Artificial Intelligence (AI) and Spatial Sorting

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Abstract :
Artificial intelligence (AI) affects cognitive tasks performed by skilled labor, potentially altering the skill-biased productivity advantages of large cities and spatial sorting. In this paper, we quantify the aggregate and distributional effects of AI-induced spatial sorting using a spatial equilibrium model with heterogeneous labor. We measure AI capital by isolating variation in firm-level software assets induced by shocks to public AI R&D grants in China. Our structural estimates indicate that AI is a relative substitute for skilled labor and a relative complement to unskilled labor. Counterfactual analyses show that AI automation overturns canonical spatial sorting of skilled labor, with the skill ratio and skill premium declining most in large cities. We also find that AI automation increases aggregate productivity but lowers the welfare of skilled workers. The key mechanism is the interaction between local agglomeration forces and AI-driven relocation of unskilled labor toward large cities.