Discussion of ‘Endogenous Technology Adoption and R&D as Sources of Business-Cycle Persistence’ by Anzoategui, Comin, Gertler, and Martinez

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The paper…

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The current version of the paper is sketchy on the empirical foundations; it lavishes most of its effort on a general-equilibrium model with all the usual DSGE complications plus endogenous technical progress.
First empirical question

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Also true of software, but large cutbacks in equipment and structures investment.
Indexes of real R&D spending, NIPA and NSF
Index of real software spending, NIPA
INDEX OF REAL EQUIPMENT SPENDING, NIPA
Index of real non-residential structures spending, NIPA
Fig 2 of the paper: departures of real per-capital R&D spending from trend
Alternative version of Fig 2: NIPA spending, trend from 1999 only
Second empirical question: cyclical effects on adoption

Based on regressions,

\[ \Delta \log \frac{m_{i,t}}{1 - m_{i,t}} = \alpha_i + G(lag_{i,t}) + \beta \hat{y}_t + \epsilon_{i,t} \]
SECOND EMPIRICAL QUESTION: CYCLICAL EFFECTS ON ADOPTION

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Really hard to find any confirmation in Fig 3
Adoption in the US

Figure 3: Speed of Diffusion

−0.3
−0.25
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2

Finally, Andrews et al. (2015) have recently provided complementary evidence that technology diffusion in OECD countries may have slowed during the Great Recession. In their study, they show that the gap in productivity between the most productive firms in a sector (leaders) and the rest (followers) has increased significantly during the Great Recession. Andrews et al. (2015) show that the most productive firms have much greater stocks of patents which suggests that they engage in more R&D activity. They interpret the increase in the productivity gap as evidence that followers have slowed down the rate at which they incorporate frontier technologies developed by the leaders.

These co-movement patterns between the business cycle and measures of investments in technology development as well as measures of the rate of technology adoption is, in our view, sufficiently suggestive evidence to motivate the quantitative exploration we conduct through the lens of our model.

In manufacturing the productivity gap increased by 12% from 2007 and 2009, and in services by approximately 20%.
Decomposition of endogenous technology

Figure 11: Sources of Endogenous Technology
Close to stable R&D spending, but slower adoption post-crisis

Leading-edge firms continue to innovate, but others fall behind
Leading-edge firms continue to innovate, but others fall behind. Higher effective cost of capital is a primary reason for the lag.

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