

Supply Chain Resilience: Evidence from Indian Firms^a

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^aThe views and opinions expressed are those of the authors alone and do not necessarily reflect those of the Central Bank of Chile.

- Very exciting empirical study on the resilience of supply chains
 - A critical theme in an increasingly fragmented global economy
 - Even more important given recent return to protectionism and global shocks
 - Paper contributes by providing new evidence on this theme in the context of the pandemic in India
 - Particularly useful given the rise of production network models
- Small confession: This is a paper I would have loved to have written!
 - It is also very clear and nicely written, they are very gentle with the reader
- Will focus my attention on three comments:
 - I. Supply chain resilience definition: Links versus Chains
 - II. Dynamics of firm-to-firm relationships
 - III. Cost and benefit analysis of supply chain resilience and policy implications

I. Supply Chain Resilience Definition: Links versus Chains

- Paper reports facts on firm-to-firm dynamics but refers to supply chain dynamics
 - Do they document resilience of supply chains or of specific firm-to-firm relationships?
- Would be nice to connect empirically firm-to-firm resilience with supply chain resilience
 - Firm-to-firm fluctuations do not imply necessarily supply chain fluctuations
 - Eg, does a link destruction affect the quantity/quality/price of the product to the final consumer?
 - Eg, authors find that thicker markets are less resilient because they break more links
 - Alternative interpretation: Those supply chains are more resilient \Rightarrow Irrelevance of link destruction
- Relates to the question of whether the identity of the supplier matters for the final customer
- One potential alternative definition and goal: Supply chain resilience is the capacity of the supply chain to accommodate shocks to specific relationships without disrupting final consumption
 - Facts reported by authors are definitely necessary to characterize this, but I argue that not sufficient
- Authors seem to have the ingredients to address this, at least partially with chains within the state
 - Or maybe do the same exercise with data of another country that has the entire production network :)

II. Dynamics of Firm-to-Firm Relationships

- One of the most striking findings: 77% of input reduction accounted for by extensive margin
- Does this mean that relationships are very flexible and adjust costlessly?
 - Is it cheaper to create and destroy contracts, rather than adjusting pre-existing contracts?
- Not necessarily, for several reasons
 - Total sales do go down, but how much is it due to extensive margin adjustment?
 - Maybe these separations are transitory or they do not imply contract destruction
 - How long are the separations? What is the likelihood of returning to a destroyed link?
 - Or maybe they respond by managing inventories differently, but the contract is not destroyed
 - There is something in the appendix, but could exploit more the evolution of firm-to-firm links
- In general it is a bit puzzling that effects are persistence, whereas the shock is transitory
 - Can the authors rule out mechanisms such as creative destruction of linkages?
- These are questions that the authors could answer, given the data and research design
 - And answering these questions is important to actually assess the resilience of the supply chain

III. Costs and Benefits of Supply Chain Resilience and Policy Implications

- Common policy debate these days: Should policy subsidize supply chain resilience?
- General logic: These relationships involve investment, the benefit of those investments are not privately internalized due to externalities on other firms
 - Eg, through congestion and agglomeration mechanisms that are not properly priced
- To evaluate such a policy, need to know costs and benefits of resilience
 - I do not suggest that authors do this directly, but provide/organize facts around this idea
 - In general, having a tighter mapping of the facts to a model would help in organizing ideas
- As comment I: Does the shock to a buyer's suppliers affect buyers down/up the supply chain?
 - Relatedly, does the adjustment of the extensive margin change sales downstream?
 - Doing this is not straightforward because spillovers contaminate the research design
- Some heterogeneity analysis suggest that firms might already internalize the benefits of resilience?
 - Result: More complex supply chains are more resilient to the shock
 - Exploit more heterogeneity along dimensions that capture the policy debate

III. Costs and Benefits of Supply Chain Resilience and Policy Implications (ct'd)

- Assess relevance of relationship investment: Positive vs negative, small vs large lockdown shock
 - Relevant variation in dynamic models with inaction regions due to investment and adjustment costs
- Positive versus negative
 - Analysis mostly exploits entry into lockdowns, can you exploit the end of lockdowns?
 - This will inform whether it is easier to expand, than to contract
 - It will also inform whether the dynamic effects are relevant, related to the stickiness of the links
- Small versus large
 - Can you exploit heterogeneity of the severity of the lockdown by using the Google mobility data?
 - This will inform whether fixed costs and entry costs into relationships are relevant

Less Relevant Comments

- Could include sector-district-year fixed effects to the specifications?
- Why not use unit values as an outcome and to estimate productivity, quality, markups, etc?
- I missed whether the authors show how much of intermediate input trade is missed by using only within state firm-to-firm trade
- Can they show whether informality is a relevant margin of adjustment? Do firms start trading with informal firms to reduce costs?
- The authors focus on net and not gross dynamics, ie, they currently focus on number of links
 - This might actually underestimate the relevance of the adjustment in the extensive margin
- Can the authors show a longer panel with a longer post-treatment effect? Would want to see how persistent the effects are, given that the shock is transitory
- Lockdowns involve a mix of demand and supply shocks, can the authors separate both ingredients of the shock?
- Next project: Given that lockdowns happened everywhere at the same time, would be cool to do this for other countries that have firm-to-firm data and compare results

Final Remarks

- Super exciting (and nicely executed) project, bringing new facts into a relevant and global topic
- Looking forward to next iterations of this paper and future research of this agenda

Thanks!