

Federal University of Pernambuco

The importance of environment in accessing credit

M.S. Felipe Resende Oliveira

Co-author: Ph.D. Tatiane Almeida de Menezes

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Microcredit loans are targeted to poor people or very poor people, characterized by an absolute lack of access to credit. In this concept, microcredit is characterized as a policy to combat poverty, and not only as a funding policy. (Yunus , 2000)

Motivation

- It is intended to improve aspects of lending, so that firms sponsoring microcredit and customers do not have prejudice.
- Ok, what's that mean?
- Be the case that the bank loses the loan principal and interest receivable, and the client, which is replaced loans with higher interest rates, since banks embody the costs of defaulting peoples, and with the powers permitted by law, for example, in the case of default by the customer enrollment at "SPC" Client Protection Service.

Motivation

- Ryan and Gross (1943) analyzes the adoption of hybrid maize. Lazarsfeld et al. (1944) analysis of how "by word of mouth" influence on the behavior of the voting process.
- Foster and Rosenweig (1995) and Conley and Udry (2010) research as diffusion occurs in the learning of technological development of agriculture process.
- Duflo et al. (2012) examines how the process of diffusion rushes in a microcredit program in 43 villages in South India. Noted that the actual participants of the program are four times more likely to transmit program information with your friends than non-participants, however, it is noteworthy that most people did not participate in the program, so the amount of information they convey also is significant, coming to represent a third of all the information on the microcredit program.

Motivation

- Valente e Davis (1999) reveals that the identification of key individual (leader) is crucial to the process of spreading an innovation.
- According Grossi (2013) a quarter of the Brazilian population is of micro entrepreneurs and that 70% of the income generated by small businesses circulates within the community in which they are located. Besides contributing to the entrepreneur himself, microcredit creates a virtuous cycle that provides benefits for all business around. For example, sales of a small grocery store, becomes the personal income of the entrepreneur, which in turn focuses most of its consumption in establishments of trade and services offered by other residents in the neighborhood and generates a cycle of local development.

Hypothesis

- Thus, the hypothesis is that microcredit borrowers can cluster within a region. In addition, loans with no success should be close to other loans. We want to check whether the occurrence of these events in a region is not a random phenomenon and that somehow the aspects of the environment affect the pattern of occurrence of these events.

Objective

- The present study aims to identify the role of the environment where people have their business on access to microcredit and their ability to pay.

Data set

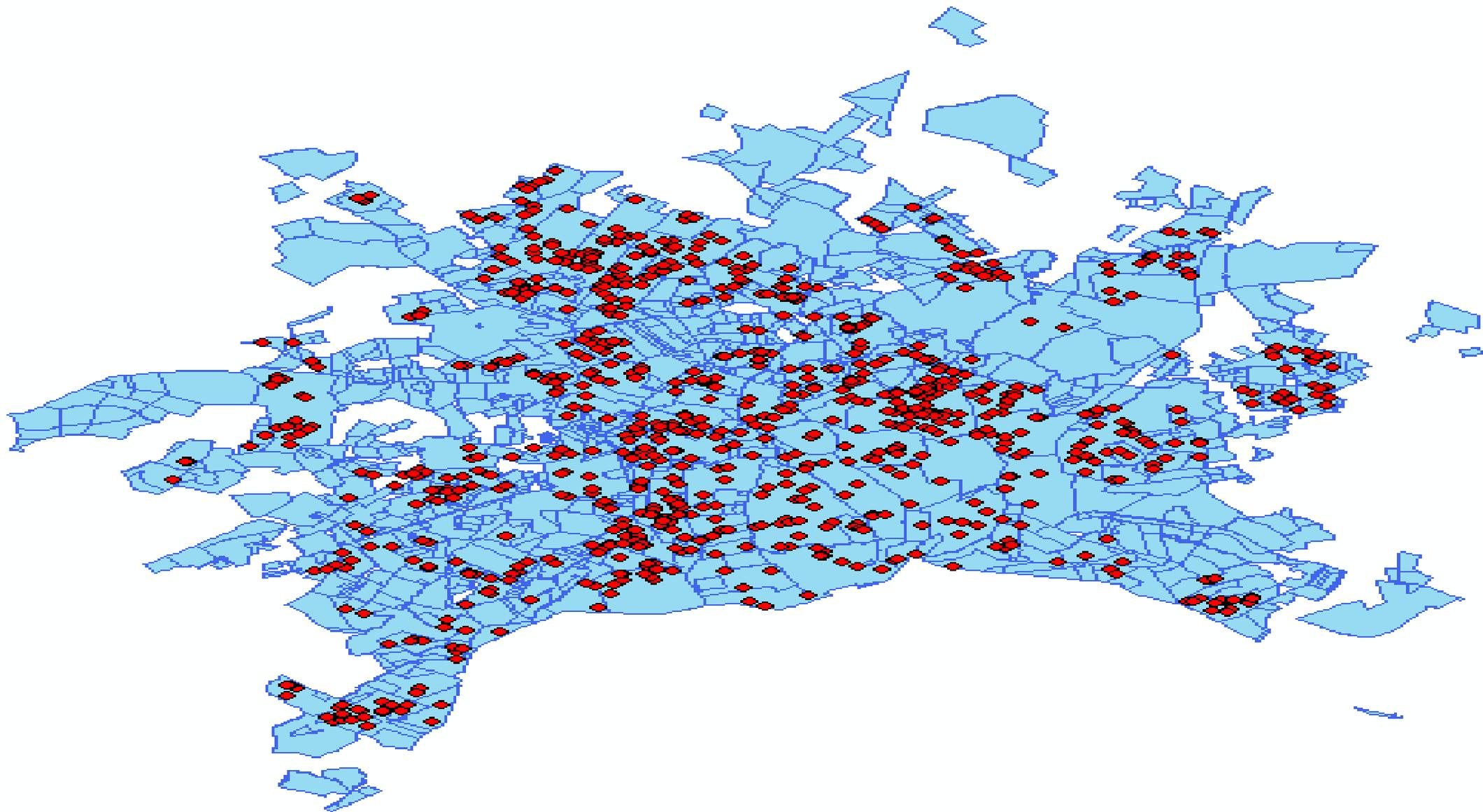
- The database used is obtained from the register of the People's Bank of Goiania on the 1st of January 2005 to December 8, 2010.
- 872 clients and 1217 loans.
- Customers are considered delinquent when they delay their debt from 30 days or more.
 - we have 756 entrepreneurs honoring debt and 116 in default, but when considered delinquent customers who delay their payments by more than 90 days to the study base is constituted 779 entrepreneurs classified as performing and 93 classified as delinquent.

Data Set

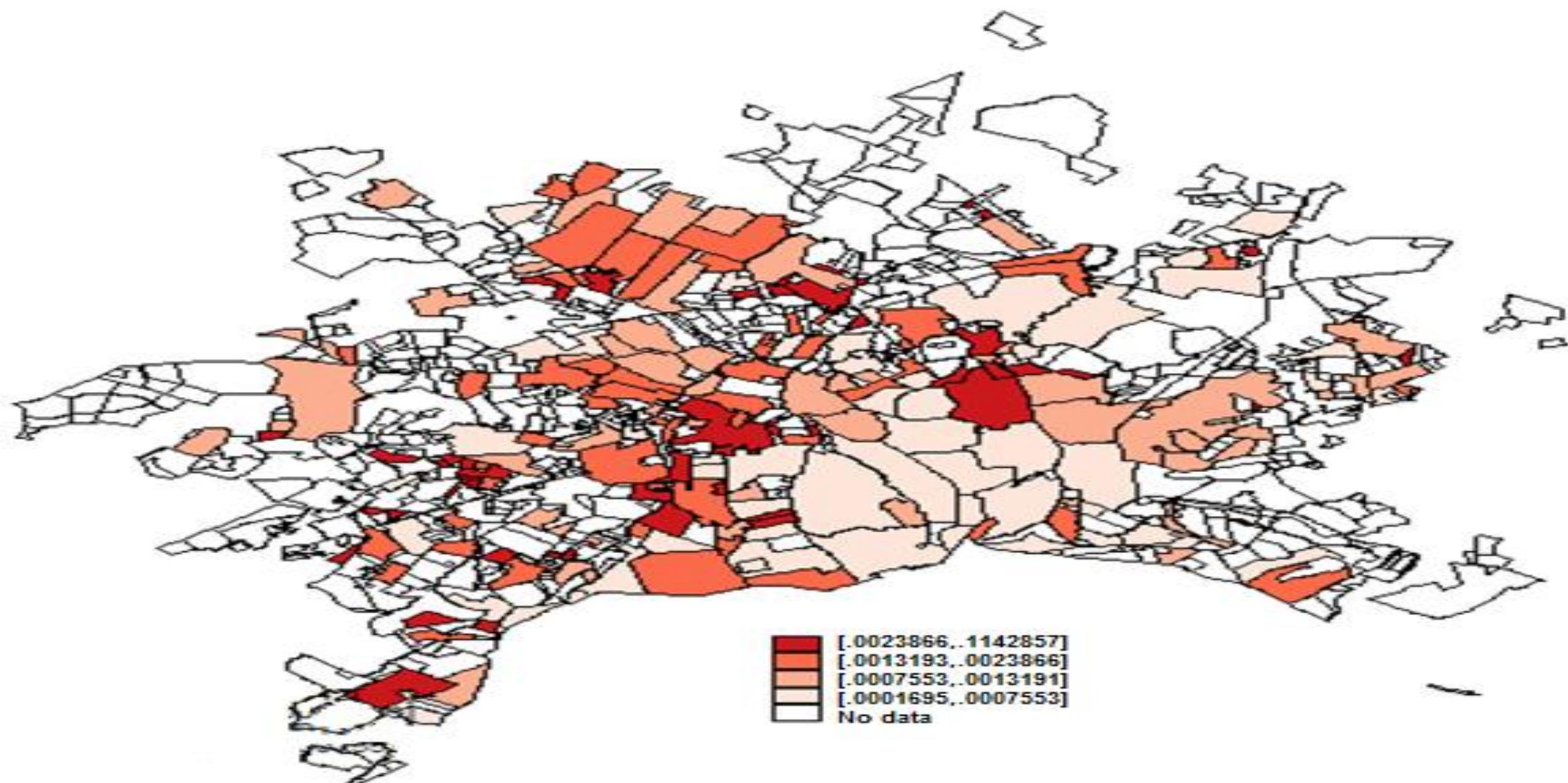
Table 1: Honoring Debt and delinquency loans for more than 1 day and 90 days or more

Classificação	More then 1 day	90 days or more
Honoring Debt	87,26%	92,36%
Default	12,74%	7,64%
Total	100%	100%

- The amount is almost double compared to the entrepreneurs that are in debt for a period of 90 days or more.
- When people with low incomes have a financial unforeseen, usually postpone the debts they consider less important, since their resources are very limited. And after the fact, with a more stable situation, they pay their arears.



Distribution of Loans in Goiania.



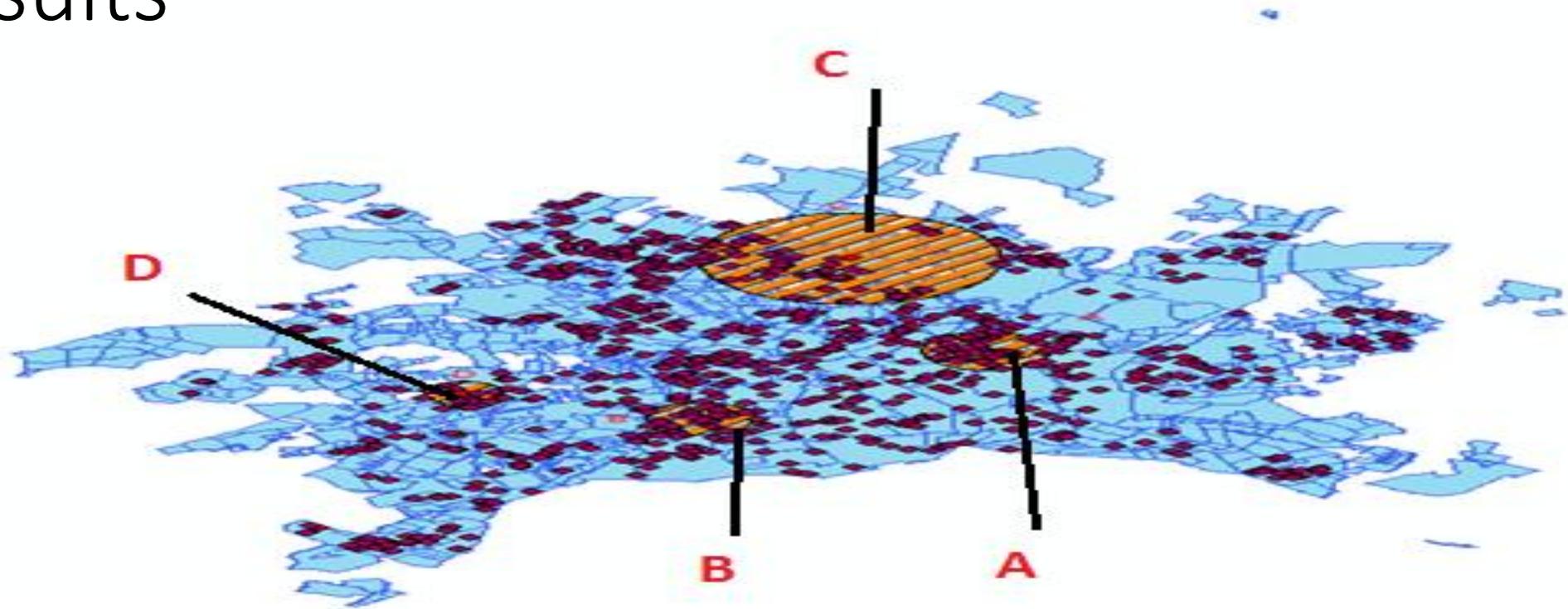
Methodology

- Scan statistics developed by Kulldorff and Nagarwalla (1995). It is used to detect and evaluate groups of spatial spatial-temporal cases, and temporal. The spatial case, seeks to identify regions with higher prevalence than others.
- The method is defined by a cylindrical geographic window, located in different coordinate whose radius can vary in size from zero and limit being specified by the investigator, that is, the window is flexible in both size and location.
- The method creates an infinite number of distinct geographical circles with different sets of neighboring data locations within them. This process is based on the maximum likelihood method, so for each region analyzed, assigned a probability taking into account the actual data and the expected number of inside and outside the window cases. Each circle is a possible candidate cluster. The SaTScan detects these cluster through the maximized likelihood function over all window locations and sizes and the one with the maximum likelihood constitutes the most likely cluster. This is the cluster that is least likely to have occurred by chance.

Methodology

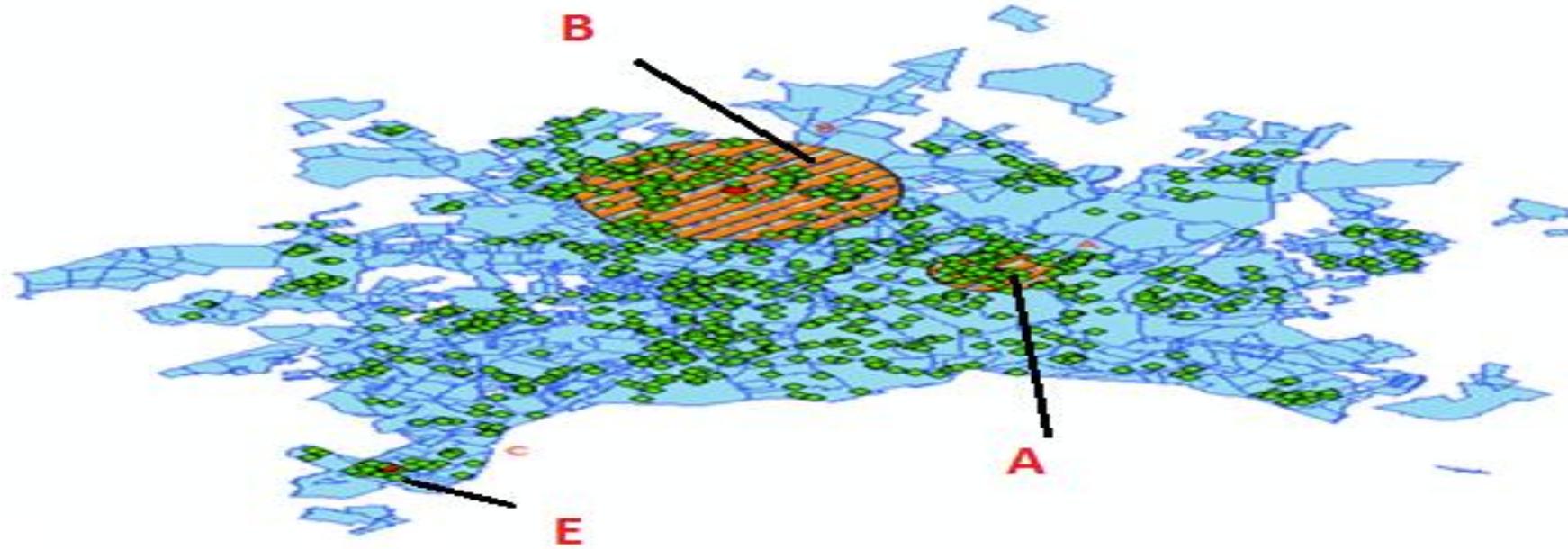
- **The p-value is obtained through Monte Carlo.** The method of Monte Carlo simulation is used to evaluate the statistical significance of the cluster, where the null hypothesis of no clustering is rejected at a 5% level of significance, ie, one can reject the null hypothesis at 5% if the p-value is less than 5%.
- We assume a Poisson distribution for detecting the cluster of access to credit and the Bernoulli distribution, to test whether spatial differences exist with regard to performing and nonperforming and gender.
- Elliot et al. (2000) and Elliott and Wakefield (2001) can not induce causal relations through cluster. For such an interpretation must take into account other methods. The results from the scan statistics are made through the SaTScan software, are analyzed by ArcGIS.

Results



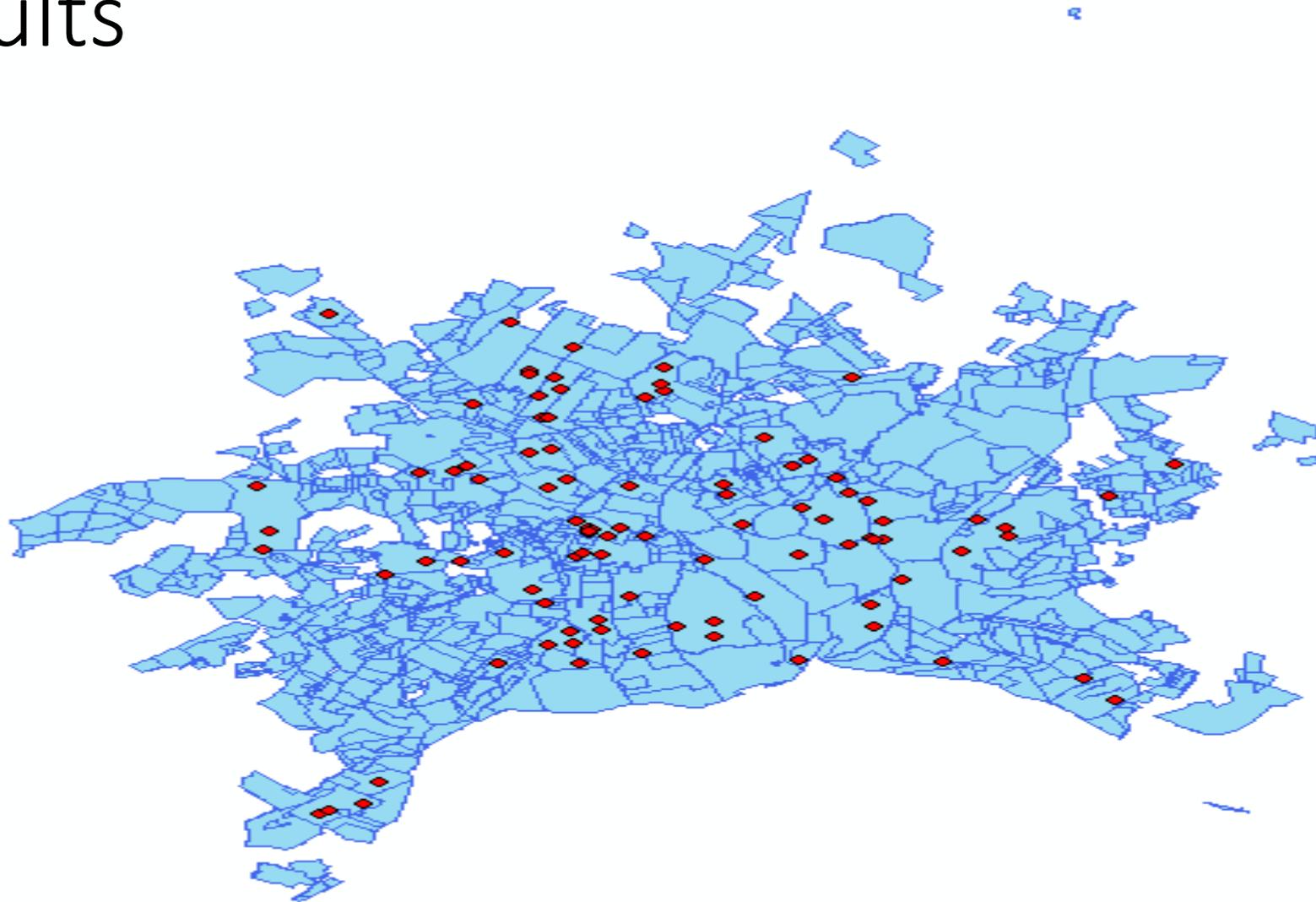
Zone	Rank	Radio Km	LLR	Obs	Esp	RR	p-value	Centroid
A	1	1.3	46.2	81	22.73	3.75	0.00	Centro
B	3	1.1	23.79	64	23.82	2.79	0.00	Jd. Europa
C	6	3.1	20.35	96	47.3	2.12	0.00	Prq. Balne.
D	9	0.8	11.58	19	4.95	3.88	0.01	Lore. Parq.

Results



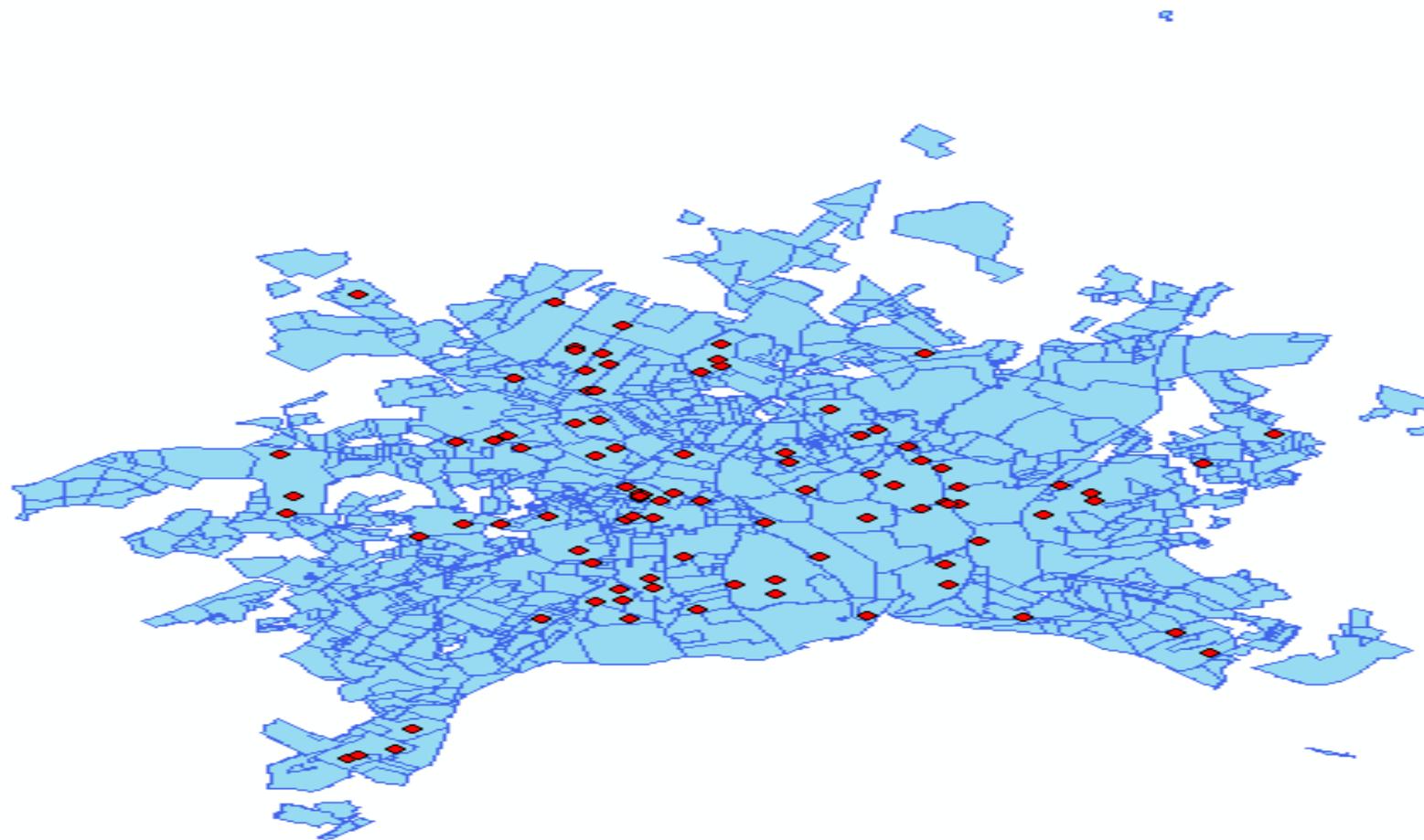
Zone	Rank	Radio Km	LLR	Obs	Esp	RR	p-value	Centroid
A	2	1.3	25.24	54	17.45	3.23	0	Centro
B	3	3.3	20.44	144	83.38	1.87	0	Re. Barrav.
E	6	0	13.71	16	3.03	5.34	0	Jd. Itaipu

Results



Armendáriz e Murdoch (2007), poor are good payers.

Results



No difference between men and women.

Conclusions

- The paper verifies the influence of environment on loans made by the People's Bank of Goiania. Using the methodology Scan Statistics, the results show clusters for loans and for customers (corroborate with models of information dissemination, Duflo et al. (2012)).
- Delinquent customers with 90 days or more, did not show any significant cluster, ie, loans are distributed randomly in Goiânia. The same result was found when we consider loans with 30 days and 60 days or more late.
- No significant difference between genders.