Propagation and Amplification of Local Productivity Spillovers^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.

Overview

Very exciting study of how knowledge and productivity disseminates throughout the economy

- A critical theme in several strands of economic research
- Paper makes several contributions to our understanding of this topic
- Two key features of the paper:
 - 1. Propagation of MDP openings through multi-region firms
 - 2. Develops a quantitative model to understand welfare consequences of knowledge propagation
- Will focus my attention on three comments:
 - I. Productivity estimation
 - II. Mechanisms through the empirics
 - III. Mechanisms through the model

I. Productivity Estimation

- How does the productivity spillover violate the research design? Can the authors build a control group that is immune to the treatment without conditioning on the outcome? Can they use the model to discipline more which is the correct research design that is consistent with the propagation mechanism of the model? More discussion of this issue would be useful
- It is not entirely clear how TFP is estimated. Footnote 9 says something but does not address the usual identification problem in estimating TFP
- Related to point 1 and 2 of this slide: estimating productivity in the context of spillovers is not trivial. It would be good to establish the identification assumptions through the lens of the model that the authors develop. Check out Iyoha (2020)'s JMP for a great discussion of this
- Could the authors show how robust the results are to different TFP measures? E.g., labor productivity, TFP from IO production function approach, cost-share approach
- Small comment: The paper would benefit with more details of several empirical analysis they do, e.g., details behind Table 5, Table A.3 Table A.6

II. Mechanisms Through the Empirics: Trade of Intangibles

- Super relevant fact of the propagation of productivity through the ownership network of firms
 - There is similar evidence of propagation of innovation within firms (Bilir and Morales, 2020)
 - \blacksquare \Rightarrow Focus more on the mechanisms for why there is propagation of knowledge within firms
 - This is key for a microfoundation of the mechanism in the model and the counterfactuals
- There is limited evidence on what these plants actually trade within firms
 - Atalay, Hortacsu, Syverson (2014) claim that they do not trade inputs but rather intangibles
 - Could the authors actually show whether plants within firms trade inputs, workers or intangibles?
- Most striking fact: Global productivity spillover elasticity does not decay with distance
 - Which seems consistent with story on trade of intangibles
 - \blacksquare \Rightarrow Exploit sectoral heterogeneity to correlate elasticity with intangible intensity of sectors
 - E.g., Heterogeneous effects across sectors of Column 1-3, Table A.6
 - In which sectors is propagation stronger? Is it in more intangible intensive sectors?
 - Which intangibles are driving the result?

There must be another dimension in which there is gravity in the trade of intangibles

- To find mechanisms, look for the relevant distance measure for gravity regression of intangibles
- Maybe exploit whether sectoral heterogeneity correlates with communication costs within industries?
- What about distance to the headquarter of the firm?
- Are the results stronger when the affiliate plant is closer to the headquarter?
- Can the authors exploit the ownership structure of the multi-plant firms and use that to understand the mechanism of propagation?
- There is evidence that this structure matters for internal markets of business groups
- Search for what drives trade of intangibles through exploiting heterogeneity of the global spillover effects would make the paper stronger

III. Mechanisms Through the Model

- It's nice that the authors go beyond the reduced-form evidence and develop a quantitative model to understand more their mechanism
- Nevertheless, in its current stage, it is not entirely clear how the model contributes to the paper
- The main theoretical limitation is that the main mechanism is built in into technological primitives
- Thus, the model cannot help in understanding the causes of the mechanism but rather the consequences
- But for now the consequences still look a bit of a black box
- The model has many ingredients, but it is unclear why we need all those ingredients and how they affect the results
- For example, the authors could decompose the overall productivity multiplier by shutting down different ingredients of the model, e.g., labor mobility, preference heterogeneity like amenities
- Also, benchmark the counterfactuals to a version of the model from the literature

III. Mechanisms Through the Model: Going Forward

- Let me move forward to potentially interesting next steps
- The authors implicity argue that the mechanism for the propagation results go through technology
- Can the authors exploit the role of the demand side in the propagation of shocks? E.g., do plants within firms share knowledge not only about technology, but also on how to sell, reach customers and build customer capital, offer amenities to workers?
- Similarly, how would demand shocks propagate through the ownership network?
- Use the model to design optimal MDP policies? Or design place-based innovation subsidies?
- Use the model to revisit growth accounting decompositions a la Baqaee & Farhi?
 - I.e, what is the role of pure technological change versus reallocation between plants in the context of spatial technological spillovers?

- Would be good to see a version of the counterfactual of Section 5.2 where in the case of θ = 0 the model is recalibrated. Otherwise, the comparison is not very clear as the counterfactual model with no knowledge spillovers will miss important moments from the data, such as productivity dispersion between firms
- 2. It would be useful to frame the comparison between the reduced-form and the model as the comparison between partial-equilibrium productivity multipliers of local shocks and general-equilibrium multipliers of local shocks. The authors could compare the PE multiplier (that takes into account the direct and indirect effects through the ownership structure of firms) with the GE multiplier. The authors already have the numbers to do this, but they do not directly compare these numbers

- Super exciting (and nicely executed) project and agenda
- Looking forward to next iteration of this paper and future research of this agenda

Thanks!