Economic and Social Research Council

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Policy Briefing

The impact of R&D and exporting on advanced technology adoption among UK SMEs

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Key findings

- **Dual engagement matters**: SMEs that both invest in R&D and export are **11 percentage points more likely** to adopt advanced and emerging technologies (AET)—including AI, automation, robotics, and VR/AR—than firms engaged in neither.
- **R&D is the main driver**: R&D activity is the strongest predictor of AET adoption. Exporting plays a **secondary role**, adding modest gains but not generating a synergistic effect when combined with R&D.
- **Timing is critical**: The strongest effects appear in **2022**, coinciding with the rapid diffusion of generative AI, suggesting dual firms are early adopters of frontier technologies.
- **Heterogeneity across firms**:
  - Effects are largest among **high-tech manufacturers, ICT firms, and knowledge-intensive services**.
  - **Smallest SMEs (2–3 employees)** and **larger SMEs (60–249 employees)** see the greatest gains.
  - Firms with **external strategic advice** or strong **growth ambitions** benefit most.
- **Exporting alone is not enough**: While exporters are slightly more likely to adopt AET, without R&D capability they lack the absorptive capacity to fully exploit new technologies.

Research Overviews

This study analyses **7,336 firm-year observations from the UK Longitudinal Small Business Survey (2018–2022).**

- **Method**: Propensity score weighting and a control function approach mitigate selection bias and endogeneity. Robustness checks use machine learning to generate a synthetic panel for difference-in-differences analysis.
- **Focus**: The paper asks whether dual engagement in R&D and exporting accelerates SME adoption of advanced and emerging technologies (AET), which are crucial for productivity and competitiveness.

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Policy implications

- **Prioritise SME R&D support**: R&D capability underpins firms' absorptive capacity. Expanding access to **R&D tax credits, collaborative grants, and innovation vouchers** is likely the most effective lever for technology adoption.
- **Target dual engagement strategically**: While exporting complements R&D, policy should avoid assuming automatic synergies. Instead, **link R&D support to internationalisation programmes** (e.g., UK Export Finance, trade missions) to build more globally competitive, innovation-ready SMEs.
- **Support capability building**: Firms benefiting most from dual engagement often seek external advice. Expanding **advisory and mentoring programmes** (e.g., Growth Hubs, Catapults, Made Smarter) could amplify technology uptake.
- **Focus on key sectors and firm types:**
    - High-tech manufacturing, ICT, and knowledge-intensive services should remain policy priorities.
    - Tailored support is needed for micro-SMEs with high growth potential as well as larger SMEs with scale-up ambitions.
- **Prepare for next-generation technologies**: Adoption effects peaked during the rollout of generative AI. UK policy must anticipate similar waves (quantum, biotech, advanced robotics) and ensure SMEs are positioned to lead rather than lag.

Full paper link:
http://enterpriseresearch.ac.uk/publications/erc-research-papers/

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