between OECD countries in the one-mode network but also their affinity to import from and export to non-OECD economies via the consideration of two additional two-mode networks. The empirical value of our approach is demonstrated by fitting the model to data from the OECD Inter-Country Input-Output Tables. Building on this approach, we find that geography, supplier heterogeneity in terms of productivity, labor costs, output share, and economic complexity, trade frictions and costs of trade, as well as technological similarities and complementarities determine the formation of trade relationships. At the same time, the analysis also shows that trade relationships across OECD countries are strongly related to the countries' import and export activities in the two bipartite networks.