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# Price competition on graphs<sup>☆</sup>

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## Abstract

This paper extends Hotelling's model of price competition with quadratic transportation costs from a line to graphs. We derive an algorithm to calculate firm-level demand for any given graph, conditional on prices and firm locations. These graph models of price competition may lead to spatial discontinuities in firm-level demand. We show that the existence result of d'Aspremont et al. (1979) does not extend to graphs that cannot be reduced to a line or circle.

*Keywords:* spatial competition, Hotelling, graphs

*JEL:* D43, L10, R12

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## 1. Introduction

Firms face two opposing incentives in the decision where to locate relative to competitors. A location close to one's competitors maximizes the opportunities to capture one's competitors' consumers, but at the same time, little

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