Discussion by Diego Puga of

A Theory of Growth and Volatility at the Aggregate and Firm Level

by Diego Comin and Sunil Mulani

Motivating facts

- Steady increase in R&D expenditures.
- No steady increase in mean aggregate productivity (slowdown before recent increase).
- Fall in volatility of aggregate productivity.
- Increase in volatility of firm-level productivity.
- Firms that do more R&D more likely to improve their productivity.

The model

- Final expenditure split into given shares for:
  - Leading product produced with intermediate input from a single firm.
  - Standardized product produced with non-differentiated intermediate inputs from many firms.
- Innovation by leading firm:
  - Is always general purpose process innovation.
  - Benefits all firms — not just the innovating firm — by reducing their costs.
  - Does not show up in R&D statistics.
- Innovation by other firms:
  - Is always product innovation.
  - Benefits only the innovating firm by turning it into new leader — and harms current leader.
  - Shows up in R&D statistics.

Thought experiment

- Exogenous increase in success rate of innovation by non-leading firms (due to R&D subsidies, etc.):
  - Increases (leading-product-development, privately-beneficial) innovation by followers.
  - Increases turnover of leading firm.
  - Reduces value of leading firm.
  - May reduce (general-purpose, aggregate-productivity-enhancing) innovation by leading firm.

Comments

- Discuss alternative explanations (e.g. productivity benefits of GPT usually show up only after long period of R&D investment).
- Idea that some types of innovative effort enhance firm-level productivity and others aggregate productivity seems appealing.
- However, full identification of one type of innovation with industry leader and the other with remaining firms makes it difficult to separate
  - changing incentives for each type of innovation
  - from changing incentives for leader and followers.
- Leader-follower innovation races complex, implications of closer followers not clear-cut.

- Possible alternative:
  - Innovation to do something new (firm-level and aggregate benefits).
  - Innovation to do something that is already done circumventing patents (only firm-level benefits).
  - Changing ease to do each type of innovation.