

Artificial Intelligence Widens Regional Divides and Squeezes Workers' Share of Income

Evidence from AI patenting and the functional distribution of income across 273 European regions, 2000–2017

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The Issue

Artificial Intelligence (AI) is increasingly a distributional policy challenge. If the gains from AI accrue disproportionately to capital owners while the labor share declines, workers may benefit less from productivity improvements than in earlier phases of technological change. This matters especially because AI development is concentrated in some regions, raising the risk that already prosperous innovation hubs pull further ahead while other regions fall behind. The key policy issue is therefore how governments can support AI-driven innovation while ensuring that its economic benefits are broadly shared across workers, skill groups, and regions.

KEY FINDINGS

- **AI depresses the labour share:** A doubling of regional AI innovation reduces the labour share by 0.5%–1.6% (0.09–0.31 pp from a mean of around 52%).
- **Educated workers most exposed:** AI-driven declines fall disproportionately on medium- and high-skilled workers, not on low-skill workers as commonly assumed.
- **AI widens regional gaps:** Innovation concentrates in a few hubs; most of southern and eastern Europe lags far behind.
- **Effect is distinct from ICT and R&D:** The negative AI channel on the labour share persists after controlling for other forms of technological change.

What We Did

We built a regional dataset for 273 European NUTS2 regions (including the UK) over 2000–2017, linking AI patent stocks from the OECD EPO Regpat database to regional accounts on labour compensation, value added, and employment. Skill-specific labour shares are constructed by education group.

We estimated a dynamic panel model with region and year fixed effects and a rich set of controls—productivity, capital, R&D, ICT, structural change, and spatial dependence—across 4,452 observations from 262 regions.

What We Found

Across all specifications, AI innovation is associated with a statistically and economically significant decline in the labour share. For every doubling of regional AI patent stocks, the labour share falls by 0.5% to 1.6%—potentially reducing it by 0.09 to 0.31 percentage points from an average of around 52%.

These results survive controls for ICT patenting, R&D capital, and other technological change, indicating that AI exerts a distinct distributional effect beyond general technological progress. While the empirical design controls for many confounders, the estimates are best interpreted as descriptive rather than fully causal.

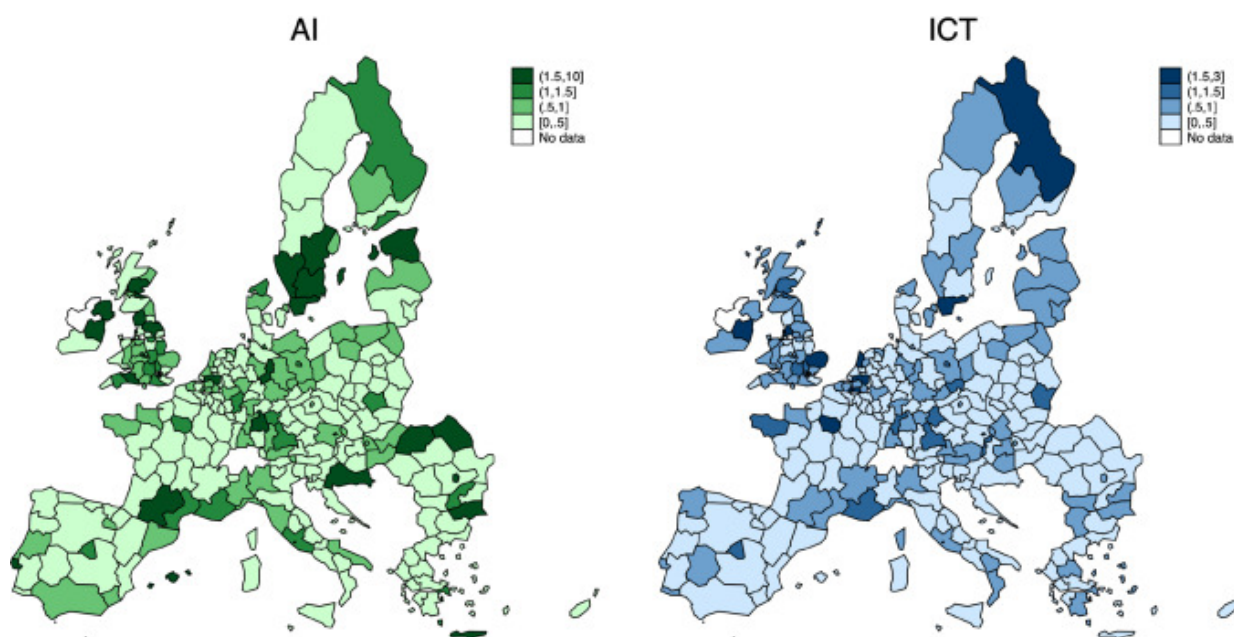


Figure 1: Regional AI and ICT patent stocks across European NUTS2 regions (average, 2000–2017). Darker shading indicates higher innovation intensity. AI innovation is concentrated in a handful of leading hubs while most of southern and eastern Europe lags significantly behind. Source: Minniti, Prettnner & Venturini (2025).

Who Is Most Affected?

Contrary to conventional wisdom, it is medium- and high-skilled workers—not low-skilled workers—who face the largest AI-driven labour share declines. This reflects AI's growing ability to substitute for cognitive and analytical tasks traditionally performed by educated workers, eroding their bargaining power. This spatial concentration of AI innovation risks amplifying existing inequalities, as productivity gains accrue primarily where innovation already flourishes.

Policy Implications

1. Ensure Workers Share in AI Gains

Where AI raises productivity while depressing wages, broadening capital ownership can help. Concrete measures include profit-sharing arrangements, expanded earned-income tax credits, and subsidised saving in diversified equity funds or social-dividend schemes.

2. Protect High- and Medium-Skilled Workers

Formal education alone does not shield workers from AI-related wage pressure. Governments should combine targeted education support—stipends, tuition waivers, housing support—with job-retraining programmes and curricula that emphasise skills complementary to AI.

3. Bridge the Regional AI Divide

Because AI innovation is geographically concentrated, lagging regions risk falling further behind. Regional policy should invest in digital infrastructure, local research capacity, AI-related training institutions, and technology-transfer programmes that help firms outside leading hubs adopt AI productively.

4. Reform Revenue Bases for Welfare States

A declining labour share erodes the traditional labour-tax base. Governments should consider revenue sources less dependent on labour income—land taxes, environmental levies, digital-presence taxes, or progressive consumption elements—to finance social expenditure without further burdening workers.

References

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