

Valuing environmental characteristics in urban slums. A spatial hedonic approach for Chilean cities.

E. Espinoza, J. Balaguer

Session: Economics of Climate Change: Finding a Fit with
Existing Analytical Frameworks

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Outline

- **Introduction**
- **Questions**
- **Methodology**
- **Results**
- **Conclusions**



Introduction

- Chile is a social country, economic and environmentally vulnerable to the climate change.
- Chilean Government doesn't know to certain science the economic cost of the prospective impacts of the climate change
- Environment and basic services are essential on the economic system.



Introduction

- Amenities related with the climate change should be considered as economic goods and they have economic value.
- This good not have substitutes.
- The absence of price signalling has caused a distortion in the perception of the economic agents.



Questions

- How the climate change impacts to social housing in Chile.
- How to provide a method for assessing the effects of climate change over the price of this dwelling.
- How to measure the significance of different attributes expressed on implicit prices.



Methodology

- The lack of theoretical foundations in hedonic price theory was overcome by Lancaster (1966)
- Rosen's seminar paper (1974) imputes prices of attributes based on the relationship between the observed prices and the attributes associated with these products.
- The hedonic hypothesis is that each good is characterized by the set of all its characteristics z_i ($i=1, \dots, k$)



Methodology

- The functional form are represented as:

$$\ln P(Z_i) = \beta_0 \sum_{i=1}^k \beta_i zst + \sum_{i=1}^k \delta_i zen + \mu$$

The resulting function measures the portion of the price that is attributable to each characteristic.

- The marginal price paid is equal to the hedonic marginal price.

$$\beta_i = \frac{\partial P(z)}{\partial z_i}$$



Results

- Data for this analysis came from data for transacted of Housing Solidarity Found Program with 12,769 sales during 2007 – 2008.



- **Valparaiso** contain 424 observations with 30 precarious housing and mean price of USD 12,152
- **Santiago** show 11,844 observations with 1,692 precarious housing and mean price of USD 12,182
- **Concepcion** represented by 496 observations with 85 precarious housing and mean price of USD 12,109



Results

Variable	Total Social Housing		Precarious Social Housing		Others Social Housing	
AREAPEOP	0	-0.04 *	-0.00001	(-0.40) *	-0.00001	(-0.28) *
D_HOUSTYPE	0.00572	-15.21	0.00263	-9.07	0.00583	-14.67
D_HOUSCON	-0.00305	(-5.45)	0.00041	-2.59 ***	-0.00273	(-4.23)
D_SLUMS	-0.02006	(-19.05)	-	-	-	-
WALLCON	5.99714	-15.36	-0.81723	(-9.44)	12.919	-17.38
POVPCON	2.24088	(-8.40)	2.51187	(-11.82)	6.07485	(-12.57)
GREENAR	-0.00052	(-3.91)	0.0003	-5.16	-0.00055	(-3.78)
D_SEAPROX	-0.00063	(-0.57) *	0.00101	-1.64 *	-0.0022	(-1.80) *
JANTEMP	0.00454	-2.41 *	0.00078	-1.38 *	0.00303	-1.58 *
JULTEMP	-0.00533	(-1.64) *	0.00097	-1.49 *	-0.0037	(-1.14) *
JANPREC	0.00257	-1.31 *	0.00129	-1.94 *	0.0015	-0.72 *
JULPREC	-0.00054	(-1.58) *	-0.00026	(-2.11) *	-0.00034	(-0.93) *
JULPREC	-0.00054	(-1.58) *	-0.00026	(-2.11) *	-0.00034	(-0.93) *
D_VARGEN	0.00049	-1.05 *	0.00045	-2.28 *	0.00043	-0.81 *
AGEOWNER	-0.00005	(-4.06)	0	-0.04 *	-0.00005	(-3.96)
HOUSRESID	0.00032	-2.17 **	0.00009	-0.9 *	0.00027	-1.75 *
POVSCORE	0	-11.29	0	(-2.50) **	0	-10.91
LOCASUBS	-0.00037	(-11.78)	-	-	-0.00034	(-10.28)
D_CITYCOA	0.08436	-4.58	0.12338	-23.55	0.09836	-5.28
INTERCEPT	8.52723	-403.01	8.31503	-860.21	8.52544	-398.18
R2	0.9955		0.995		0.995	
Sample	12,769		1,807		10,962	



Conclusions

- Models should be specified so that they correspond to the restrictions implicit in the theory of housing markets.
- The main advantage of the hedonic model, only needs to have certain information.
- This models can be an important baseline information for policies intended to preserve environmental amenities, improve valuation of social housing and reduce negative externalities than affects housing markets.



Conclusions

- Compared to other methodologies the strength of the hedonic approach is that it compares areas in which it is assumed that all cost minimizing adaptations to the climate change have already occurred.
- Estimation of hedonic models using GIS information provide better estimation of environmental amenities value.
- Is essential the implementation of neighbourhood stabilization programs for poor sector, in which effective social housing demand will be shored up.



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