

Title: Data Centers as the Critical Urban Infrastructure in the AI Era: Evaluating Economic Impacts in US Metropolitan Areas

Data centers have become essential urban infrastructure in the era of digital and artificial intelligence (AI) transformation, yet systematic assessments of their urban and regional economic impacts remain limited. Existing policy discussions tend to focus narrowly on burdens related to land, energy, and grid capacity, rather than the economic implications of data centers. Even if they do not generate large-scale direct employment, data centers have substantial potential to function as foundational infrastructure that triggers indirect and structural industrial effects.

This study aims to empirically identify the ways in which data centers influence the growth of high-income jobs and high-tech industries. We used the Data Center KnowledgeBase provided by S&P Global 451 Research, containing information on the location, history, and facility characteristics of data centers across the US. The analysis focuses on the period 2010–2024 and employs US metropolitan statistical areas as the unit of analysis. To estimate the economic effects of data center development within urban areas, we apply the synthetic difference-in-differences method. We used growth in AI-exposed high-tech jobs and increases in related start-up activity as the key outcome variables.

Preliminary findings indicate that while the direct employment effects of data centers are very limited, regions with strong productivity and technological capacity experience significant gains in job upgrading and digital specialization. Conversely, regions with weaker human-capital foundations show little evidence of spillover effects, suggesting that the digital economy may exacerbate existing spatial inequalities. The estimated effects emerge within a few years of data center entry and are concentrated in AI-exposed and knowledge-intensive sectors. These patterns indicate that digital infrastructure tends to reinforce pre-existing regional advantages rather than produce economy-wide local spillovers.

Our findings challenge the conventional view of data centers as resource-heavy, low-value land uses. Instead, we argue that when paired with the right regional conditions, these centers serve as vital catalysts for AI-driven urban growth and industrial transformation. Therefore, regional planning should shift its focus from the binary choice of hosting to the strategic alignment of complementary innovation assets. Without these supporting capacities, digital infrastructure risks exacerbating spatial disparities rather than fostering balanced development.

Keywords (Max. 5): Data centers, digital infrastructure, regional economic development