Comments to:

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

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What they do...

On the empirical side

- Point out two empirical facts of the post-war U.S economy.

    1. No clear (positive) relation between aggregate productivity growth and private R&D investment share in GDP in US data, 1953-99 (as predicted by some models): figure 1.

    2. Opposite trends between the volatility of aggregate productivity growth and firm level productivity growth. Aggregate volatility decreasing and firm level volatility increasing: figure 2.

- Focus on second moments (sometimes neglected in the growth literature).

What they do...

On the theoretical side

- Current existing GE endogenous growth models have a hard time explaining these facts.

- Their model is able to disentangle firm productivity dynamics from aggregate productivity dynamics (first and second moments). In doing so, they shed light on the long run determinants of productivity growth.

- Model's main characteristics (builds on quality-ladder models (Aghion and Howitt [1992], Grossman and Helpman [1991]) for modeling R&D innovations).

  Two types of innovations:

New products to replace current leading products (these will be excludable, firm specific and the result of investment in R&D, they have an asymmetric effect on other firms).

General innovations (partially none excludable, firm specific and affecting many firms symmetrically). For example: mass production systems (Ford assembly line), human resources management (survey feedback), trade (malls'), etc...

Basic mechanism:

There is a trade off between investment in R&D and general innovations.

R&D is more valuable for small firms (entrants) since it leads to market turnover (incumbents incur in losses). Leading to high firm level volatility.

General innovations are more valuable for large leading firms. Leading to high aggregate volatility.

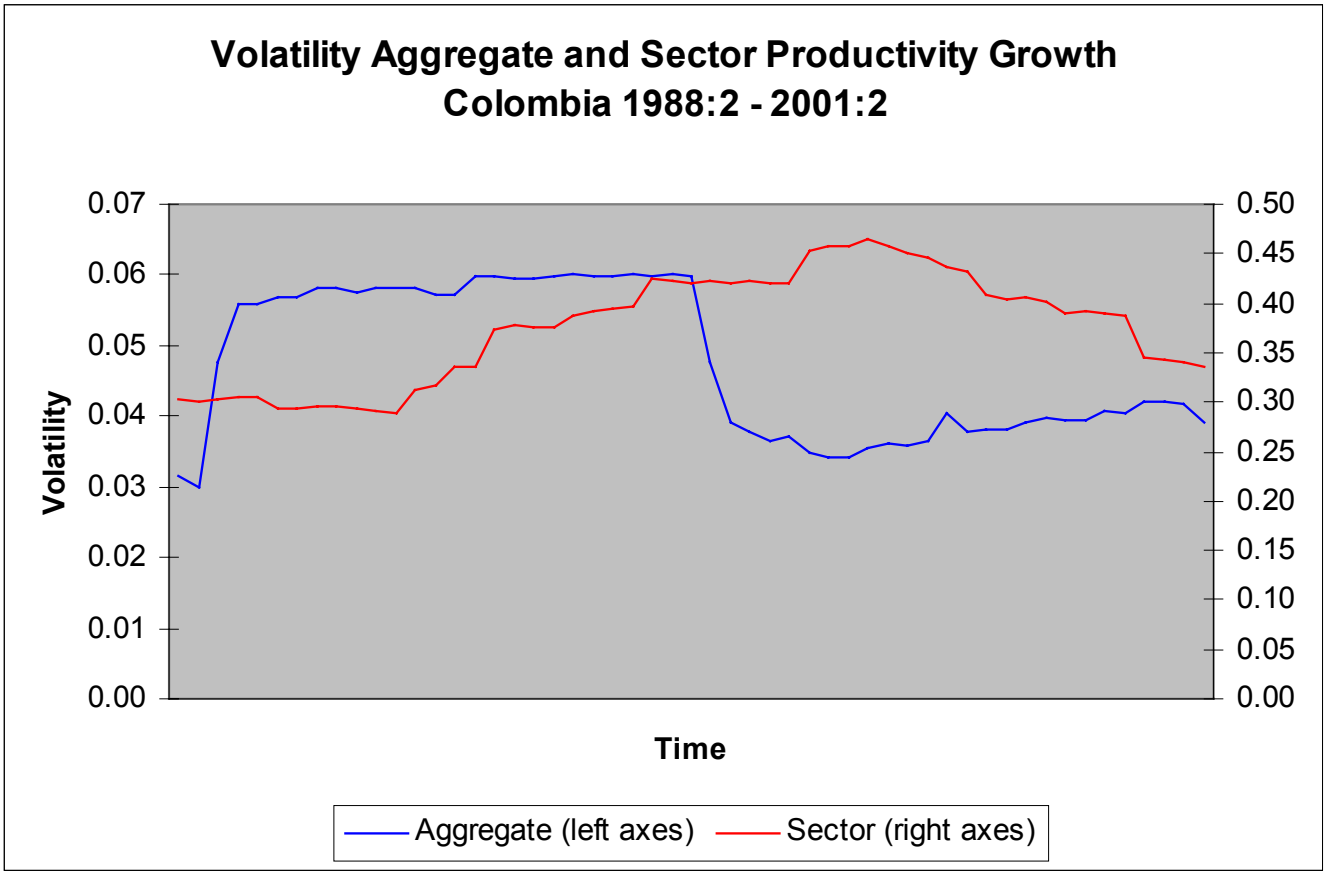
Comments on the empirical side...

General comments

- Though sometimes ignored by the growth literature, documenting empirical regularities regarding second moments at the aggregate and micro level (volatility and correlation's) might be very illuminating to understand the determinants of productivity growth.
- The authors recognize the lack of evidence between turnover and general innovations. Their list (incomplete) include innovations before the 1960's when turnover was low. But it completely ignores "general innovations" in the last forty years. One to highlight are financial derivatives.
- Why? In general, in underdeveloped financial systems, exposure to volatile economic environments will be more harmful.
- This might be important to understand productivity dynamics in developing countries that, as I will suggest, might be VERY different to the empirical facts they report.

- Even in the U.S, they provide weak evidence (in Comin and Phillipon [2005]) against the hypothesis that financial development has played a key role in reducing aggregate volatility.
- To be methodologically consistent, only in a full fledged model of innovation and financial deepening we should argue in favor or against this hypothesis (as they well do, in calibrating their own model to test their own hypothesis).

Volatility of Aggregate and Sector Productivity Growth



- The data suggest exactly the opposite!
- No claim that this are facts (suggestive?).

- The most crude quantification.

Centered Rolling Window Years	Correlation, Volatility Aggregate & Sector Productivity Growth
4	-0.24
6	-0.46

- Results are very sensitive to rolling window.

- Is this an empirical regularity in developing countries (i.e., the opposite trends in the volatility of aggregate and sector productivity trends present in US data)?

- Checking these would be nice, for it will require from growth and development theorists, to search deeper into the different productivity determinants of developed vs. developing countries (for example, lots have been learned from documenting the difference between fiscal policy in developing vs. developed countries at business cycle frequencies).

Other comments: model and validation technique...

- How sensitive are the quantitative results to the functional form and parameterization of labor costs of producing intermediate goods.

- Authors provide econometric evidence of operating channels. It will me more methodologically consistent to simulate the model and compare simulated data and real data using the mentioned statistical tools.

- Calibration exercises are not meant to replicate some other of the empirical regularities that motivated the model.

Concluding remarks (their main contribution)

- Very interesting article that points out to a few empirical regularities related to productivity growth at the aggregate and firm level.

- They build up and endogenous growth model with embodied and disembodied innovations and imperfect competition that disentangles this macro and micro dynamics of productivity and sheds light on productivity determinants.