AI Diffusion Within Multinationals

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Extended Abstract — NBER Conference on Firms, Technology, and Economic Implications[1]

1) Background

Multinational enterprises are the main drivers of global production and technology investment (Bloom, Sadun and Van Reenen, 2012). However, little is known about how new technologies spread within these organizations. This paper asks where MNEs first adopt artificial intelligence, how AI subsequently diffuses across establishments inside the enterprise, and what determines the pace and pattern of that internal diffusion. While a growing literature studies AI adoption across firms at the extensive margin, the within-firm margin remains largely unexplored. This gap matters for aggregate firm outcomes. If AI reaches only a few establishments even within adopting firms, slow internal diffusion may help explain why firm-level productivity gains have appeared modest, and how gains are distributed across countries.

A rapidly growing literature documents the drivers of AI adoption across firms, highlighting the role of scale, young firms, intangibles, and complementary digital assets (Cho et al., 2022; Calvino and Fontanelli, 2023; McElheran et al., 2024). A smaller body of work examines how earlier process technologies diffused within firms (Battisti and Stoneman, 2005; Cirera, Comin and Cruz, 2026), while research on multinationals emphasizes intra-firm knowledge flows and the barriers posed by cross-border communication and coordination costs (Criscuolo, Haskel and Slaughter, 2010; Bircan, Javorcik and Pauly, 2024). Finally, the literatures on knowledge spillovers and absorptive capacity stress the role of proximity to science and of firms' capacity to absorb external knowledge (Cohen and Levinthal, 1990; Jaffe, Trajtenberg and Henderson, 1993; Bergeaud et al., 2025). To our knowledge, no existing work brings these elements together to study how AI diffuses within multinational enterprises across countries.

2) Data and Stylized facts

We use the CI Technology Database (Spiceworks Ziff Davis, formerly Harte Hanks), which records establishment-level use of specific digital technologies, including AI and other advanced digital technologies. Our analysis draws on a balanced panel of roughly 30,000 MNEs and their establishments across 31 countries between 2016 and 2022. We geocode establishment addresses and combine them with OpenAlex bibliographic data on over 200 million scholarly works to measure each establishment's proximity to AI research institutions, using pre-sample (2000–2015) AI research to construct exposure measures.

We document that AI use is far more prevalent among MNEs than among domestic firms, but that within adopting MNEs diffusion is highly incomplete, with roughly 90 percent exhibiting only partial adoption across plants in 2022. Adoption is typically piloted i.e. a small number of establishments adopt in the MNE's first adoption year. AI nonetheless diffuses internally over time.

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3) Analysis and findings

We first model which MNE establishments first adopt AI using a linear probability model with country-by-sector fixed effects and a rich set of establishment-level controls. First adopters are establishments located close to AI science and those with pre-existing complementary technologies the local density of AI research institutions within 50 km significantly predicts adoption, while prior ERP and cloud computing use raise adoption probability substantially. A multinomial logit on adoption timing shows that proximity to science matters only for early adopters, not late ones, and a placebo test using proximity to veterinary-medicine research confirms the AI-specific channel. We then study diffusion from early adopters to the rest of the enterprise, instrumenting peer establishments' adoption with peers' local AI research exposure. Initial instrumental-variable estimates suggest that both physical and technological distance help explain the sequence of adoption across establishments: those located nearer to prior adopters are more likely to adopt next, as are those with more similar technology profiles and digital capabilities (e.g., shared Cloud and ERP vendors).

4) Contribution

This is, to our knowledge, the first cross-country evidence on the within-firm diffusion of AI. The results highlight that AI spreads inside multinationals consistent with internal knowledge flows, and that complementary digital investments condition which establishments can absorb the technology. These findings speak to the micro-foundations of aggregate AI diffusion, the role of MNEs in international technology transfer, and why AI's productivity effects may materialize slowly and unevenly across establishments and countries.

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