CES Lectures

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World Bank

Firm-to-Firm Trade: Measurement and Applications

Dates

- Tuesday, 1 December 2026, 10:15–11:45
- Wednesday, 2 December 2026, 14:15–15:45
- Tuesday, 8 December 2026, 10:15–11:45

The growing availability of firm-to-firm transaction data and advances in artificial intelligence have made it possible to study questions that were previously difficult to address empirically: how shocks propagate through buyer-supplier networks, what determines the formation and survival of trading relationships and how firms reorganize sourcing in response to trade-policy shocks and geo-economic fragmentation.

Constructing reliable measures of these linkages, however, remains challenging. For example, in many commercial datasets, firms are identified primarily through names rather than stable administrative identifiers. The same firm may therefore appear under several names, while distinct firms may sometimes be grouped together. These errors can bias measures of firm entry and exit, concentration, and the evolution of buyer-supplier relationships, and network structure. Entity resolution is therefore essential for accurate measurement of firm dynamics, trading relationships, and network structure. Large language models (LLMs) offer increasingly powerful tools for addressing these measurement challenges.

The course will cover the evolution of methods used to resolve firm identities, from traditional string-matching approaches to machine-learning, transformer, and LLM-assisted methods, with an emphasis on their strengths and limitations, the current methodological frontier, and their suitability for different datasets and research questions. It will then examine how errors in firm identification affect empirical research including measurement of firm entry and exit, buyer-supplier relationships, and network structure, and show how consistently linking firms across datasets, countries, and corporate groups opens the door to a new set of research questions in international trade and production networks.

Course outline:

1. **Leveraging large language models to identify firm to firm linkages:** Cleaning and standardizing names, entity resolution, fuzzy/string matching, machine-learning, and newer LLM-assisted approaches, and ways of validating matches at scale. Extend to identifying ultimate parents and affiliates across countries and over time.
2. **(Mis)Measuring Trade:** This lecture will include examples of different research questions with varying degrees of implications when mismeasured identifiers are used.

3. **Applications:** Examples from international trade and production networks, such as prices in buyer supplier relationships, propagation of shocks through firm networks, multinational sourcing, and how firms reorganize their global networks in response to trade-policy shocks.

Reading List

Lecture 1

1. Melissa Dell (2025). "Deep Learning for Economists." *Journal of Economic Literature*, 63(1), 5–58.
2. Abhishek Arora and Melissa Dell (2024). "LinkTransformer: A Unified Package for Record Linkage with Transformer Language Models." *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics, Volume 3: System Demonstrations*, 221–231.
3. Nils Barlaug and Jon Atle Gulla (2021). "Neural Networks for Entity Matching: A Survey." *ACM Transactions on Knowledge Discovery from Data*, 15(3), 1–37.
4. Ana M. Fernandes, Alejandro Forero, Devaki Ghose, and Piyush Panigrahi (2026). "What's in a Name? Implications of Extensive Margin Mismeasurement in International Trade." Work in progress; paper to be circulated before the course.

Lecture 2

4. Ana M. Fernandes, Alejandro Forero, Devaki Ghose, and Piyush Panigrahi (2026). "What's in a Name? Implications of Extensive Margin Mismeasurement in International Trade." Work in progress; paper to be circulated before the course.
5. Andrew B. Bernard, J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott (2012). "The Empirics of Firm Heterogeneity and International Trade." *Annual Review of Economics*, 4, 283–313.
6. Andrew B. Bernard and Andreas Moxnes (2018). "Networks and Trade." *Annual Review of Economics*, 10, 65–85.

Lecture 3

7. Vanessa I. Alviarez, Michele Fioretti, Ken Kikkawa, and Monica Morlacco (2023; revised 2026). "Two-Sided Market Power in Firm-to-Firm Trade." NBER Working Paper No. 31253.
8. Brian C. Fujiy, Devaki Ghose, and Gaurav Khanna (2024). "Production Networks and Firm-Level Elasticities of Substitution." *World Bank Policy Research Working Paper* No. 10782.
9. Manuel Garcia-Santana, Devaki Ghose, and Bob Rijkers. "How (In)efficient Are Governments? Evidence from Import Transactions Data." Work in progress.