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Technology Adoption and Productivity: Evidence from UK SMEs

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Small and medium-sized enterprises (SMEs) account for about 99% of the UK business population and 60% of private sector employment. However, their productivity lags behind that of larger firms, which in turn generates a persistent drag on the overall economy. The introduction of innovative technologies has the potential to address this productivity gap. However, depending on the type of technology and how it is bundled, the productivity benefits could be substantial or provide only limited or no gains.

In this study, we utilise the latest waves of the Longitudinal Small Business Survey (2022–2023) to provide new empirical insights into how the adoption of six types of production-enhancing technologies (artificial intelligence, robotics, and automation (AIRA), Cloud Computing, business intelligence and analytics (BI), computer-aided design (CAD), Virtual/Augmented reality (VR/AR), and the Internet of Things (IoT)) influences the productivity of SMEs in the UK. Our results suggest that a targeted policy approach is necessary to encourage the use of specific high-impact technologies to improve productivity. This will also require considering the impact of technology adoption on productivity for SMEs facing structural challenges, such as those led by women, family-owned businesses, and minority-ethnic groups. If effective, such policy interventions would minimise regional and sectoral disparities in technological adoption and achieve higher productivity gains.

Key findings

A descriptive analysis reveals spatial and sectoral disparities in the adoption of digital technologies. SMEs based in England, particularly those in the business services industry sector, lead adoption, while those based in Wales, Scotland, Northern Ireland, and other industry sectors, such as retail, transport, and accommodation, lag behind.

The results of an exhaustive empirical analysis suggest that Business Intelligence and Analytics (BI) and Cloud Computing deliver the greatest productivity improvements, while adopting Computer-Aided Design (CAD) software results in moderate, but consistent gains. Artificial Intelligence, Robotics, and Automation (AIRA) have only marginally significant effects. This contrasts with the adoption of Internet of Things (IoT) and Virtual/Augmented Reality (VR/AR), which do not demonstrate significant productivity benefits.

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We also find that bundling multiple technologies does not routinely lead to higher productivity, with some combinations, such as VR/AR with AIRA or CAD, even reducing productivity returns. This is likely due to the complexity and inefficiencies of technological integration within the internal processes and production frameworks of SMEs.

Considering the effects of adopting technologies for certain types of SMEs, such as women-led, family-owned, and minority-ethnic-led SMEs, our results do not indicate productivity improvements, suggesting that deeper structural barriers limit the potential benefits of technology adoption for these firms. Larger, older, profitable SMEs with rapid growth ambitions are associated with the greatest productivity gains.

Policy and practice implications

Digital technologies offer significant opportunities to boost SME productivity, but the benefits vary across location, industry sector, and leadership characteristics. Our results emphasise the need for targeted policy interventions to enhance technology adoption among SMEs. Such intervention would prioritise financial and advisory support for high-impact tools such as business intelligence and analytics (BI) and cloud computing.

Tailored interventions, such as financial incentives, business support to integrate new technologies into daily operations, and staff training (especially for underserved SMEs, including women-led, family-owned, and minority-ethnic-led firms), would reduce barriers, improve digital skills, and unlock productivity gains.

Our findings suggest that a strategic and selective adoption of technology by SMEs is more likely to deliver greater productivity benefits than the random addition and bundling of advanced production-enhancing technologies.

Full paper link:

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