Digital and green transitions across enterprises: Do they go together? [1,2]

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INTRODUCTION

Digital and green transitions are major global trends and important policy objectives of governments around the world, as well as international organisations including the Organisation for Economic Co-operation and Development and the European Union. In Ireland, the twin green and digital transitions have been recognised as core components for transforming business models, driving productivity and sustainability, to progress a climate-neutral, sustainable, and digitally connected future. Understanding the factors that influence the adoption of digital technologies and linkages with sustainable business practices is important to inform policies aimed at fostering these twin transitions.

Against this background, this research paper generates new knowledge on linkages between the usage of digital technologies and the adoption of information and communication technologies (ICT)-related sustainability practices across firms, such as measures to reduce the energy consumption of ICT equipment and the amount of paper used for printing and copying, business sectors and regions.

DATA AND METHODS

The research used data on enterprises from 2020-2022 linked across a number of surveys provided by the Central Statistics Office of Ireland. The main data source is the e-commerce and ICT Survey 2021 and 2022. The 2022 wave of the ICT survey includes information on the following ICT-related sustainability measures adopted by firms[3] in Ireland: considering the environmental impact of ICT services or ICT equipment; measures to reduce the amount of paper used for printing and copying; measures to reduce the energy consumption of ICT equipment; disposal of or recycling of ICT equipment when it is no longer used; keeping ICT equipment

[1] This Bulletin summaries the findings from: Iulia Siedschlag, Gretta Mohan and Weijie Yan (2024). 'Twin transitions across enterprises: Do digital technologies and sustainability go together?', *Journal of Cleaner Production*. Available at: https://www.sciencedirect.com/science/article/pii/S0959652624034747?via%3Dihub

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[3] The survey was carried out on a representative sample of approx. 4,000 firms with 10 or more employed persons in the business sectors without agriculture, forestry and fishing; mining and quarrying; financial and insurance services.

within the firm (e.g. to be used as spare parts). These data were merged with information from four additional data sets including: information on the usage of digital technologies (Artificial Intelligence, Internet of Things, cloud computing services, software for sharing information electronically with the firm) collected with the e-commerce and ICT Survey 2021; balance sheet information (such as turnover, number of employees, wages, investment in capital assets) for 2020 available from the Census of Industrial Production and the Annual Services Inquiry; and information on the location and date of enterprise establishment available from the Business Register 2020. The final sample contains 846 firms with information over the period 2020–2022.

The empirical analysis combines descriptive statistics on the adoption of ICT-related sustainability measures across firms, sectors and space with multivariate econometric modelling that explains the propensity of firms to adopt these measures as a function of the usage of digital technologies, other firm internal factors (firm size, age, digital skills, investment in tangible and intangible assets, the speed of internet connection) as well as external factors (within industry competition, international engagement in international markets, industry-specific and region-specific effects).

RESULTS

The research results[4] indicate a substantial variation in the adoption of ICT-related sustainability measures across firms, business sectors and regions in Ireland in 2022. Large firms (with 250 and more employees) had the highest adoption rates across all ICT-related sustainability measures considered. The most adopted measure across all firms was disposing of or recycling ICT equipment (76% of all firms). One third of firms reported they kept ICT equipment within the firm when no longer used. Measures to reduce the energy consumption of ICT equipment were the least adopted (25 % of all firms).

The estimation results indicate that digitalisation is associated with a higher propensity of firms to adopt ICT-related sustainability measures, controlling for a range of factors including firm size, digital skills and investment in intangible assets.

POLICY IMPLICATIONS

Taken together, the results of this research indicate that the adoption of digital technologies and ICT-related sustainability practices are complementary strategic business objectives. To the extent that fostering the twin digital and green transitions is a key policy objective, this evidence suggests that targeted policy measures to incentivise and enable more firms, in particular small and medium-sized enterprises (SMEs), to adopt digital technologies and ICT-related sustainability measures could help to achieve this objective. The results also suggest that complementary measures to enhance other firm capabilities, including upskilling and employing ICT specialists, and investment in research and

[4] Results are based on the analysis of strictly controlled Research Micro-data Files provided by Ireland's Central Statistics Office (CSO). The CSO does not take any responsibility for the views expressed or the outputs generated from this research.

development and in other intangible assets, such as computer software and organisational capital should be part of the policy mix.