The decline of research in corporate research and development (R&D)

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Findings: Firms investing less in research even as overall R&D increases

- Absolute spending below 1999 in real terms
- Share of business in U.S. research is 30%, down from 45% (1990s)
- Share of research in business research is 20%, down from 30% (1990s)

Implication: Less “R”, more “D”
Finding: Publication activity falls, while patenting increases, in a broad range of industries.

Implication: **Less R, more D**
**Finding**: The decline in corporate research is broad-based, present in a range of industrial sectors

**Implication**: The causes “Less R, more D” are broad-based

**Source**: NSF Science and Engineering Indicators, various years

The figures present the share of basic and applied research in total domestic R&D paid and performed by companies. The data is based on NSF’s Survey of Industrial Research and Development (SIRD) for 1996-2007 and the Business R&D and Innovation Survey (BRDIS) since 2008. Chem&Pharma- SIC 28 and NAICS 325; Electr&Semicond- SIC 357 & 36 and NAICS 334; Machinery- SIC 351–56 & 358–59 and NAICS 333.
Decline in private value of research

Finding: The value of publications has dropped and the value of patents has increased over time for both investors and managers.

Implication: Over time, firms and investors value “D” relative to “R”.

Source: Arora, Belenzon, Patacconi, NBER 2015

Finding: VC-backed startups also focus on D rather than R
Implication: Startups will not pick up the slack

Source: Arora et al. 2017. in progress
Finding: Corporate patents cite science at higher rates over time; cited science is not older science

Implication: R remain useful for D

Finding: Corporate patents cite external science at higher rates over time

Implication: Firms rely on externally funded R for D, including federally funded R

Source: Arora, Belenzon, Patacconi, NBER 2015; Arora, Belenzon, Sheer, NBER 2017
Conclusions & implications

Findings
• Corporations are withdrawing from research
• Startups will not fill the breach
• Research findings continue to be relevant for invention
• Corporations are using external research

Interpretation: A division of innovative labor
• Reallocation of research from large corporate labs to more efficient and specialized research organizations (e.g., universities)
• Established firms source inventions from universities, often through start-ups

Policy Implications
• Public funding for research is even more important for maintaining American competitiveness