

Paradigmatic Qualities of Network Theory

Jon Johnson

Walton College Professor of Sustainability

Sam M. Walton College of Business

University of Arkansas

Supply Chain → Supply Network

- Ask managers which networks matter most to their firm
- Not a new insight...

“Here, the value tree analogy may be helpful. It would be rare for a firm to participate in only one supply chain. For most manufacturers, the supply chain **looks less like a pipeline or chain than an uprooted tree**. The question is how many of these branches and roots need to be managed.”

-Cooper, Lampert & Pagh, 1997: 9

After that, it goes to still another cluster and on and on until it reaches the end user. The result is a supply chain that looks like **beads on a rosary or cities on a map** connected by interstates... The problem with a small-world network is that for most products, any chain link model is *probably too simplistic*. As Cooper et al. (1997, p. 9) note, "for most manufacturing, the supply chain looks less like a pipeline or chain than an uprooted tree.”

-Galaskiewicz, 2011: 6

“Whereas supply chain research has emphasized the buyer–supplier dyad, *supply network research strives to **examine the network beyond the dyad***, from triads to the extended network.”

-Choi & Dooley, 2009: 25

We do not have a particularly good sense of the topology of supply networks in the real world.

Network Theory as Paradigm?

“In the course of time, structural analysis has emerged as a distinctive form of social inquiry having **five paradigmatic characteristics** that provide its underlying intellectual unity:

-Wellman, 1988: 20

Structural Determinants

“Behavior is interpreted in terms of **structural constraints** on activity, rather than in terms of inner forces within units (e.g., ‘socialization to norms’) that impel behavior in a voluntaristic, sometimes teleological, push toward a desired goal.”

- Supply chain actors are motivated by both economic and social considerations (Granovetter, 1984)
- The network a firm is embedded in constrains *and enables*
 - Increasingly seen as a source of competitive advantage
 - Important supplement to managerial choice, strategic resources, etc.

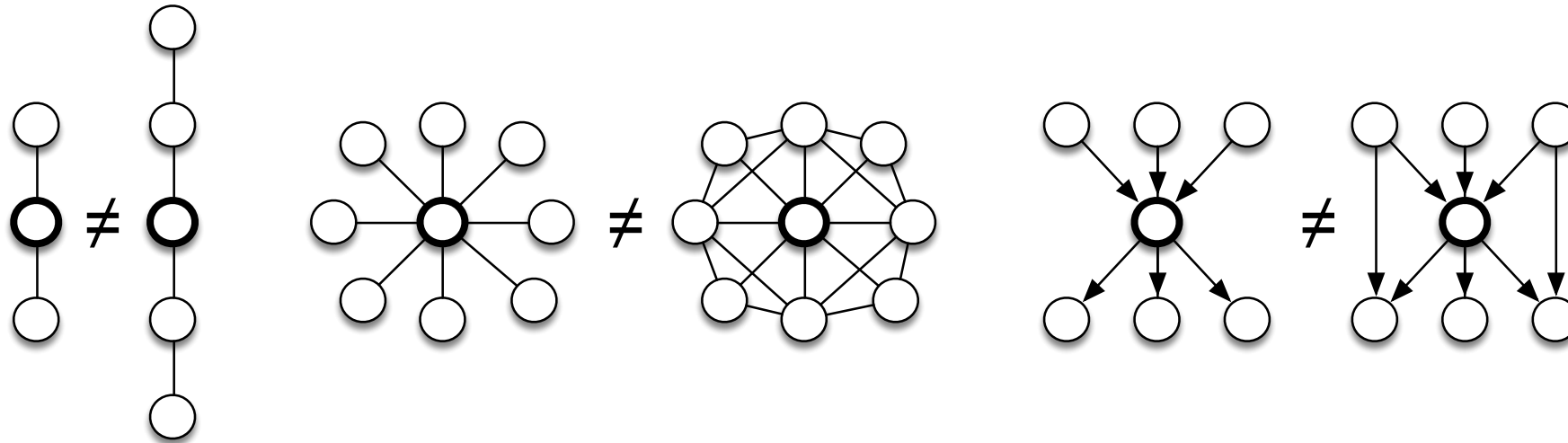
Relationships, Not Categories

“Analyses **focus on the relations between units**, instead of trying to sort units into categories defined by the inner attributes (or essences) of these units.”

- Categories are often determined by structure rather than attributes (e.g., industry, competitors, jobs)
- Network theory sometimes provides more descriptive methods for identifying groups and structural positions than *a priori* attributes

Holistic

“A central consideration is how the **patterned relationships among multiple alters jointly affect** network members' behavior. Hence, it is not assumed that network members engage only in multiple duets with separate alters.”

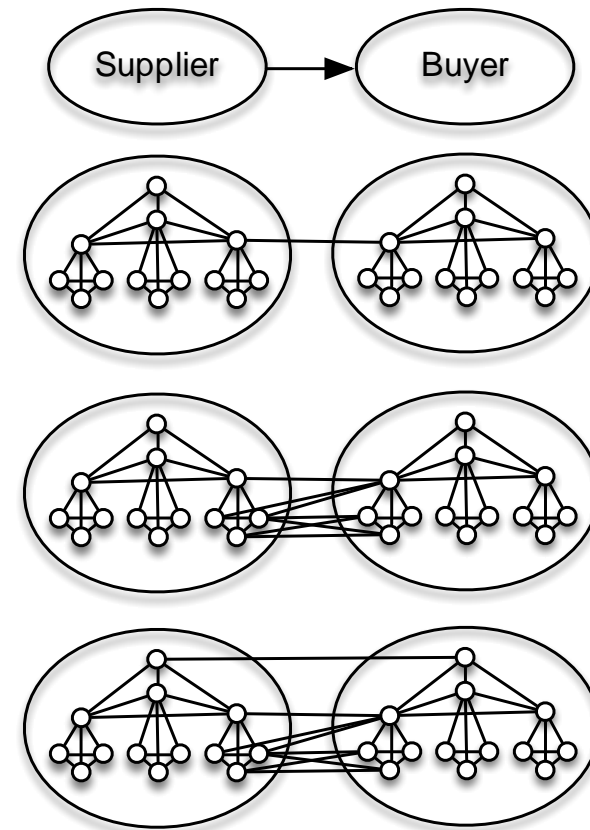


- Implications for TCE?

Network of Networks

“Structure is treated as a **network of networks** that may or may not be partitioned into discrete groups. It is not assumed *a priori* that tightly bounded groups are, intrinsically, the building blocks of the structure.”

- Clusters of actors can be collapsed and expanded into nodes and groups depending on context
- Network theory bridges between levels of analysis in creative ways



Dependence is the Point

“Analytic methods deal directly with the patterned, relational nature of social structure in order to **supplement—and sometimes supplant—mainstream statistical methods** that demand independent units of analysis.”

- Many network methods provide a means to model the dependencies typical statistical approaches assume away.

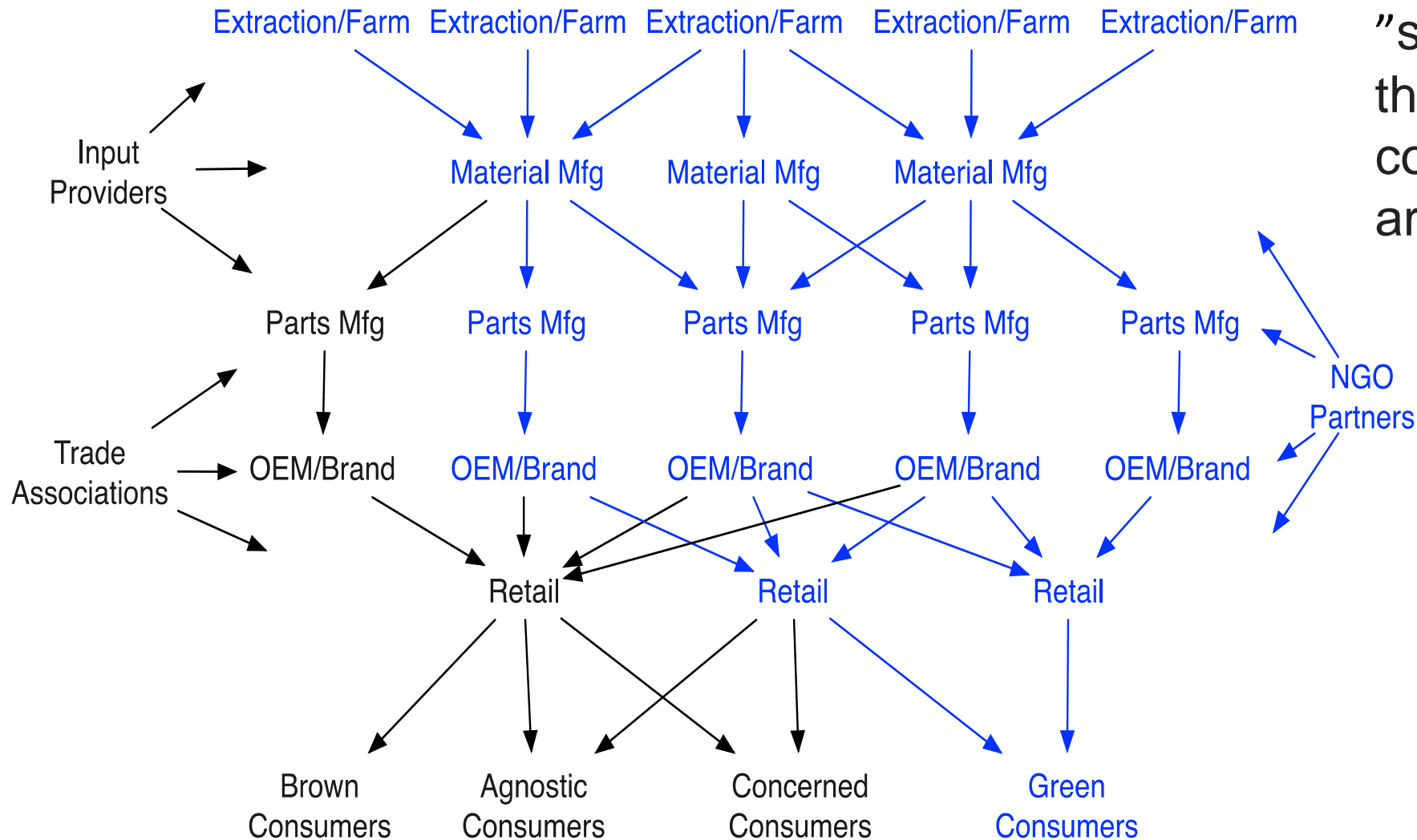
And One More Thing

“Yet close inspection by our theoretical confreres in law and economics reveals **most organizations to be mere legal fictions** with no “inside” or “outside” analogous to borders—they are **simply dense spots in networks** of contracts among sovereign individuals... With corporations, there is no there there—they are simply legal devices with useful properties for raising finance.”

-Davis & Marquis, 2005: 332

- “Supply network theory is organizational theory for the 21st century.”
 - Johnson, March 29, 2019
- Questions of boundaries, governance, strategy, performance, and even accountability are increasingly at the supply network level

Supply Network Revisited



Supply Networks as
Organizational Fields,
"sets of organizations
that, in the aggregate,
constitute a recognized
area of institutional life."
-DiMaggio & Powell, 1983