

Network Bottlenecks and Market Power

by Carvalho, Elliott and Spray

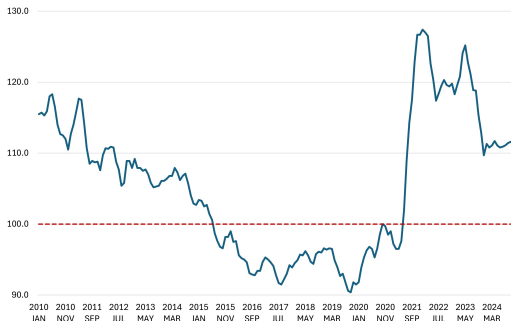
Workshop on Market Power in Supply Chains

Discussed by Joel Kariel

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Context

- Real-world bottlenecks in supply chains are hugely important.
- Evidence that shocks propagate through supply chains (Carvalho et al., 2021), but may be attenuated by substitution (Bachmann et al., 2024).
- *Pandemic*: semiconductor shortage (few key manufacturers in Taiwan, South Korea) → significant impact on auto sector.



Competition and supply chains

- Market power varies through supply chains in the traditional sense (e.g., price markups, concentration).
- How important are **pivotal firms and sectors** in supply network?
 - How does horizontal (lack of) competition propagate vertically?
 - Should competition authorities care about *both* markups and how critical the firm/sector is in the network? (Grassi, 2017)

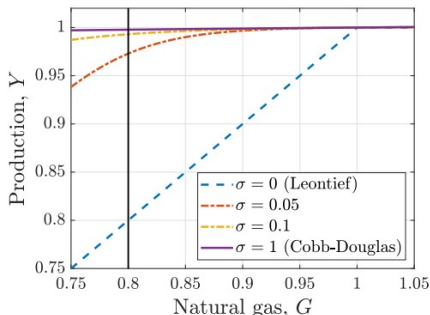
This paper

1. **Defines bottlenecks:** removal prevents supply meeting consumer demand.
2. Relates market power to the existence of bottlenecks – the economy is competitive if no firm is a bottleneck.
3. Shows that not all firms $P > MC$ are bottleneck firms. Market power spills over!
4. Uses clever approaches to **detect bottlenecks:** prune network; clustering; estimate capacities.
5. **Estimates bottlenecks:** just 1 in 750 firms, pretty persistent, correlated with 'low dynamism' variables.

Some comments! I

1. Is Leontief the right production technology as a baseline? Bachmann et al., 2024 show even very small substitution (e.g., $\sigma = 0.04$) leads to much lower output losses relative to Leontief ($\sigma = 0$).

Figure: Bachmann et al., 2024



Some comments! II

2. Node (firm) and edge (flow) capacities fixed – dynamic concerns may not matter in the short-term (e.g., immediate response to a shock).
3. Bottleneck-ness is not random: at least partially due to strategic choices.
4. **DAG restriction:** t-shirts not used to make cotton. But...
 - By-products: whey \rightarrow animal feed \rightarrow cheese \rightarrow whey.
 - Recycling/re-use: plastic bottles to make new products; water continuously re-treated.

Open questions

- What is the relationship between market power and position in supply networks? Are markups and centrality related? How do shocks propagate through supply chains, and does market power amplify or dampen them?

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- Great questions. We are working on it!