

# Agglomeration and Innovation: Across Industries and Geographical Scales



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### Introduction

This research compares the effect of agglomeration on innovation across 34 groups of interrelated industries as defined by Delgado, Porter, and Stern (2014) and searches for their optimal spatial scales that maximize such effect.

Focusing on the state of Maryland, 2004-2013, I find that • The effect of agglomeration on innovation varies significantly • Search for the optimal geographical scale of agglomeration to maximize its effect on innovation



- across industries.
- The optimal scale of agglomeration is one mile in radius for most industries.

### Data

Match two datasets for the state of Maryland, 2004-2013:

- 1.5m establishment data from Quarterly Census of  $\bullet$ Employment and Wages
- 10,355 Patent data (with citation) from United States Patent  $\bullet$ and Trademark Office

A firm is defined as locating in agglomerations if employment density in related industries is above median in a buffer around this firm.



#### Effect on innovation (%) Optimal scale -10 -5 20 (mile in radius) 15 10 Metalworking Technology Food Processing and Manufacturing Automotive Recreational and Small Electric Goods Education and Knowledge Creation Upstream Metal Manufacturing Information Technology and... Downstream Chemical Products Distribution and Electronic Commerce Production Technology and Heavy... Construction Products and Services Downstream Metal Products Wood Products Plastics Marketing, Design, and Publishing



Agglomerations in Education and Knowledge Creation Industries

## Methods

Estimate the effect of agglomeration on innovation with continuous quantile estimator (Combes et al., 2012)

True agglomeration effect Selection effect Probability density

Aerospace Vehicles and Defense Local Personal Services (Non-Medical) Local Health Services Local Household Goods and Services Hospitality and Tourism Financial Services Jewelry and Precious Metals Insurance Services Local Financial Services Business Services Performing Arts Local Logistical Services Local Retailing of Clothing and... Medical Devices Communications Equipment and... Biopharmaceuticals Local Utilities Lighting and Electrical Equipment Upstream Chemical Products

Discussion



- Face-to-face human interaction is what's important for innovation in agglomerations.
- Agglomerations do not encourage innovation in all industries.

![](_page_0_Picture_29.jpeg)

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Fang, L., Tian, C. Housing and Marital Matching: A Signaling Perspective. China Economic Review (Forthcoming). Fang, L., Li, P. & Song, S. China's Development Policies and City Size Distribution. Urban Studies, 2017, 54(12): 2818-2834. Knaap G., Avin, U., & Fang L. Driving and Compact Growth. Journal of the American Planning Association, 2017, 83(1): 32-35. Fang, L. Do Clusters Encourage Innovation? A Meta-Analysis. Journal of Planning Literature, 2015, 30(3): 239-260.