

Locating Public Facilities: Theory and Micro Evidence from Paris

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Abstract

This paper investigates the problem of the optimal location of public facilities. I develop a quantifiable model in which the central planner decides on a location strategy, which includes the geographical location, as well as the overall number and capacity of public facilities, while anticipating how individuals and firms will react. The central planner's objective is to maximize aggregate welfare while minimizing the sum of fixed and variable facility costs. I prove the existence of an equilibrium for any given set of facility locations, and derive the optimal location strategy. The model remains tractable thanks to the use of stochastic shocks to commuting decisions which yield a gravity equation for commuter flows. I calibrate the model to fit the economic and geographic characteristics of Paris' metropolitan area at a 1km \times 1km geographic resolution and focus on secondary schools as an example of public facilities. The counterfactual analysis, which compares the optimal and the observed location strategy, suggests that the location decisions made in the period 2001-2015 were far from optimal. Important welfare gains could be enjoyed by better accounting for the general equilibrium effects on commutes, housing prices, wages, and amenities. Adopting the optimal location strategy increases aggregate welfare by about 1% already in the year of adoption.

Keywords: Public facility location, agglomeration, Weiszfeld method, commuting, gravity.

JEL classification: H11; R53; R41.

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