Firm Dynamics and Aggregate Productivity

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Schedule. Tuesdays 13:30-15:00 and 15:15-16:45, and Thursdays 15:15-16:45

Structure. The course lasts 5 weeks with 3 sessions per week. We will have 2 sessions of theory and 1 practical, mostly computational, every week, except for the first week with only theory sessions.

Objective. There are large differences in income per capital across countries. Those differences have been attributed mainly to differences in aggregate productivity. Taking firms or plants as basic units of production, the aggregate productivity of the country can be decomposed into two terms. The first one is an aggregate of the firm-level productivity of all the firms operating in the economy, i.e. the distribution of productivity across firms. The second is the distribution of economic resources across those heterogeneous firms. If the most productive firms do not have access to more capital and labor than the lower productive counterparts, the aggregate productivity of the country will be lower. This course covers how firms and their dynamics affect the aggregate economy studying these two channels.

Contents.

1. Introduction
2. Static Model
3. Dynamic Model
4. Entrepreneurship
5. Endogenous Productivity

Previous knowledge. The students are assumed to be familiar with basic estimation techniques, which includes GMM, and dynamic programming. If you need to review the econometric techniques we will use, Arellano, Manuel, 2003. "Panel Data Econometrics" is good reference. If you need to review dynamic programming, Stokey, Nancy L., Robert E. Lucas, and Edward C. Prescott. 1989 "Recursive Methods in Economic Dynamics" is a good reference. Some knowledge of Stata and especially of Matlab or Julia will be needed for the practical sessions.

Part I. Introduction

- Duration: 2 theory session
- Program:
  - Introduction to Programming
  - Economic Growth and Development
  - Stylized Facts of Firm Dynamics
  - Firms and the Aggregate Economy
- References:
  - Alfaro, Laura and Charlton, Andrew, and Kanczuk, Fabio. 2008. "Plant-Size Distribution and Cross-Country Income Differences." HBS Working Paper No. 07-086.
  - Bartelsman, Eric, Haltiwanger, John, and Scarpetta, Stefano. 2009. "Measuring and Analyzing Cross-country Differences in Firm Dynamics." p. 15 - 76 in "Producer Dynamics: New Evidence from Micro Data." National Bureau of Economic Research, Inc.
  - Bento, Pedro, and Diego Restuccia. 2020. "On average establishment size across sectors and countries." Journal of Monetary Economics.
  - Cabral, Luís, M B, and José Mata. 2003. "On the Evolution of the Firm Size Distribution: Facts and Theory." American Economic Review, 93 (4): 1075 - 1090.
  - Evans, David S. 1987. "Tests of Alternative Theories of Firm Growth." Journal of Political Economy 95, no. 4: 657 - 674.
  - Jones, C.I. 2016. Chapter 1 - "The Facts of Economic Growth." Editor(s): John B. Taylor, Harald Uhlig in "Handbook of Macroeconomics." Elsevier, Volume 2.

Part II. Static Model

- Duration: 3 theory sessions + 2 practical sessions
- Program:
  - Simple Static Model
  - Aggregation
  - Production Function Estimation and Firm-Level Productivity
  - Exogenous Productivity Dynamics
  - Introducing Firm-Level Distortions
- References:
  - Guner, Nezih, Gustavo Ventura, and Yi Xu. 2008. "Macroeconomic implications of size-dependent policies." Review of Economic Dynamics 11, no. 4: 721 – 744.

- Hsieh, Chang-Tai, and Peter J. Klenow. 2009. "Misallocation and Manufacturing TFP in China and India." The Quarterly Journal of Economics 124, no. 4: 1403 - 1448.
- Levinsohn, James, and Petrin, Amil. 2003. "Estimating Production Functions Using Inputs to Control for Unobservables." Review of Economic Studies 70, no. 2: 317 - 341.
- Lucas, Robert. 1978. "On the Size Distribution of Business Firms." The Bell Journal of Economics 9, no. 2: 508–523.
- Olley, G. Steven, and Ariel Pakes. 1996. "The Dynamics of Productivity in the Telecommunications Equipment Industry." Econometrica 64, no. 6: 1263 - 1297.
- Restuccia, Diego, and Richard Rogerson. 2008. "Policy distortions and aggregate productivity with heterogeneous establishments." Review of Economic Dynamics 11, no. 4: 707 - 720.
- Ruiz-García, Juan Carlos. 2020. "Financial Frictions, Firm Dynamics and the Aggregate Economy: Insights from Richer Productivity Processes." Job Market Paper.

Part III. Dynamic Model

- Duration: 3 theory sessions + 1 practical sessions
- Program:
  - Adjustment Costs
  - Financial Frictions
  - Introducing General Equilibrium
  - Demand Accumulation
- References:
  - Cooley, Thomas F., and Vincenzo Quadrini. 2001. "Financial Markets and Firm Dynamics." American Economic Review 91, no. 5: 1286 – 1310.
  - Cooper, Russell W., and John C. Haltiwanger. 2006."On the Nature of Capital Adjustment Costs." The Review of Economic Studies 73, no. 3: 611 – 633.
  - Foster, L., Haltiwanger, J., and Syverson, C. 2016. "The Slow Growth of New Plants: Learning about Demand?." Economica, 83: 91 - 129.
  - Hopenhayn, Hugo A. 1992. "Entry, Exit, and firm Dynamics in Long Run Equilibrium." Econometrica 60, no. 5: 1127 - 1150.
  - Hopenhayn, Hugo A., and Richard Rogerson. 1993. "Job Turnover and Policy Evaluation: A General Equilibrium Analysis." Journal of Political Economy 101, no. 5: 915 - 938.
  - Khan, Aubhik, and Julia K. Thomas. 2013. "Credit Shocks and Aggregate Fluctuations in an Economy with Production Heterogeneity." Journal of Political Economy 121, no. 6: 1055 - 1107.

Part IV. Entrepreneurship

- Duration: 2 theory sessions + 1 practical session
- Program:
  - Worker vs Entrepreneur
  - Manufacturing vs Services
  - Informal vs Formal Sector
  - Agriculture vs Non-Agriculture
- References:
  - Adamopoulos T, Brandt L, Leight J, Restuccia D. 2020 "Misallocation, Selection, and Productivity: A Quantitative Analysis with Panel Data from China." NBER Working Paper 23039.
  - Buera, Francisco J., Joseph P. Kaboski, and Yongseok Shin. 2011. "Finance and Development: A Tale of Two Sectors." American Economic Review 101, no. 5: 1964 – 2002.
  - Midrigan, Virgiliu, and Daniel Yi Xu. 2014. "Finance and Misallocation: Evidence from Plant-Level Data." American Economic Review 104, no. 2: 422 – 458.
  - Moll, Benjamin. 2014. "Productivity Losses from Financial Frictions: Can Self-Financing Undo Capital Misallocation?." American Economic Review 104, no. 4: 3186 – 3221.

Part V. Endogenous Productivity

- Duration: 1 theory session
- Program:
  - Technology Adoption
  - R&D Expenditure and Innovation
  - Creative Destruction or "Schumpeter" Innovation
- References:
  - Aghion, Philippe, and Peter Howitt. 1992. "A Model of Growth Through Creative Destruction." Econometrica 60, no. 2: 323 - 351.
  - Doraszelski, Ulrich, and Jordi Jaumandreu. 2013. "R&D and Productivity: Estimating Endogenous Productivity." The Review of Economic Studies 80, no. 4: 1338 - 1383.
  - Hsieh, Chang-Tai, and Peter J. Klenow. 2014. "The Life Cycle of Plants in India and Mexico" The Quarterly Journal of Economics 129, no. 3: 1035 – 1084.