## Box 5: Potential impact of artificial intelligence on Ireland's labour market

Work has been underway in the Department of Finance (DFIN) and Department of Enterprise, Trade and Employment (DETE) on assessing the potential impacts of Artificial Intelligence (AI) on the Irish labour market. Utilising methodologies developed by Felten *et al*. (2021)^ and the IMF (Pizzinelli *et al*, 2023)^^, the research estimates Irish occupations' relative exposure to AI, and determines whether AI is likely to have a complementary or substitution effect on labour in those occupations. The research also assesses Ireland's overall labour market exposure to AI and how this varies across different demographic groups.

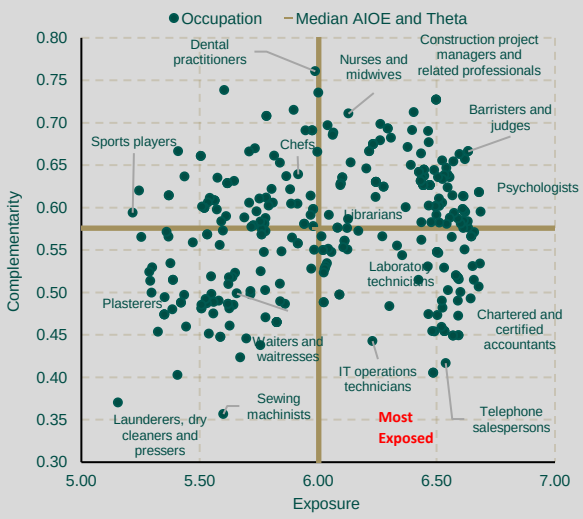
The analysis assesses each occupation included in the 2022 Census, assigning them to one of four categories: i) High Exposure, High Complementarity, ii) High Exposure, Low Complementarity, (iii) Low Exposure, High Complementarity; and (iv) Low Exposure, Low Complementarity. These are set out below (**figure 13A**), with each occupation plotted for AI occupational exposure (AIOE) and for AI potential complementarity (θ). The graph's quadrants are split using the median values of both exposure and complementarity – accordingly, the total number of occupations is split equally between the four quadrants. Results should be interpreted with this in mind.

The bottom right quadrant can be viewed as reflecting an 'at risk' area, where occupations are relatively more exposed *and* substitutable to AI applications. It is important to note that occupations in this category will not necessarily be substituted or transformed by AI, just that the current understanding of AI applications indicates that these occupations are most at risk, relative to other occupations. By contrast, the top right quadrant can be seen as a 'high potential benefit' area, where occupations are highly exposed to AI and where workers are most likely to be able to integrate AI applications into their jobs in a complementary way – increasing productivity.

Research by the IMF^^^ (Cazzaniga *et al*, 2024) found that, on average, 60 per cent of employment in advanced economies is highly exposed to AI. Analysis by DFIN (forthcoming) finds that Ireland's labour market is marginally more exposed to AI, at 63 per cent, although Ireland also has a higher-than-average share of persons working in highly complementary roles.

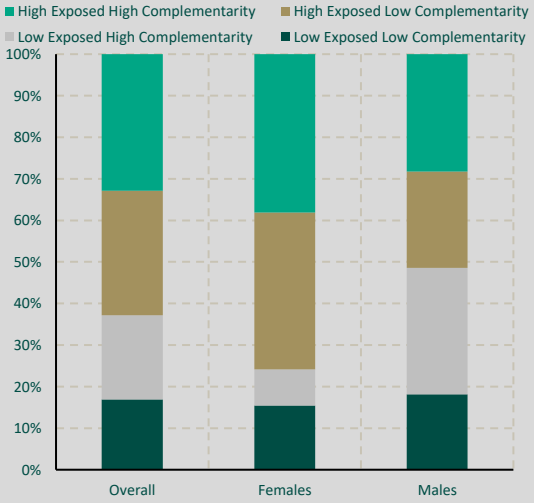
### Figure 13: AI Exposure and Complementarity

A: AI exposure and potential complementarity for Ireland




Source: Department of Finance (adapted from Pizzinelli et al, 2023)

B: Employment shares by gender




Source: Department of Finance

In addition, the analysis captures how employment shares differ between males and females (**figure 13B**). Females are far more likely to work in highly exposed roles compared to males (76 vs 51 per cent), including in roles that are considered to be most at risk of AI disruption (38 vs 23 per cent). Females greater labour market exposure to AI is a result of relatively higher levels of employment in highly exposed occupations such as customer service or administration. Males are more likely to work in roles in the agricultural or construction sector which are typically less exposed (further analysis of these trends, including detailed breakdowns by age, educational attainment, citizenship, region, and income decile, will be provided in the forthcoming research paper).

^ Felten et al. 2021. Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses, available at: https://doi.org/10.1002/smj.3286

^^ Pizzinelli et al. 2023. Labor Market Exposure to AI: Cross-country Differences and Distributional Implications, available at: https://www.imf.org/en/Publications/WP/Issues/2023/10/04/Labor-Market-Exposure-to-AI-Cross-country-Differences-and-Distributional-Implications-539656

^^^ Cazzaniga et al. 2024. Gen-AI: Artificial Intelligence and the Future of Work, available at: https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379