

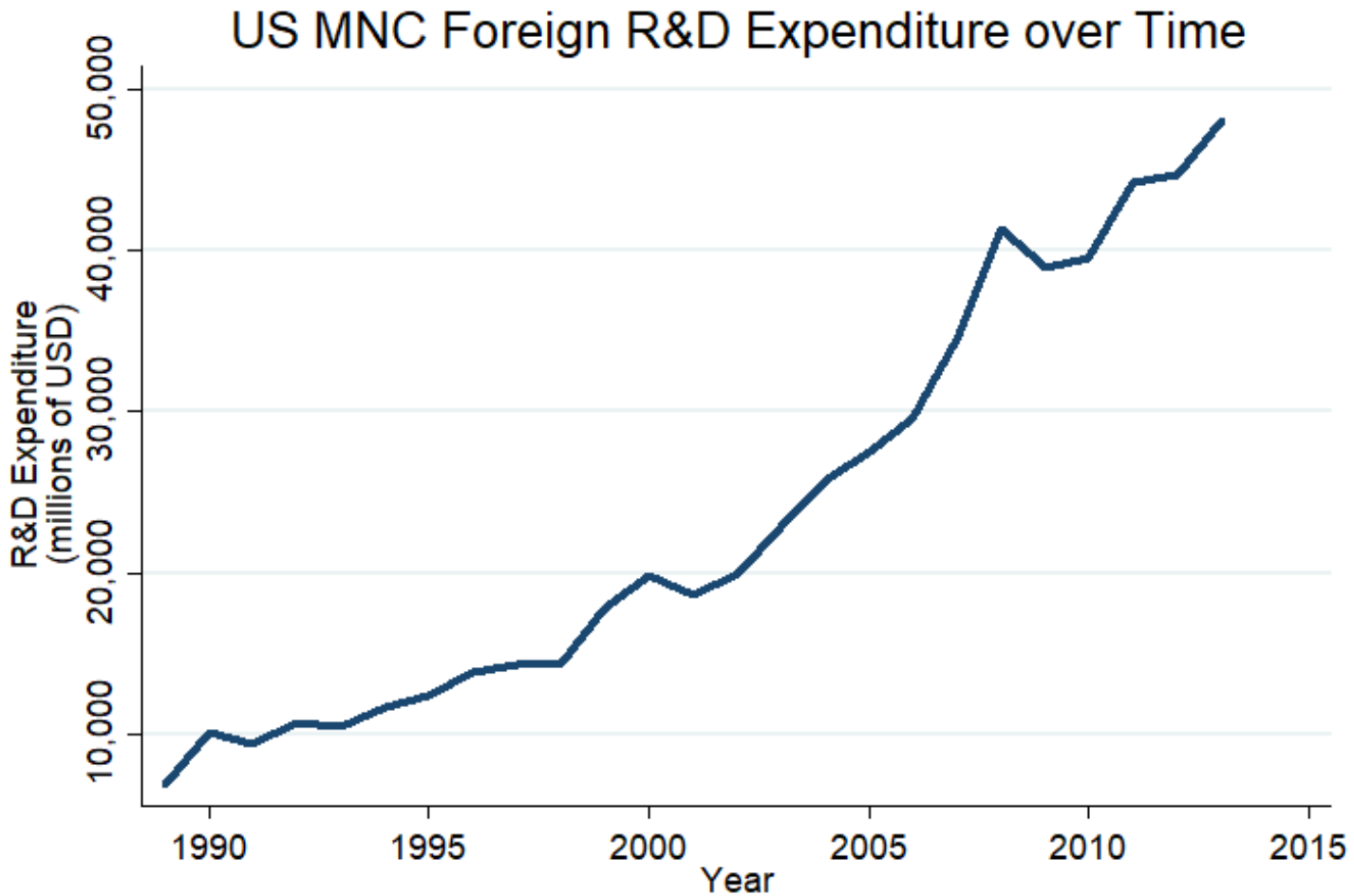
The New Global Invention Machine: A Look Inside the R&D Networks of U.S. Multinationals

Lee Branstetter, Carnegie Mellon University and NBER

Britta Glennon, University of Pennsylvania

Brad Jensen, Georgetown University and NBER

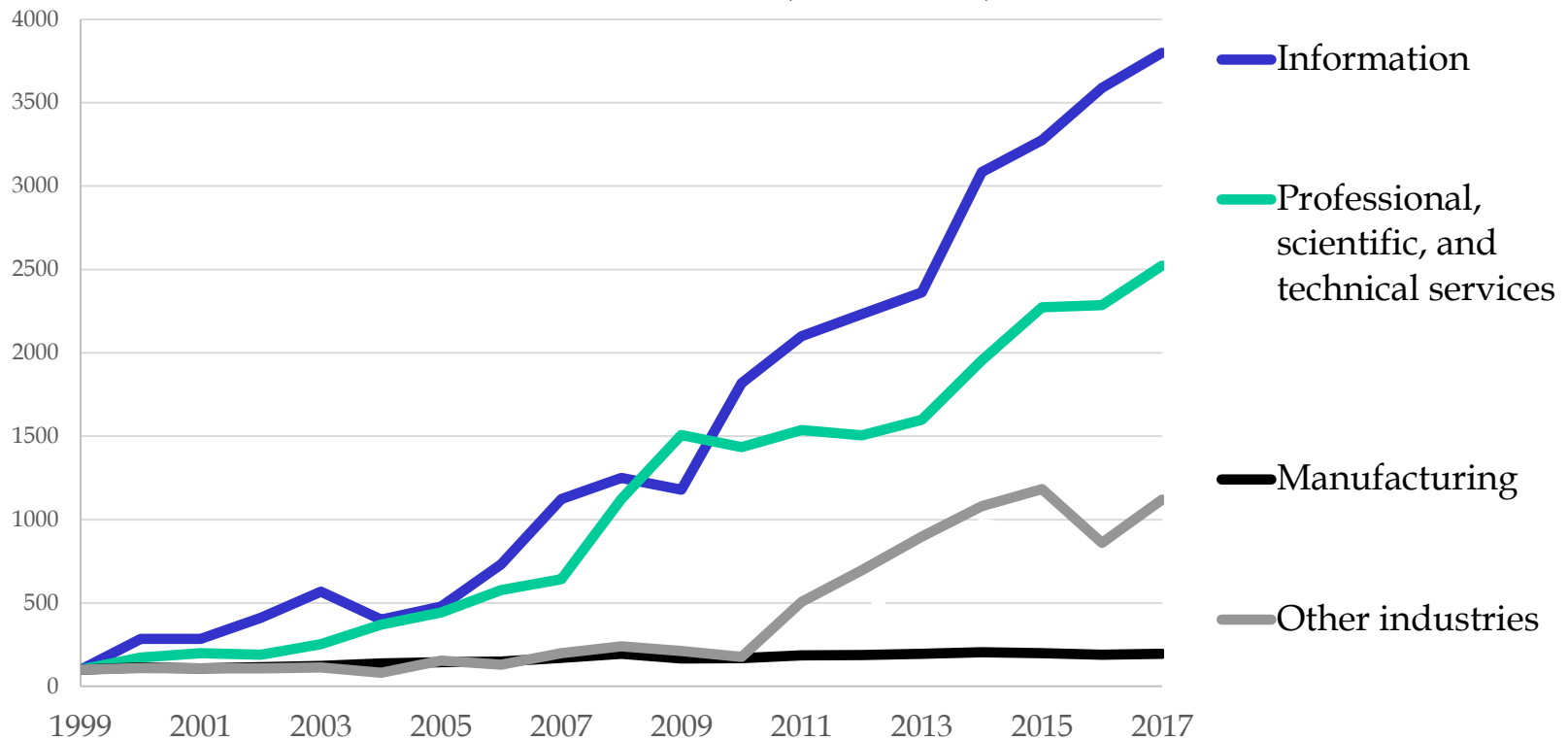
Since 1990, foreign R&D has grown 5-fold



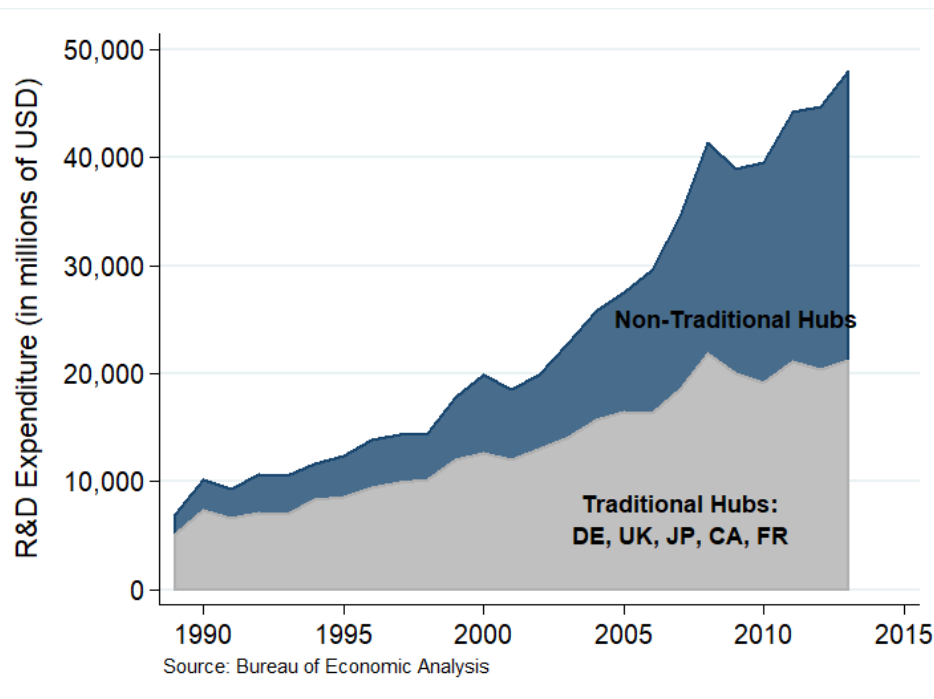
Source: Bureau of Economic Analysis

...with particularly striking increases in information and in professional, scientific, and technical services

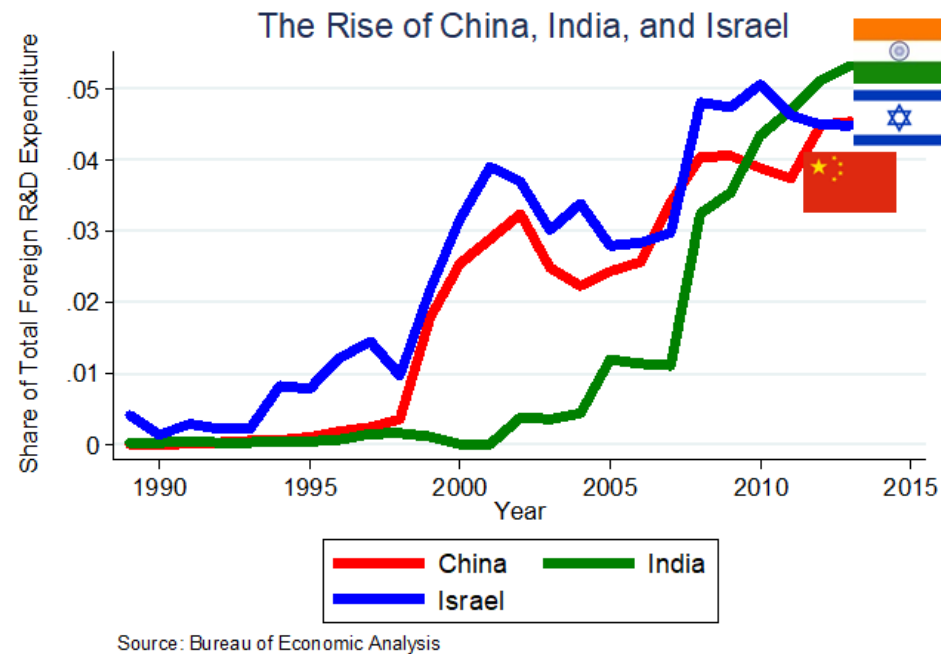
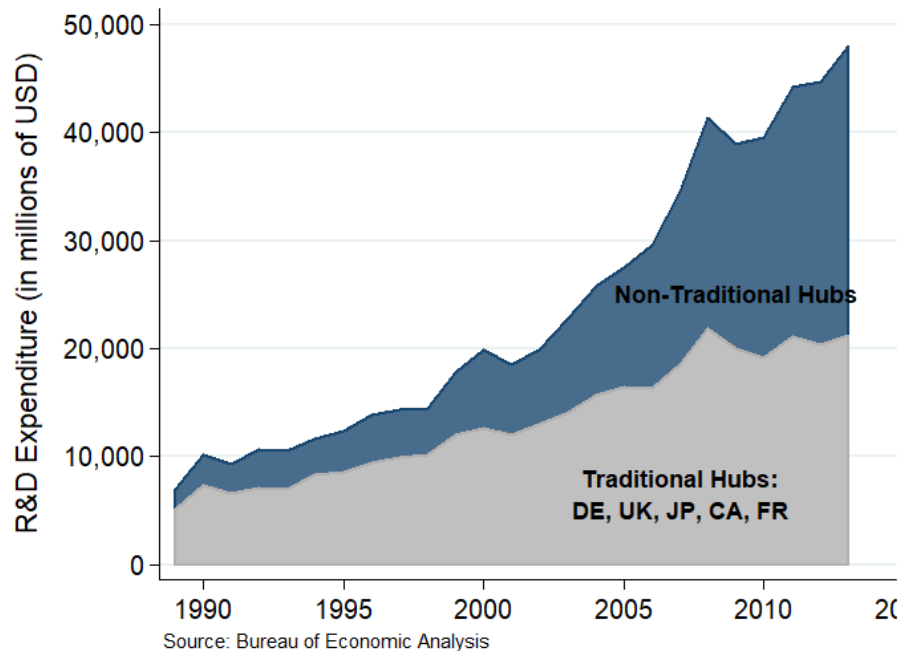
R&D Expenditures by US MNC Foreign Affiliates
by Industry of Foreign Affiliate,
Indexed (1999=100)



MNC foreign R&D used to be concentrated in a few advanced economies, but its geographic distribution has dramatically expanded



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One driver is the growing importance of software and IT hardware in innovation



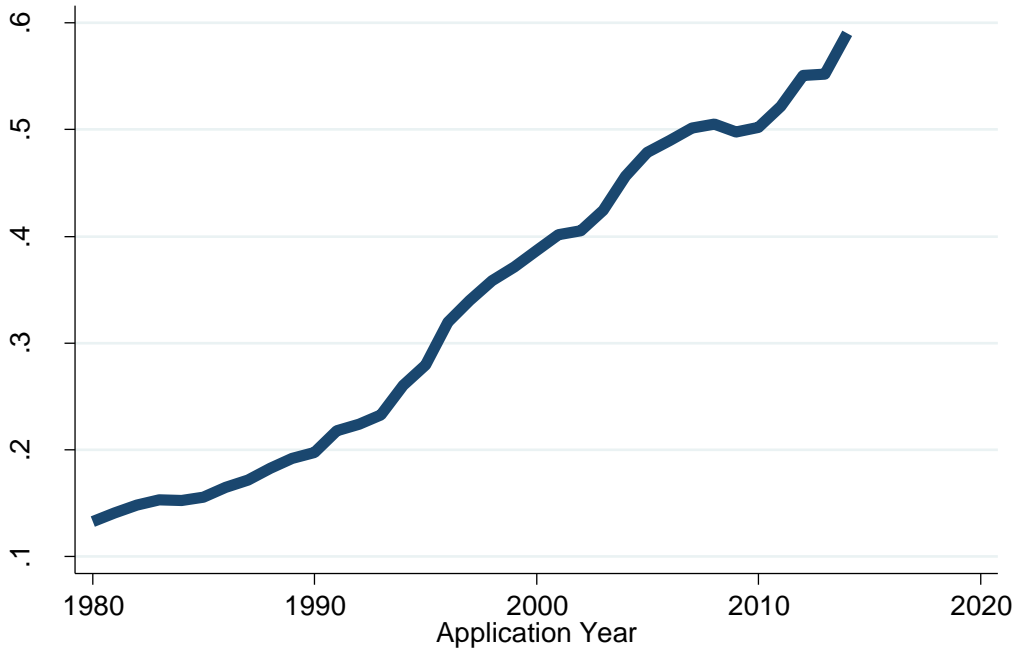
IT- and software-biased shift in innovation

Increased demand for software/IT-related human capital that was not fully met

US MNCs do R&D abroad in “new hubs” that have large quantities of STEM workers

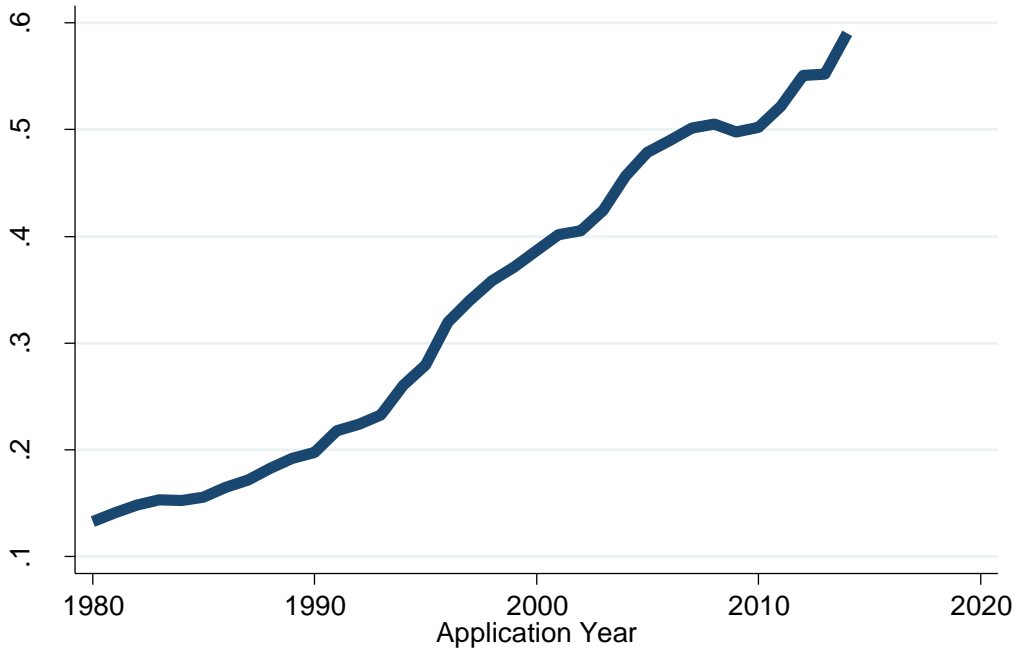
IT and software have become much more important in US innovation

Growth in the Proportion of USPTO Patents that are Software or IT Hardware



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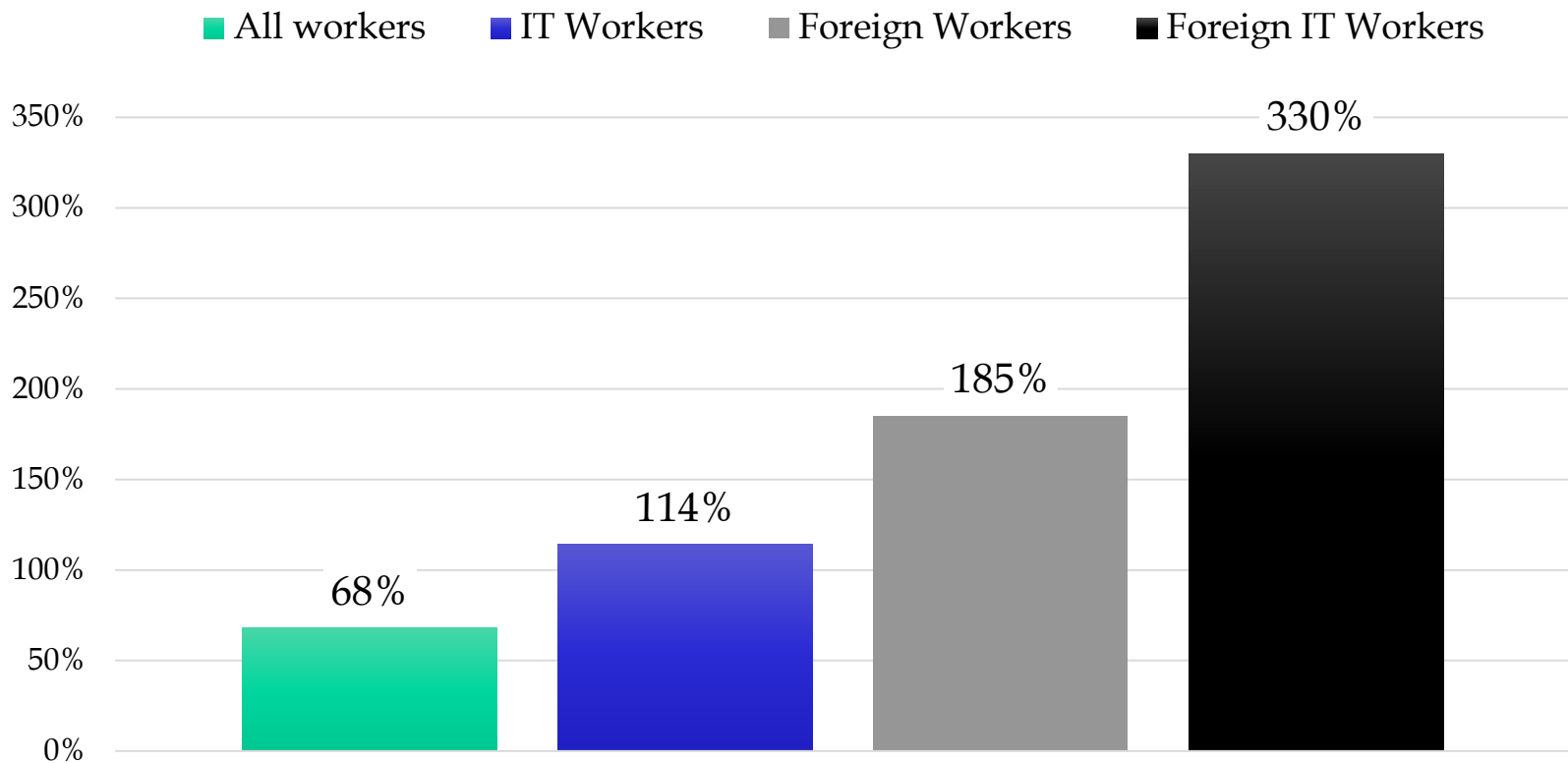
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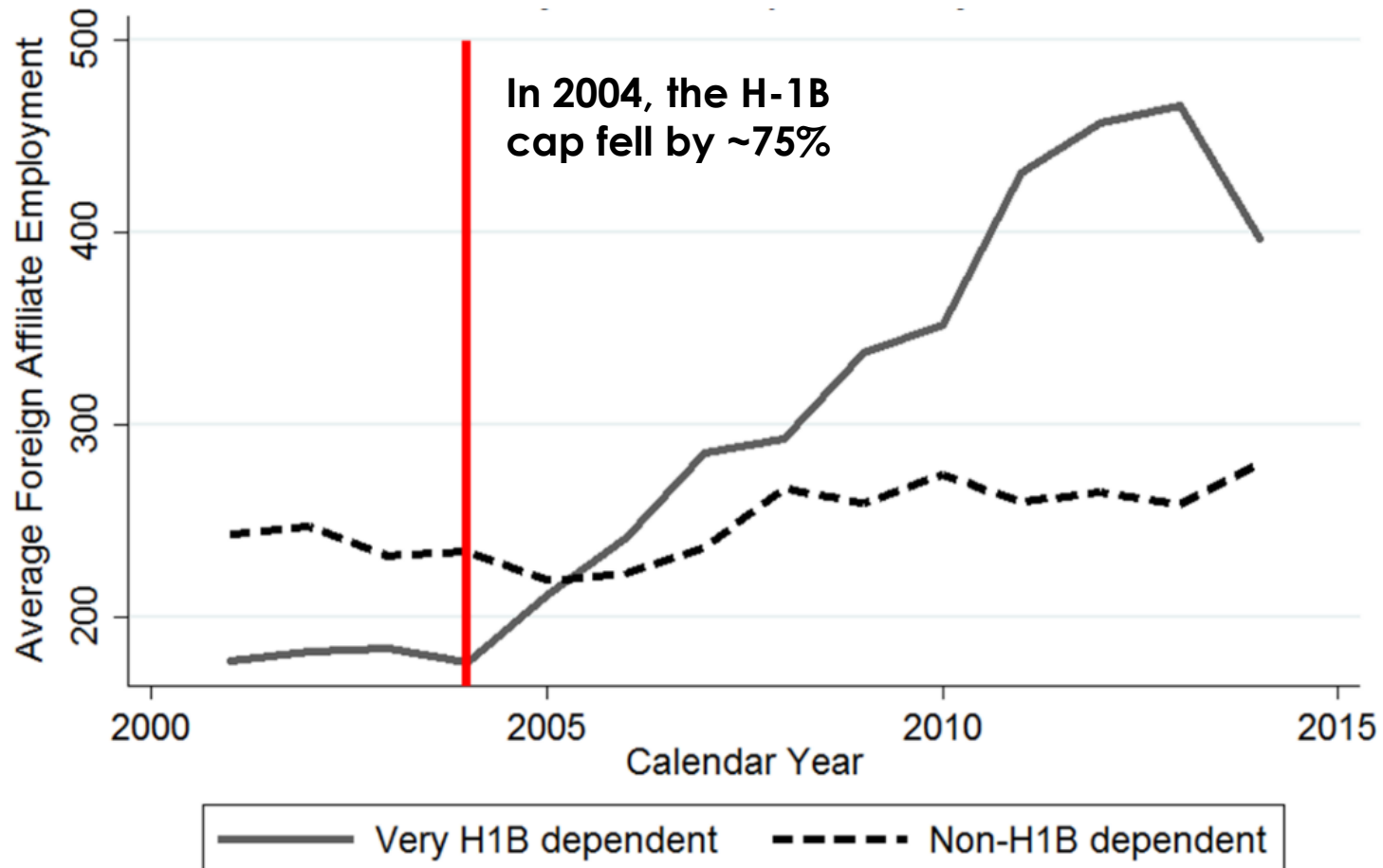
IT and software are also domains where geographic disaggregation is easier

Demand for talent in these domains was partly addressed with imports of foreign talent...

Growth in US college-educated workforce, 1993-2010

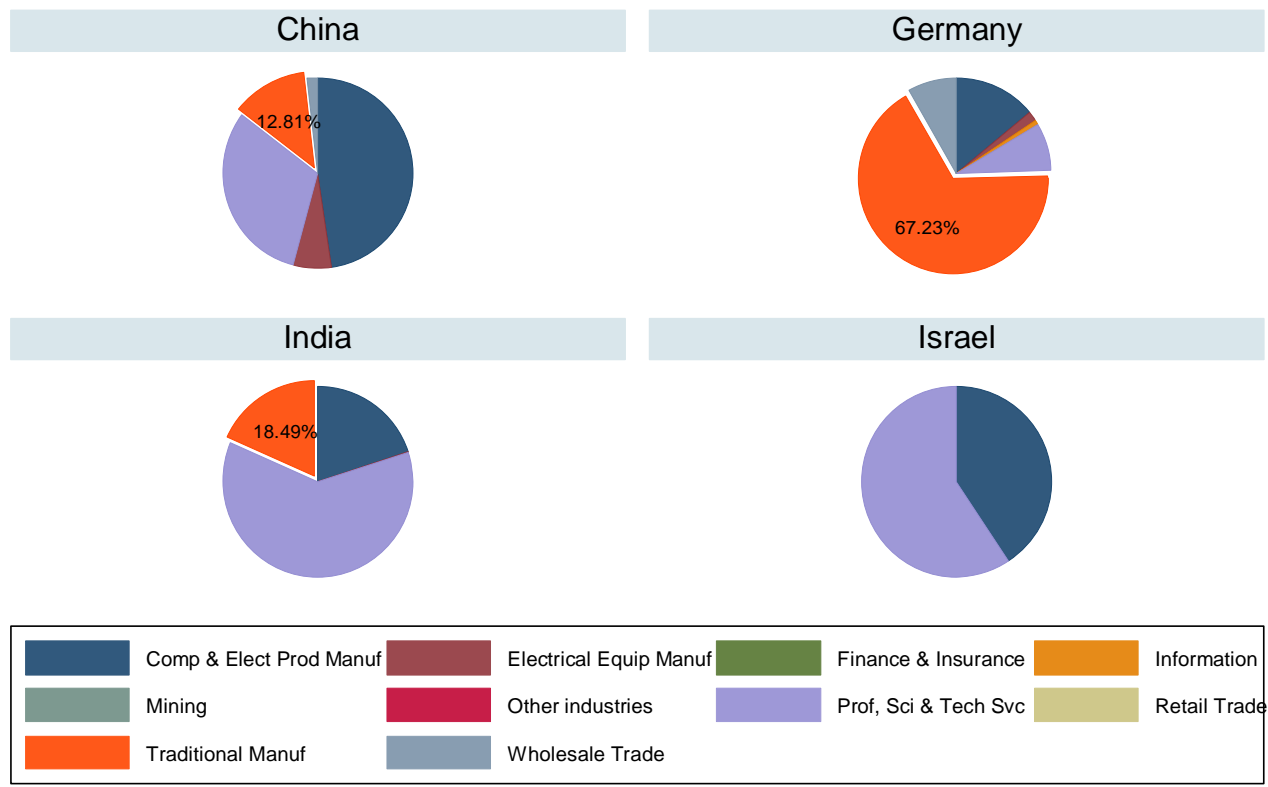


...and partly addressed by accessing foreign talent abroad – especially when immigration restrictions were more constraining



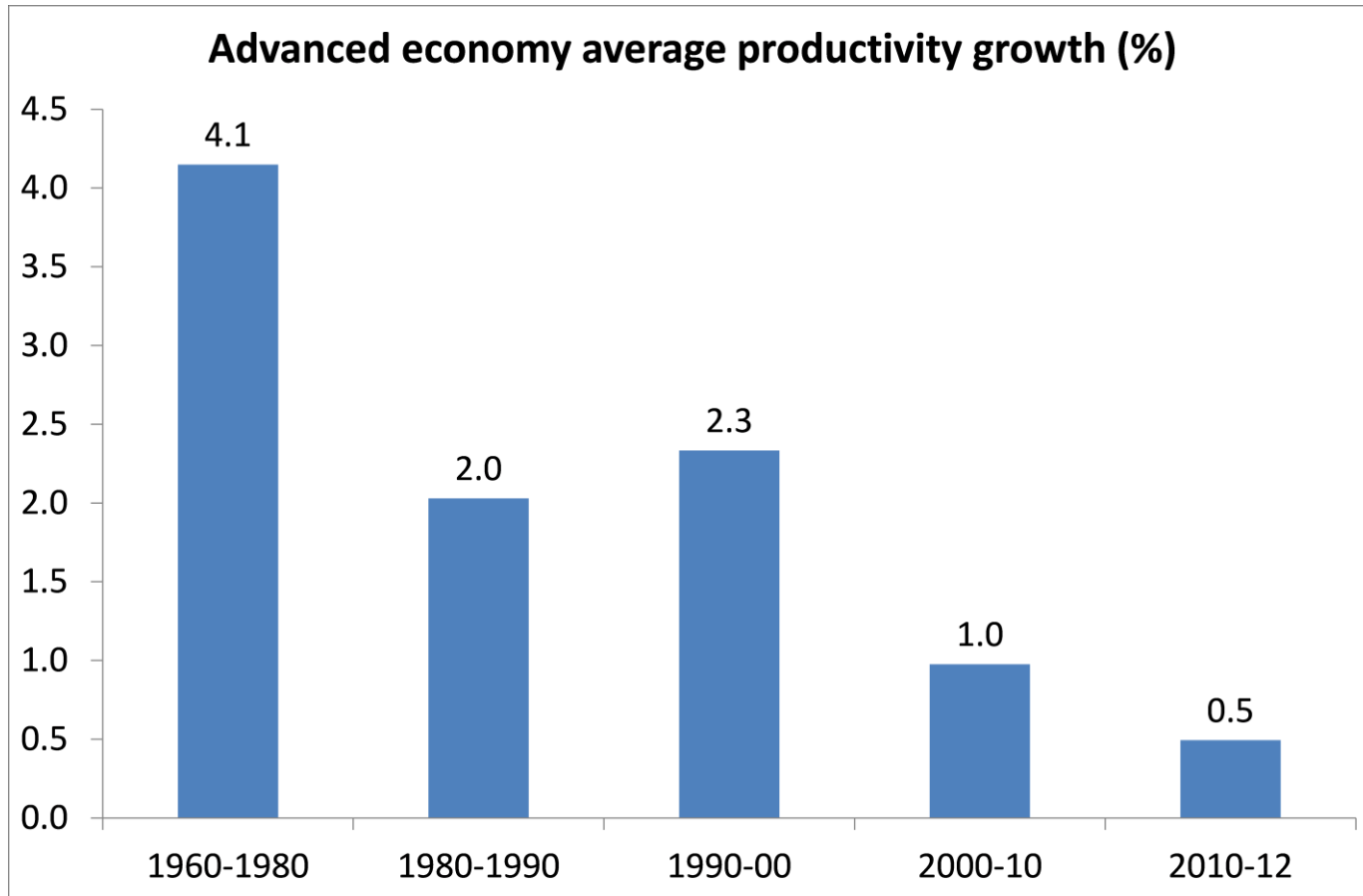
Specialization according to comparative advantage?

R&D Performed by Affiliates in 2009, by Industry of Affiliate



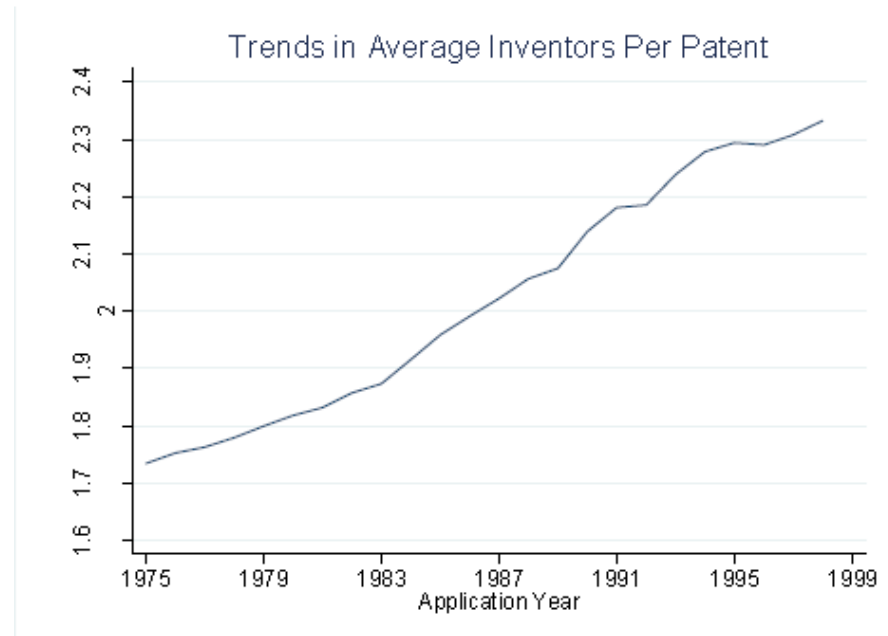
Note: Traditional Manufacturing includes Chemical, Food, Machinery, Primary & Fabricated Metals, Transportation Equipment
Source: BEA

Could R&D globalization be a way to reverse the global productivity slowdown?



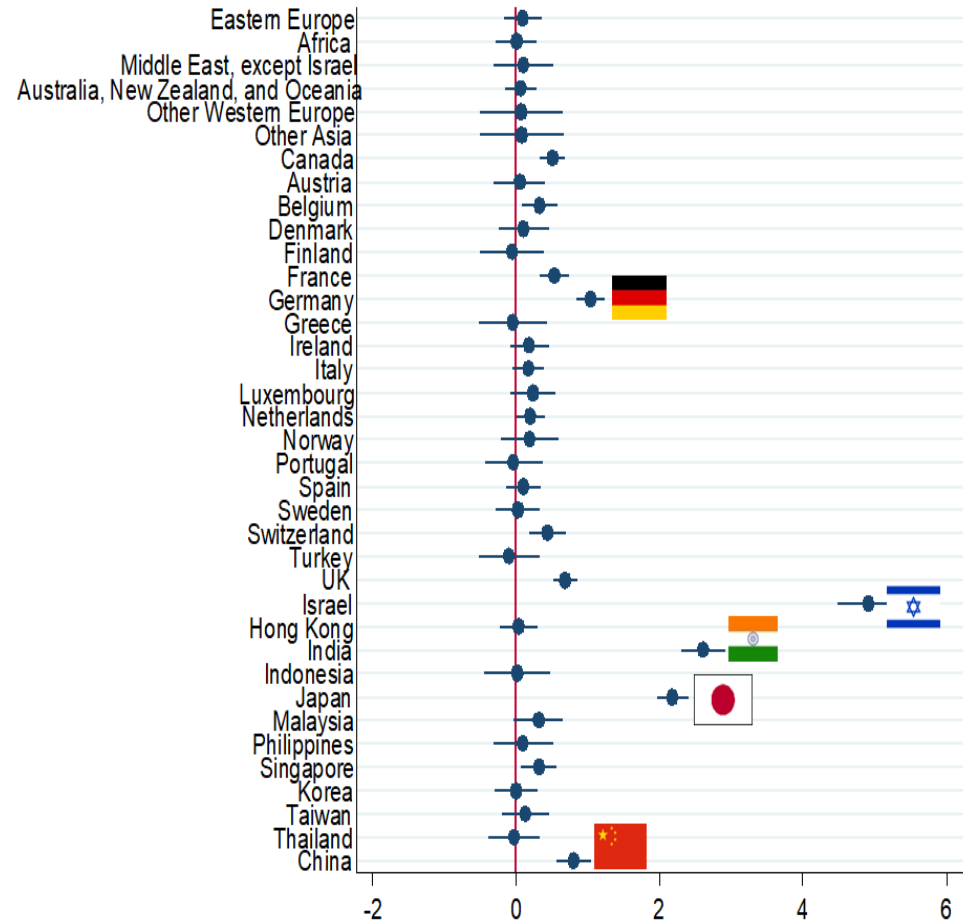
Could R&D globalization be a way to reverse the global productivity slowdown?

- The “burden of knowledge” concept implies that the *scale* of investment in innovation matters



Could R&D globalization be a way to reverse the global productivity slowdown?

- The “burden of knowledge” concept implies that the *scale* of investment in innovation matters
- Many of the “new” R&D hubs appear to have higher-than-typical R&D productivity within MNC networks



Takeaways

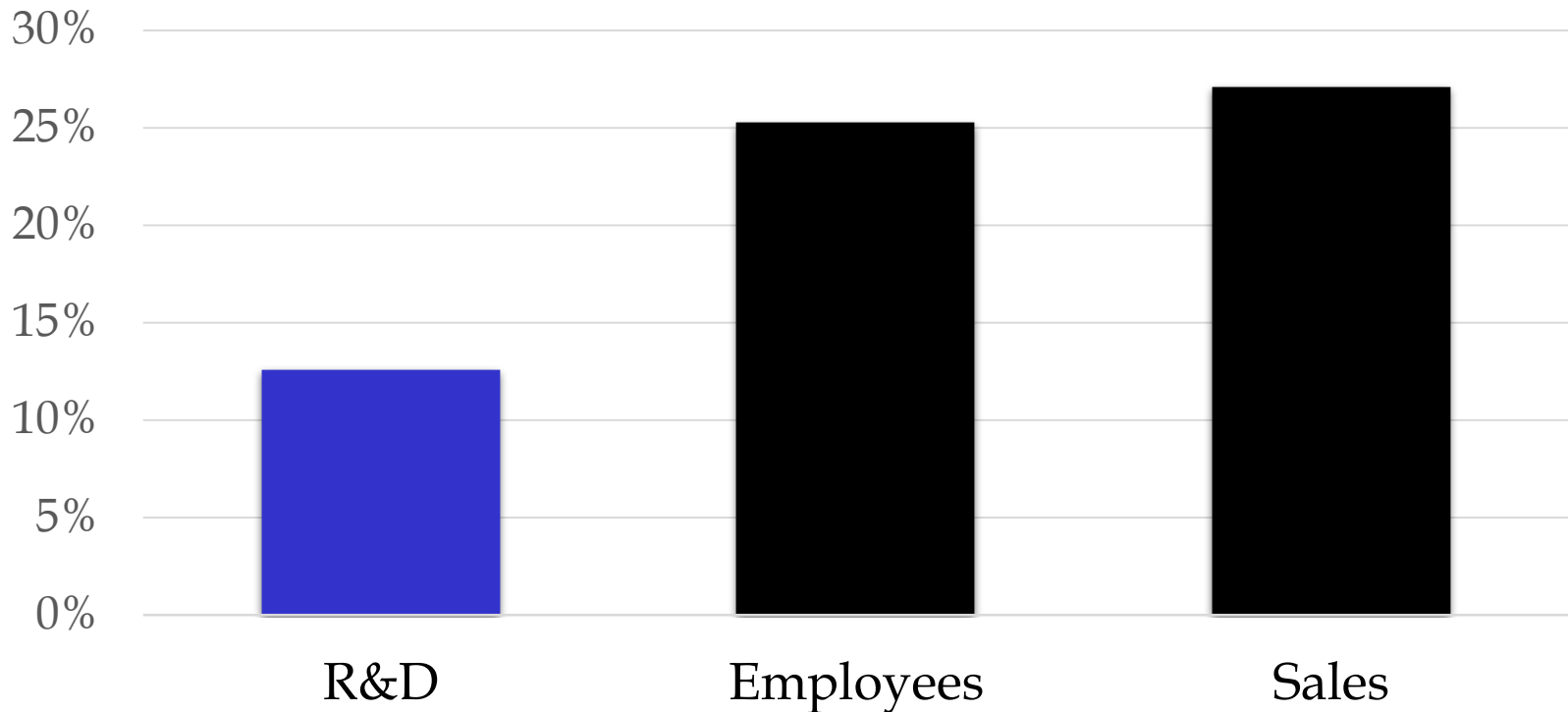
- US MNCs have developed an innovation system that spans the globe
- The need for IT/software human capital has driven some of the surge in and location choice of foreign R&D
- Evidence suggestive of a global division of labor, where activities are located in regions where production is most efficient
- Foreign talent could power an acceleration in the rate of productivity growth
- Deglobalization could inhibit the productivity benefits that R&D globalization could bring

THANK YOU

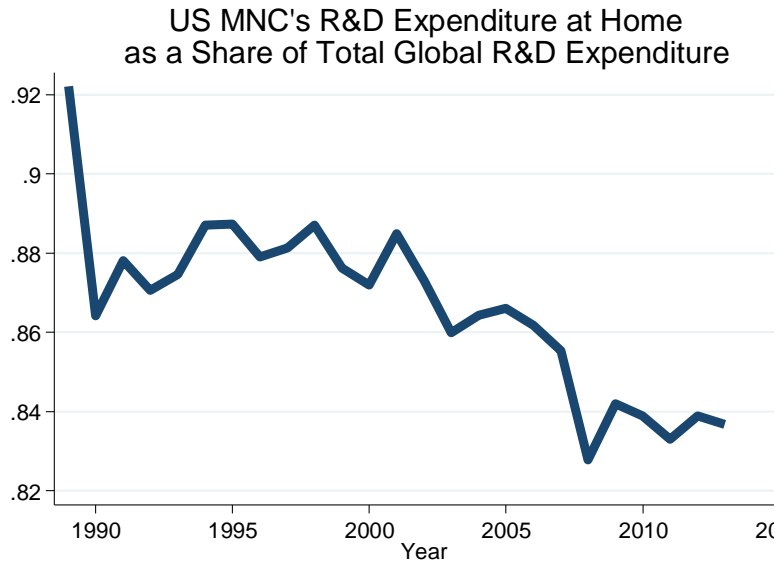
BACKUP SLIDES

R&D has always been much more highly concentrated in the home country than other activities of the firm

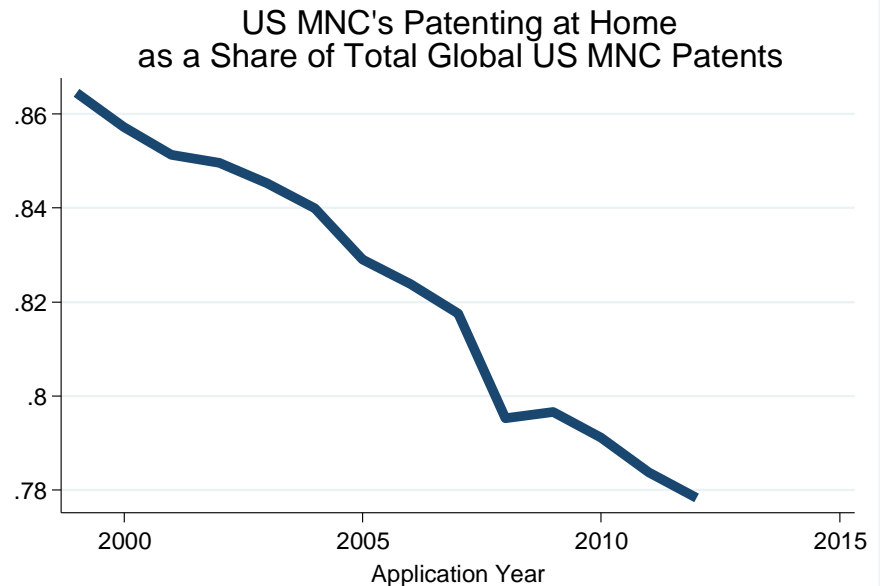
Foreign Affiliate Activity as a Share of US MNC Global Activity in 1999



The US parent continues to be the core of US MNC innovative activity, but foreign activity is steadily becoming more important



Source: Bureau of Economic Analysis



Source: Bureau of Economic Analysis & USPTO

Note: Foreign patents defined by having at least one foreign inventor on the patent