

Housing market detections

Citation for published version (APA):

Langen, M. (2019). *Housing market detections: externalities & images*. [Doctoral Thesis, Maastricht University]. ProefschriftMaken. <https://doi.org/10.26481/dis.20191219ml>

Document status and date:

Published: 01/01/2019

DOI:

[10.26481/dis.20191219ml](https://doi.org/10.26481/dis.20191219ml)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Chapter 7

Valorization

The motivation for this thesis originates in the desire to better understand the dynamics behind real estate markets. Why are some neighborhoods considered as attractive, while others are not? There are countless discussions how individual sites are affecting neighborhood values, but often these discussions are not based on scientific evidence. I analyzed three policy topics out of these discussions, contributing to the understanding of housing price determinants and the understanding around individual policy discussions: the cost of education, energy production and cannabis sales points.

Chapter 2 shows that there is no evidence of average and good schools affecting local housing markets. Consequentially, placing a school of high quality should not be used as a tool to increase neighborhood attractiveness. Furthermore, it is shown that external effects of schools are versatile and in proximity of worst performing schools negative externalities significantly outweigh positive and consequently decrease residential housing prices. The previous literature often neglects the distance between properties and schools, focusing on the position within or outside school district boundaries only.

Chapter 3 adds to the discussion on energy production. In recent years, many studies exploring the effects of wind turbines emerged. However, due to the heterogeneity in study areas, times and methods, they were not able to set the findings in relation to other energy sources. In this study, I cover all energy production facilities of a whole country over nearly 30 years. The results show that some energy production facilities have a positive effect on house prices, some a negative and some a negligible effect.

Chapter 4 focuses on the external effects of cannabis sales facilities. Due to a trend in wider acceptance of cannabis use and legalization, policy makers are confronted with a complex choice: where to locate cannabis sales facilities. Chapter 4 explores the spillover effects of such facilities in a market with long experience: the Netherlands. I find that house prices do not increase after cannabis sales facilities are exogenously closed down. Rather, I find that house prices decrease. Residents thus do not seem to experience cannabis sales facilities as a nuisance to their neighborhood.

Throughout the chapters I am constantly confronted with potential endogeneity problems. I therefore explore different methods to measure external effects. This thesis therefore also adds to the discussion on valuation model choices. Only by using difference-in-difference or repeated sales models we are able to establish causal relationships. However, these models require sufficient available data, which are often scarce.

The aforementioned data scarcity leads to the question how we can collect new data? Chapter 5 takes a step into the deep - by exploring future ways of using machine learning to help policymakers reflect on residential housing market decisions. The chapter tackles the bottlenecks of current housing studies, with methods from computer science. In a novel approach, I apply machine learning techniques to property images, estimating property characteristics. I examine the image quality of Google Street View for this purpose and show two example applications of the proposed method. This method has a wide array of possible usages, among the most promising is its application to data scarce settings - such as urbanization in low-income countries, or accurate tax assessments in these countries.