The Economic Impact of Farmers Markets on Property Values: Evidence from Edmonton, Canada

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Introduction

- The economic influence of farmers markets on local property values poses a nuanced challenge for urban planners and policymakers. While these markets are widely acknowledged for their positive aspects, such as enhancing access to fresh food, supporting local agriculture, and fostering community engagement, they also bring potential downsides. These may encompass heightened traffic, noise, pollution, and waste, which could adversely affect nearby property values.
- **Research Gap:** Existing research has predominantly centered on the impact of grocery stores on property values and food accessibility (Caceres and Geoghegan, 2017; Warsaw and Phaneuf, 2019). Nevertheless, farmers markets, distinguished by their unique operational characteristics and customer base, have not received comparable attention.
- **Main Objective:** Use spatial hedonic pricing models to examine how proximity to farmers markets influences property values and estimate people's willingness to pay for residing near farmers markets.

Conceptual Framework

- **Conceptual Framework:** Drawing on the conceptual framework inspired by the models of Li and Brown (1980) and Collins (2020), we propose that the valuation of properties in proximity to farmers markets is shaped by the dynamic interplay of positive and negative externalities (see Figure 1).
- **Hypothesis:** Our hypothesis posits that the willingness to pay for the benefits of farmers markets diminishes with increasing distance, while compensation for their adverse effects also decreases further away from these markets.

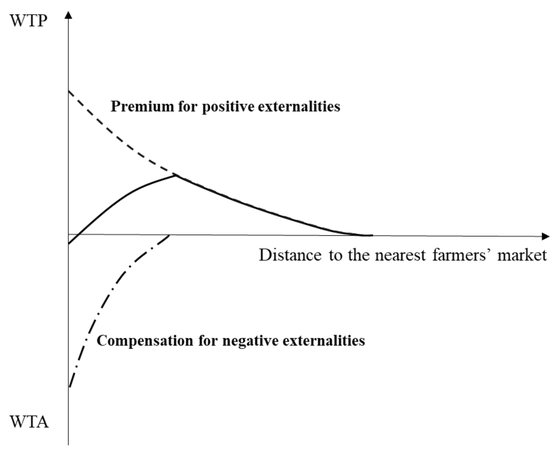

Figure 1. Conceptual Framework of the Relationship between People's WTP/WTA and Distance to Farmers Markets

Empirical Framework

- **Spatial lag model (SAR)**

$$lnP = \rho W lnP + FM\alpha_1 + FM^2\alpha_2 + S\beta_1 + L\beta_2 + N\beta_3 + \varepsilon$$

where P represents an $n \times 1$ vector of the housing prices. W is an $n \times n$ spatial weight matrix and ρ is the spatial autoregressive parameter. FM and FM^2 denote the distance to farmers markets and its square, and α_1 and α_2 are the corresponding coefficients. S, L and N are $n \times k$ vectors of house structural variables, locational variables, and neighborhood variables, β_1, β_2 and β_3 are $k \times 1$ vectors of estimated regression coefficient. ε is an $n \times 1$ vector of independent and identically distributed error terms.

- **Spatial weight matrix**

We consider two ways to define the weight matrix:
① Distance band weights: $d = 800m, 1000m$.
② K-nearest neighbor weights: $k = 20, 30$.

- **Measures of marginal effects**

$$ATE_{FM} = (1 - \rho^{-1})[\alpha_1 + 2\alpha_2 FM]$$

where ρ is the estimate of the spatial lag parameter. The average marginal effects of farmers markets on property values not only depend on the estimated coefficients α_1 and α_2, but also rely on the distance to farmers markets.

$$Total\ MWTP_{FM} = (1 - \rho)^{-1}[\alpha_1 + 2\alpha_2 FM]\bar{P}$$

where $\bar{P}$ represents the average house prices in our study area.

Data

- **Study area**
  - Edmonton, the capital city of Alberta, Canada.
  - Edmonton citizens have access to 18 farmers markets, 13 of which are located in the city area and the remaining five are located in the surrounding suburban communities.
- **Data and Variables**
  - The property transaction data for single-family residential properties comes mainly from RPS Real Property Solutions (www.rpsrealsolutions.com).
  - Farmers markets: obtained from Government of Alberta (2022)
  - Housing structural characteristics: including number of bedrooms, property conditions, garage capacity, etc., are extracted from RPS Real Property Solutions.
  - Locational Attributes: including shopping center, grocery store, downtown, University of Alberta, hospitals, and green space, extracted from DMTI Spatial Inc and the City of Edmonton Open Data Catalogue.
  - Neighborhood characteristics: including population density, unemployment rate, high education rate, etc., obtained from Edmonton Open Data Catalogue 2016 Census.

Results

Table 1 Regression Estimation Results

	OLS	Spatial lag models	
		800-meter W	Nearest 20 W
Farmers Market	0.0111***	0.0106***	0.0096**
Farmers market^2	-0.0009	-0.0011*	-0.0010*

- There is an inverted-U shaped relationship between proximity to farmers market and property. Specifically,
  - If the distance to the nearest farmers market was below a certain benchmark (4.60 km to 4.90 km), property values fell as the distance decreased;
  - If the distance to the nearest farmers market was above that benchmark, property values fell as the distance increased.

Table 2 Marginal WTP/WTA for Access to Farmers Markets

	800-meter W	Nearest 20 W
Lower Distance	5,808.79***	5,058.78**
Mean Distance	3,168.83***	2,724.72**
Higher Distance	528.86***	390.65**

- In terms of the corresponding WTP values, our estimates suggest that at the mean distance of 2.86 km, households were willing to pay C$2,724 for every one-kilometer increase in the distance to a farmers market.
- Households' marginal WTP for living further away from a farmers market decreased with their distance to the farmers market

Policy Implications

- Introducing new farmers markets to improve a neighborhood's food environment may lead to some unintended consequences.
- For neighborhoods with limited access to farmers markets, the local government can introduce new farmers markets or relocate the existing ones.
- To reduce the potential negative externalities associated with larger farmers markets, greater consideration should be given to improving the operation of farmers market and limiting the nuisance effects during market hours. This may include enhanced traffic control, expanded street and sidewalk cleaning services, and a greater police or security presence during market hours in the surrounding area.

Selected references

Warsaw, P., & Phaneuf, D. J. (2019). The implicit price of food access in an urban area: evidence from Milwaukee property markets. *Land Economics*, *95*(4), 515–530.

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