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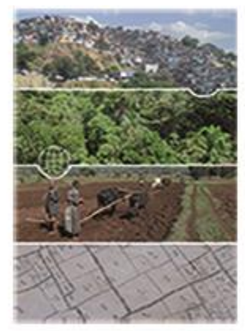

A Pessimist is an Optimist that Knows Geography

Farid Matuk, Luis Triveño
29x55, World Bank
matuk@29x55.com

INTRODUCTION

The novelty is to introduce the distance between cells as explanatory variable by itself, as well as frame for statistical noise in disturbance term in a 8 million people city.

MATERIALS

The city of Lima is made of 69,409 dwelling blocks (with a minimum size of 100 square meters and with more of 15 inhabitants in each) according 2007 Population Census in Peru.

METHODS

$$Y = X\,\boldsymbol{\beta} + \boldsymbol{\lambda}\,W\,y + u$$
$$u = \boldsymbol{\rho}\,M\,u + \varepsilon$$
$$E(X'u) = 0$$
$$\varepsilon \text{ i.i.d. } N(0, \sigma)$$

Where Y is the logarithm of income, X is the demographic, social and economic characteristics of households in each block, W is the spatial contiguity matrix, and M is the spatial auto-correlation matrix. Elements of matrices W and M are made with the distance in meters between observations. Greek letters are parameters to be estimated.
Household characteristics are: dwelling size, tenure and materials; public services; birth rate; age pyramid; education attained; employment insertion; self identified ethnicity; government issued ID.

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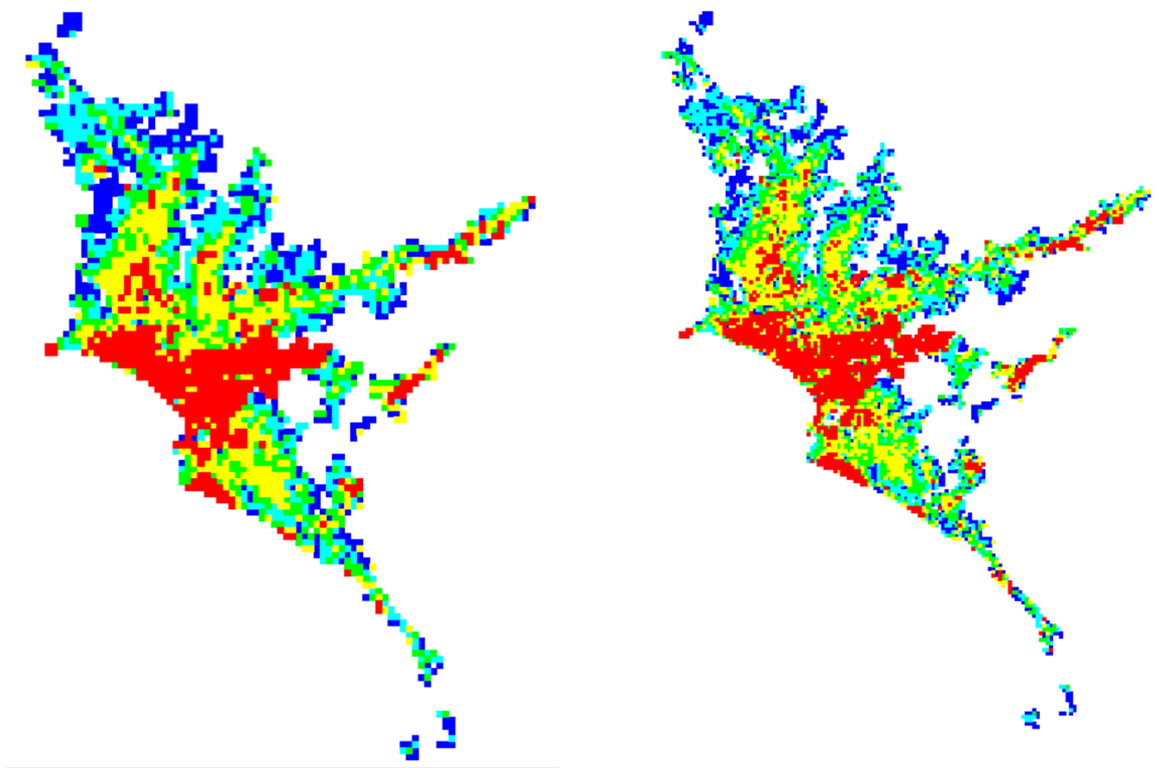
Especial thanks to Natalia González.

RESULTS

Income by Quintile

Red = High / Yellow=High-Medium / Green=Medium / Turquoise=Medium-Low / Blue=Low



700 meters x 700 meters cells 400 meters x 400 meters cells

Household Income (estimated parameters)	OLS		Spatial ML	
	700x700 cells	400x400 cells	700x700 cells	400x400 cells
Household overcrowding	-2.10	-2.55	-1.03	-1.04
Lack of schooling	-2.83	-2.24	-1.24	-0.57
Household size	12.14	11.19	10.38	8.93
Intercept	5.93	6.01	5.37	5.35
Likelihood logarithm	-1260.98	-3618.38	-253.40	-685.03

CONCLUSIONS

- The effectiveness of a policy to provide better income to households through housing plans to reduce overcrowding and with better primary education programs will have less impact when taking account on the spatial location of households.
- Housing impact is reduced approximately by half, without major difference due to grid size (700 mts versus 400 mts).
- Education impact is sensible to grid size: reduction is one half with 700 mts grid and one fourth with 400 mts grid
- **Larger spatial granurality will provide less bias in estimated parameters**

LITERATURE CITED

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