Online Appendix

AI Innovation and Labor Market Polarization: Evidence from European Regions

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This appendix presents additional placebo evidence based on ICT patenting activity. The analysis replicates the baseline event-study specification, replacing the regional introduction of AI patents with the regional introduction of ICT patents. This exercise helps assess whether the baseline results capture the specific effects of AI innovation or, instead, reflect broader digitalization trends.

Figure A1 reports the placebo results for the full sample of regions. The wage-cost ratio does not display a clear post-treatment decline and remains close to zero after the ICT event. Instead, the employment ratio turns positive in the post-treatment period. Overall, the full-sample placebo does not reproduce the negative response of relative labor costs and employment observed in the main AI analysis.

Fig. A1: Responses to ICT development, full sample

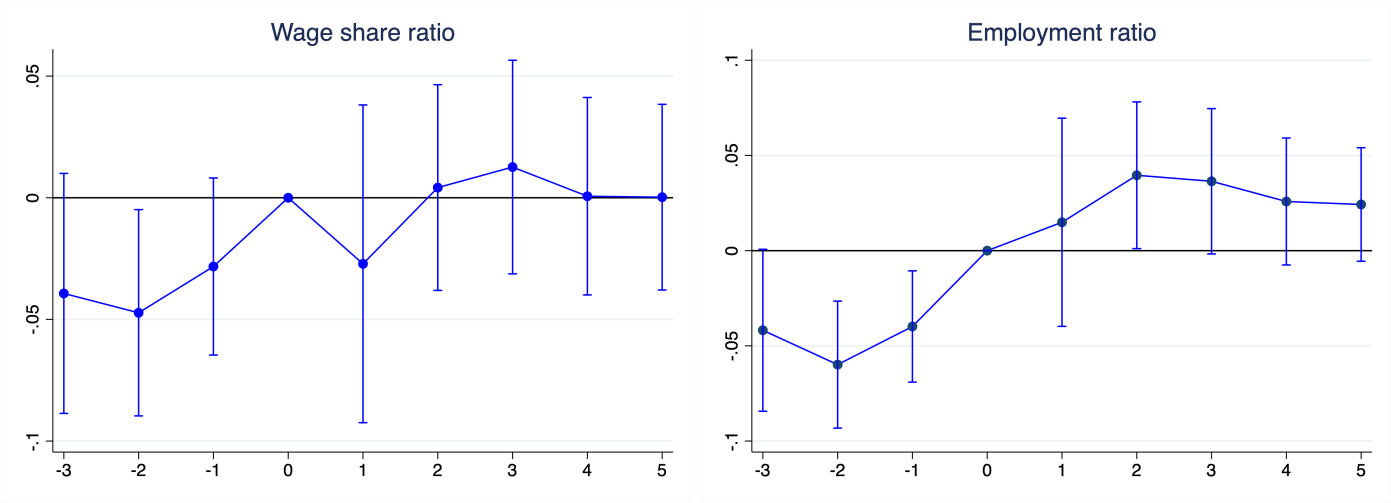

Figure A2 reports the same placebo exercise by countries' level of AI specialization. In AI-intensive countries, the post-treatment effects are not persistently negative, in contrast with the baseline AI results. Medium-AI countries display a positive response of both the wage-cost and employment ratios, while low-AI countries remain close to zero. This pattern is consistent with the interpretation that ICT captures an earlier wave of digitalization that was more complementary to high-skilled labor, whereas AI has distinct effects in economies where AI capabilities are sufficiently mature to substitute for cognitive tasks. Overall, the placebo evidence supports the view that the main results are not simply driven by broader digitalization trends.
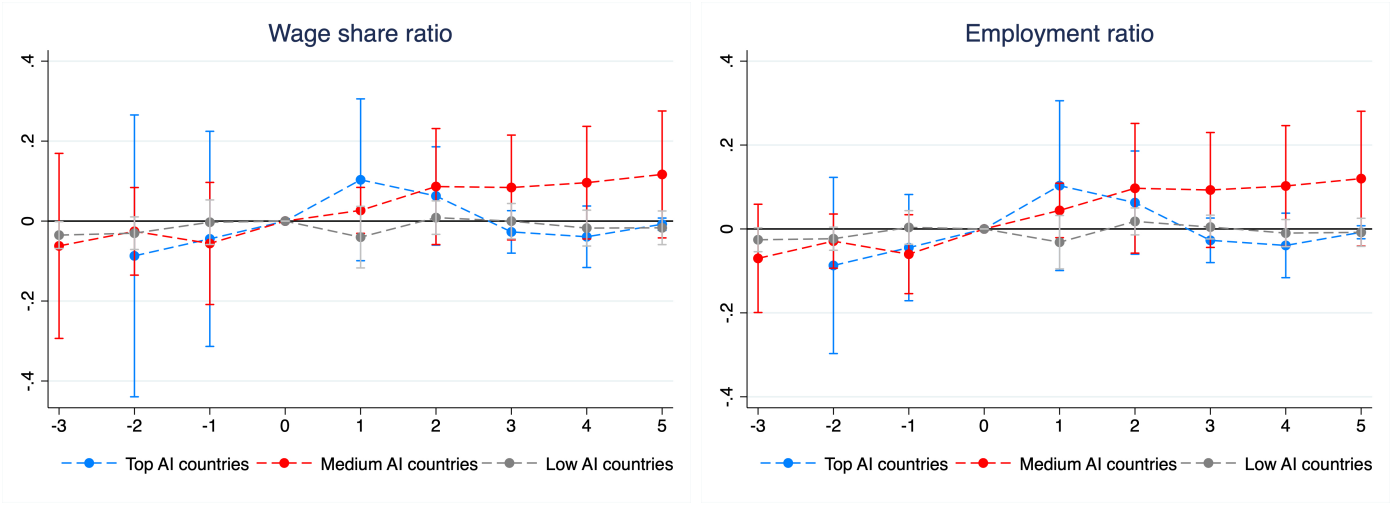
Fig. A2: Responses to ICT development by AI specialization