

Understanding the food retail landscape: Are corporate businesses killing small businesses in Mexico?

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INTRODUCTION

The food retail landscape in Mexico has undergone significant changes in recent years, with an increasing number of corporate businesses entering the market (Hawkes, 2006; Reardon et al., 2003). While these large companies have the advantage of economies of scale, smaller businesses continue being the predominant stores in Mexico (Farah et al., 2022; Pérez-Ferrer et al., 2020). This has raised questions about the impact of corporate businesses on the local economy, particularly on small businesses. This project seeks to explore the extent to which corporate businesses are affecting small businesses in Mexico and analyze the implications of this trend for the local economy.

DATA

The data was taken from the National Statistical Directory of Economic Units (DENUE), a database maintained by the National Institute of Statistics and Geography (INEGI) in Mexico. It provides comprehensive information on the characteristics of economic units, including their location, economic activity, and size of establishments. We specifically looked at food retail data in Mexico City and compared the change in data from 2010 to 2019.

However, the datasets are not longitudinal in nature with inaccurate location pinpointing for the same business spanning multiple years. In addition to mislabeled postal codes, there was little uniformity to street names across datasets. In order to clean the data, multiple strategies were used including fuzzy matching, intensive filtering, and rigorous mutations.

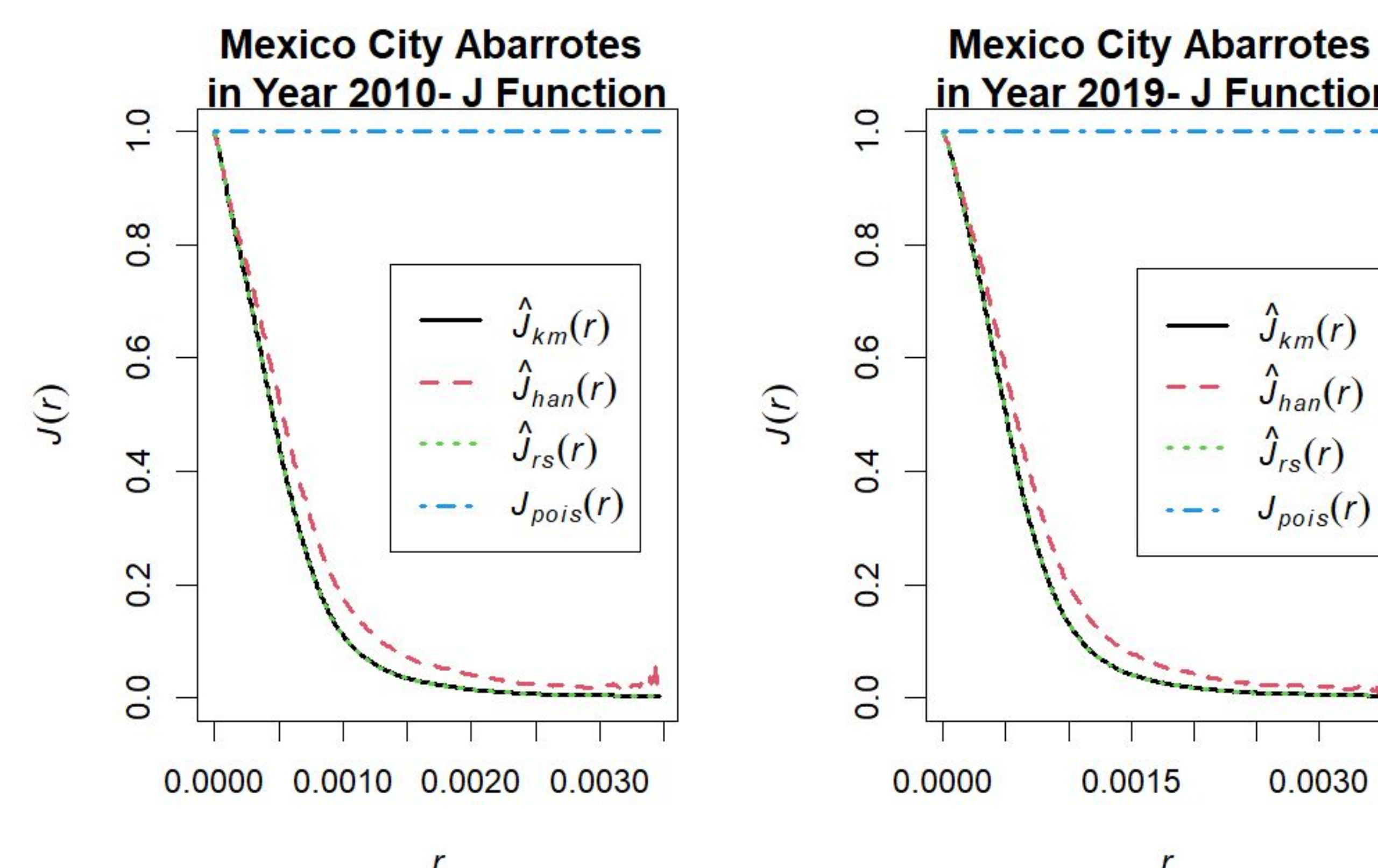
OBJECTIVES

The research objective of this project is to explore and analyze the 2010 and 2019 datasets by cleaning and organizing them, identifying the birth and death of businesses, and applying spatial point pattern analysis techniques to the cleaned data.

METHODS

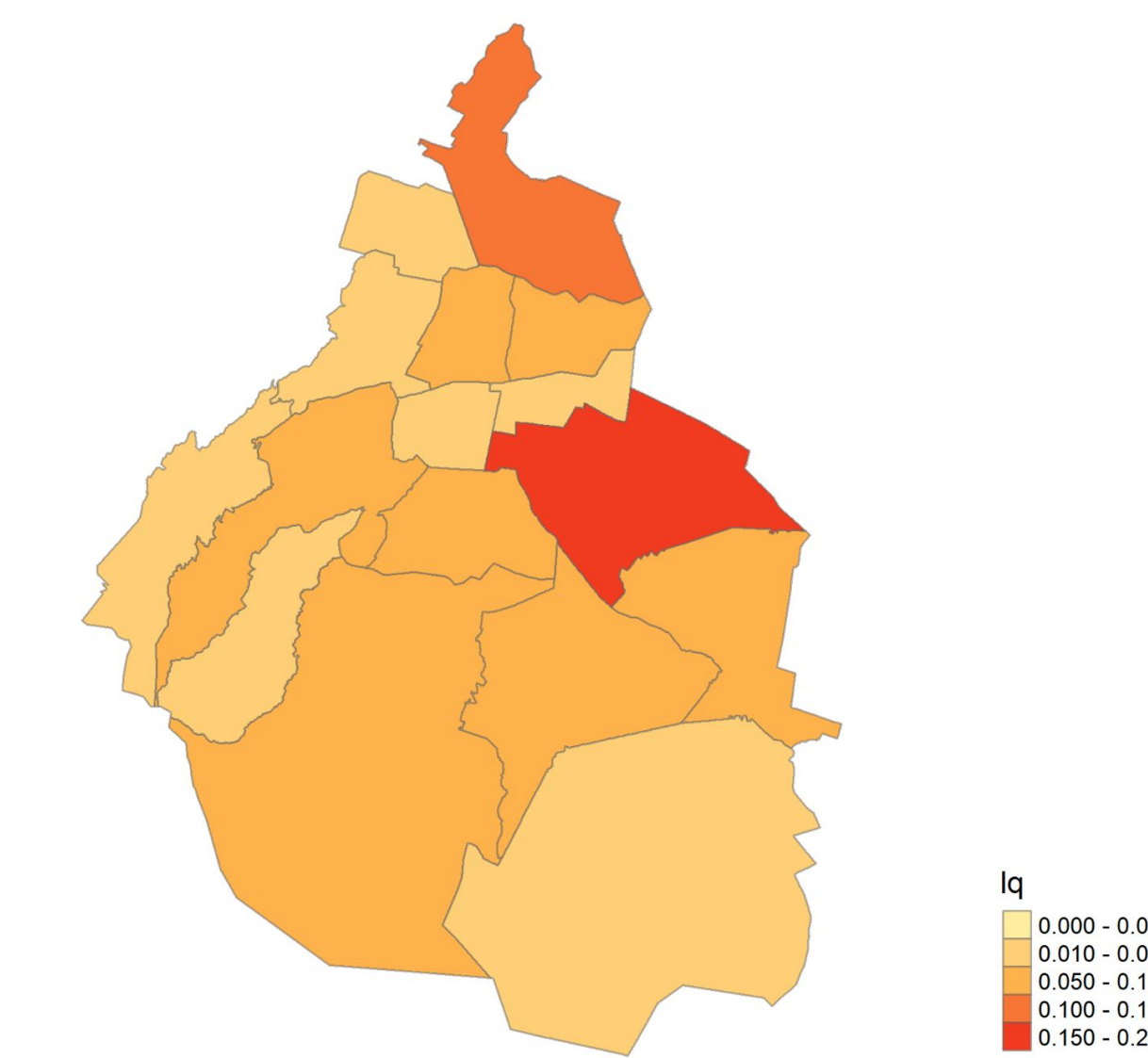
To clean the data, multiple R packages such as 'tidyverse' and 'dplyr' were utilized. Data accuracy was verified, removing duplicates and checking for essential information such as latitude, longitude, postal code, and store type code. A new column named "status" was added to indicate the store's existence in both 2010 and 2019. Four types of stores were grouped into traditional outlets (*abarrotes* (i.e., small neighborhood stores) and specialty stores) and modern outlets (supermarkets and convenience stores) categories. Their locations were mapped using packages including 'sp', 'spatstat', 'tmap', and 'sf'. From the clean data, the location quotient was calculated, and a choropleth map was created for each type of establishment in 2010 and 2019. The map colors were determined based on the location quotient values in different municipalities, facilitating comparisons between "births" and "deaths" of establishments. Furthermore, the G function, F function, and L function were used to analyze the clustering of stores in Mexico City by comparing the plots from the two years.

RESULTS & VISUALIZATIONS

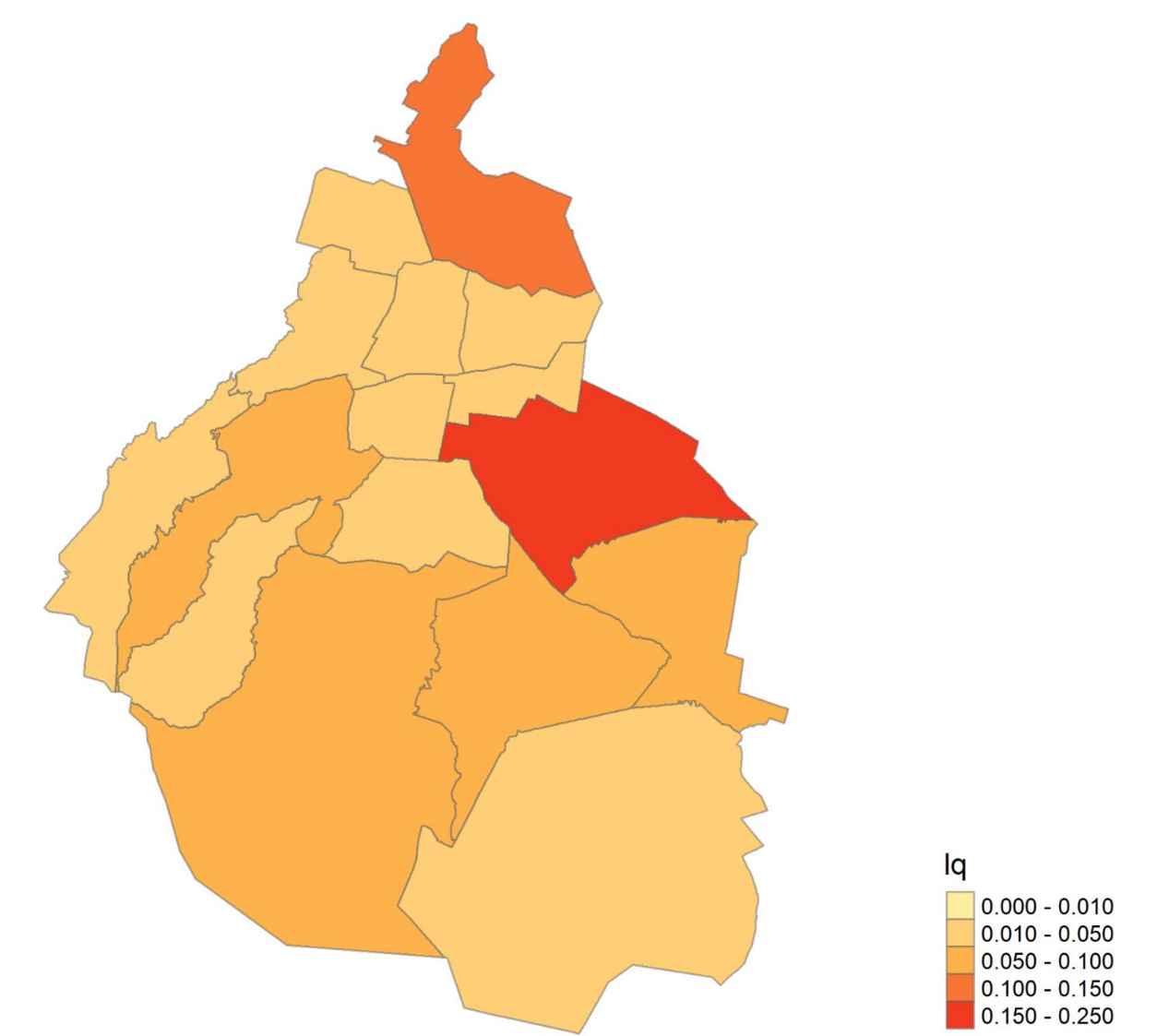


Note: The Jest function is a way to estimate the J function for a set of point patterns. The J function indicates whether the points in the pattern are more clustered or dispersed than expected under a random distribution.

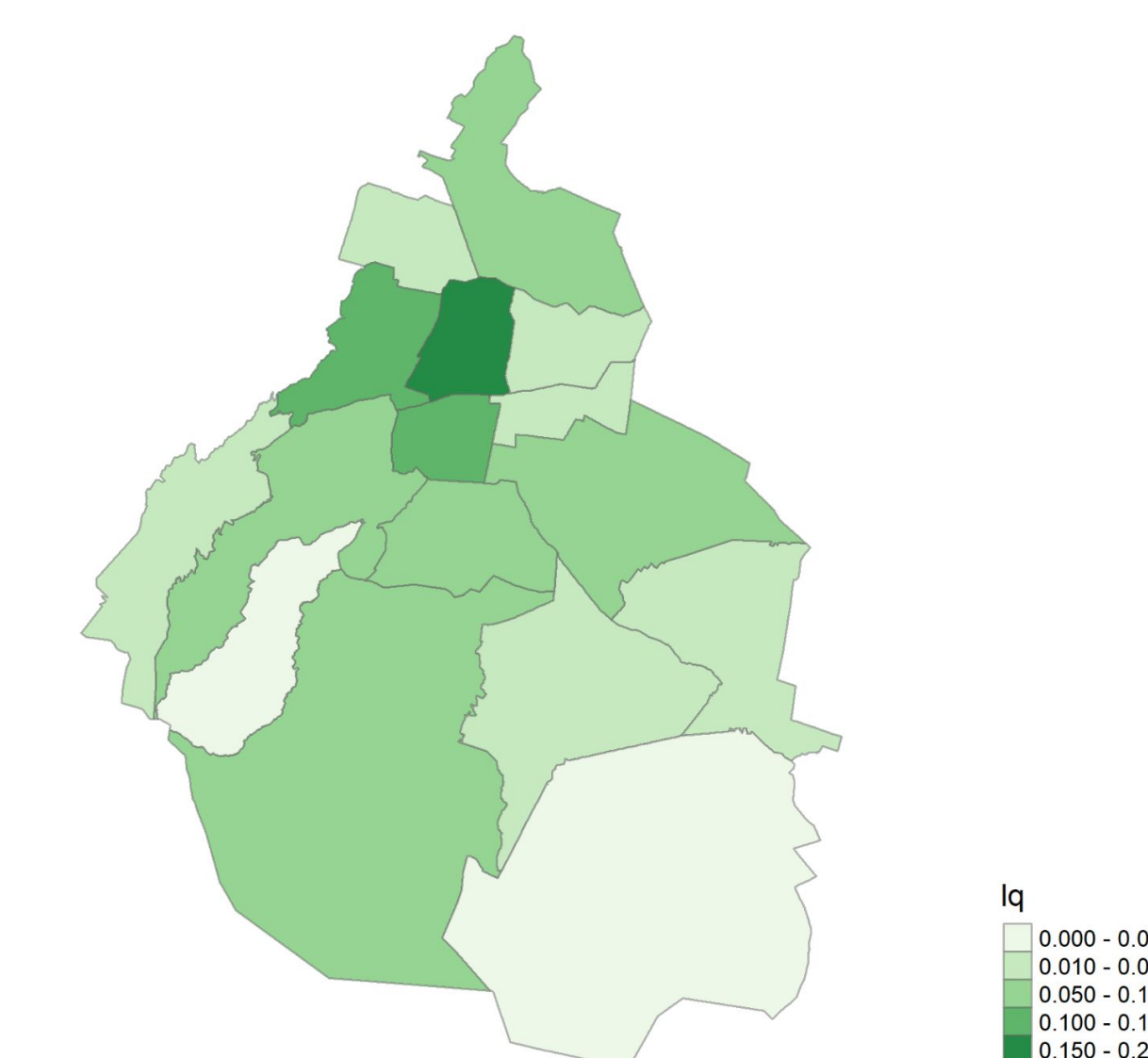
Distribution of Traditional Store with Location Quotient in 2010



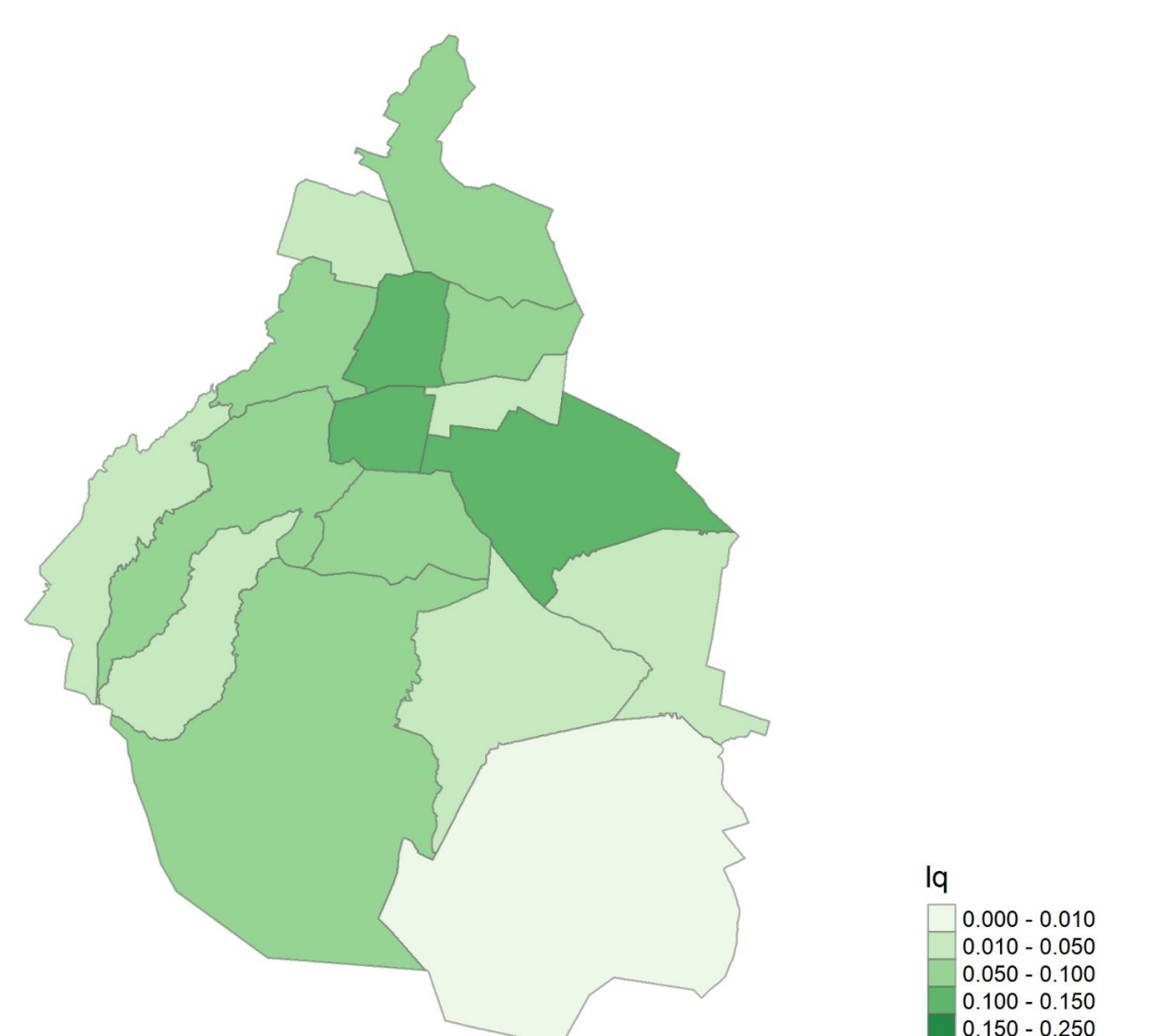
Distribution of Traditional Store with Location Quotient in 2019



Distribution of Modern Store with Location Quotient in 2010



Distribution of Modern Store with Location Quotient in 2019



CONCLUSION

The J function analysis suggests that the spatial clustering of traditional stores has changed to become more clustered over time. Through comparing the LQ values for modern and traditional stores in Mexico City between 2010 and 2019, three municipalities showed a more significant decrease in LQ values for traditional stores. Modern stores are mostly clustered in the northern part of the city, and there is a tendency to cluster from the northwest to the southeast.

REFERENCES

- Farah, Irene, Dalia Stern, Yenisei Ramirez, Nancy López-Olmedo, Carolina Pérez-Ferrer, Brent A. Langellier, M. Arantxa Colchero, and Tonatiuh Barrientos-Gutierrez. "Food and Beverage Purchases at Formal and Informal Outlets in Mexico." *Public Health Nutrition*, October 26, 2022, 1–28.
- Hawkes, Corinna. "Uneven Dietary Development: Linking the Policies and Processes of Globalization with the Nutrition Transition, Obesity and Diet-Related Chronic Diseases." *Globalization and Health* 2, no. 4 (March 2006): 1–16.
- Pérez-Ferrer, Carolina, Amy H. Auchincloss, Tonatiuh Barrientos-Gutierrez, M. Arantxa Colchero, Leticia de Oliveira Cardoso, Mariana Carvalho de Menezes, and Usama Bilal. "Longitudinal Changes in the Retail Food Environment in Mexico and Their Association with Diabetes." *Health and Place* 66 (November 2020).
- Reardon, Thomas, C Peter Timmer, Christopher B Barrett, and Julio Berdegue. "The Rise of Supermarkets in Africa, Asia, and Latin America." *American Journal of Agricultural Economics* 85, no. 5 (2003): 1140–46.