

AI Deployment and Productivity

Why Productivity Diffusion Takes Time

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KEY MESSAGE

Generative AI capabilities are advancing rapidly, yet measurable productivity gains may diffuse more slowly across economies. A key bottleneck is not frontier AI access itself, but the organizational and deployment capabilities required to integrate AI into enterprise production systems. As firms devote substantial resources to deployment-related activities, part of the economic gains from AI may initially be absorbed by adaptation efforts—and the costs of these activities may be imperfectly measured, potentially obscuring the underlying productivity effects of AI deployment.

WHY THIS MATTERS

Generative AI capabilities are advancing rapidly, and many firms initially expanded enterprise AI experimentation through proof-of-concept (PoC) projects conducted under limited experimental conditions. In practice, however, many organizations are discovering that successful AI demonstrations do not automatically translate into scalable enterprise deployment. Measurable productivity gains have thus far appeared more limited and uneven than the pace of AI capability improvements might suggest. While [PRN2602](#) examined the long-run productivity and economic expansion potential of AI implementation and [PRN2610](#) discussed associated infrastructure constraints, a less-examined bottleneck may lie in the organizational frictions surrounding enterprise AI deployment and broader productivity diffusion—the focus of this note.

MECHANISM

Enterprise-scale AI deployment involves several distinct sources of organizational friction. Firms must frequently integrate AI systems into fragmented legacy infrastructure, cybersecurity and data governance requirements, regulated operational processes, and existing organizational workflows. Enterprise deployment may also require redesigning approval procedures, exception-handling protocols, monitoring systems, and human oversight mechanisms around AI-assisted decision-making.

As a result, scaling AI deployment often becomes highly service-intensive. Firms may devote substantial organizational and service resources to systems integration, workflow engineering, governance support, deployment teams, AI operations, and related consulting activities before AI use becomes standardized and scalable across the organization. In some cases, firms are also establishing specialized deployment-oriented functions—such as Forward Deployed Engineers (FDEs) and Enterprise AI Deployment (EAD) teams—that operate between frontier AI systems and enterprise production environments. These functions may increasingly support the accumulation of reusable organizational knowledge and implementation structures.

As deployment experience accumulates and becomes codified as organizational knowledge, implementation costs may gradually decline across subsequent deployments. Yet during the scaling phase itself, firms may still face rapidly rising deployment and organizational adjustment

costs, so that part of the economic gains from AI is initially absorbed by adaptation efforts rather than appearing as broad total factor productivity (TFP) improvements. Figure 1 summarizes the interaction between frontier AI progress, deployment frictions, and productivity diffusion.

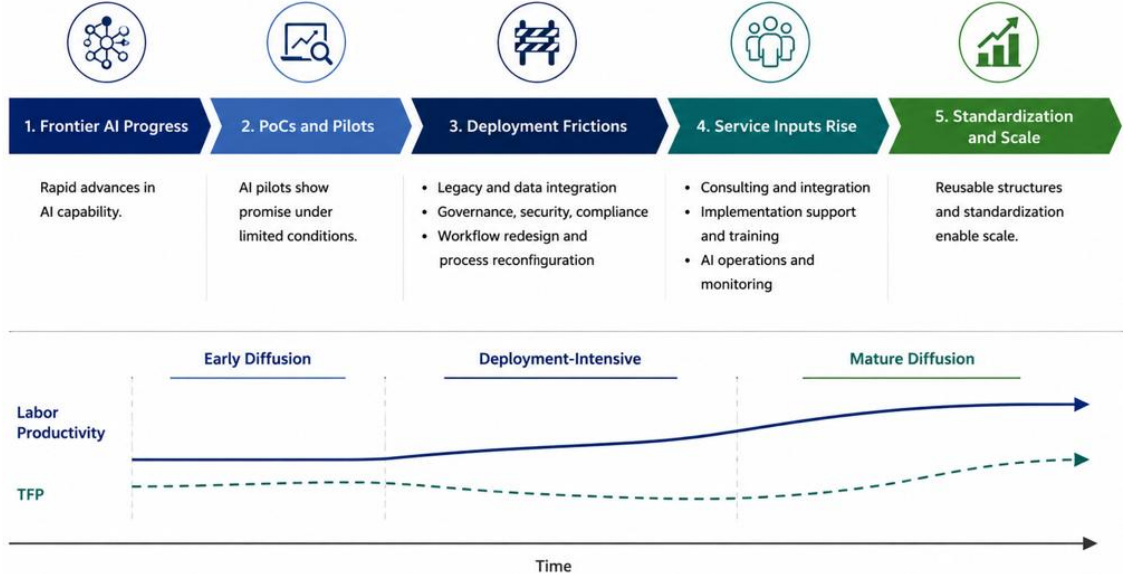


Figure 1. Stylized Mechanism of AI Deployment and Productivity Diffusion. Notes: Stylized mechanism linking frontier AI progress, enterprise deployment frictions, and delayed productivity diffusion.

AI adoption alone does not necessarily generate measurable productivity gains at the firm or aggregate level. In some cases, measurable productivity gains may emerge only gradually as firms expand business scale, redesign organizational structures, or reallocate resources around AI-enabled production systems rather than through immediate labor-saving alone.

MEASUREMENT CONSIDERATIONS

Measuring deployment-related organizational and service activities may become increasingly difficult. Many of these activities involve rapidly changing quality, firm-specific customization, and organizational adaptation that are not easily captured in observed prices or conventional input measures. If the costs and quality changes associated with such activities are imperfectly measured, real deployment-related inputs may be understated, potentially introducing an upward bias even into currently measured TFP growth during the AI diffusion process. Consequently, the gap between measured productivity performance and the underlying economic impact of AI may reflect not only gradual organizational learning and reusable deployment structures, but also growing measurement challenges associated with service-intensive and organizationally complex AI deployment processes.

IMPLICATIONS

<p>01 Enterprise AI deployment capability and organizational adaptation processes may increasingly function as firm-specific organizational capital.</p>	<p>02 Measured TFP gains during AI diffusion may partly reflect understated deployment-related organizational inputs and adaptation costs.</p>	<p>03 Cross-country productivity differences in the AI era may depend more on organizational adaptation and macroeconomic absorption capacity than on access to frontier AI alone.</p>
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This note is part of the Productivity Research Notes series, examining key issues in productivity and economic performance in Asia. The views expressed in this note are those of the authors and do not necessarily reflect those of their affiliated organizations. Inquiries may be directed to sankenoffice@info.keio.ac.jp.

