

Land use regulation and housing prices: an investigation for the Spanish case

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- Scarcity of land is the usual suspect when housing prices climb fast during expansions... despite the well-known experience of Japan or Nevada
- In the Spanish case the approval of a Land Law that pronounced developable land most of the territory (Ley del Suelo de 1998) coincide with the beginning of the fast increase of housing prices. Some people still argue that the Spanish Land Law of 1998 was responsible for the increase in housing prices in Spain.
- Quigley and Rosenthal: The net effect of adopting development restrictions may ultimately be symbolic only, meant to appease "not-in-my-backyard"

Long-run horizontal supply curve



- Land accused despite clear signs of explosive demand due to a bubble

City	United States (2003)		Spain (2005)	
	San Francisco	Boston	Barcelona	Madrid
Main Residence	93.3%	97.1%	85.7%	83.6%
Investment comp.	52%	48%	48%	50%
	Expected increases in housing prices			
Over the next year	5.8%	7.2%	16.6%	15.1%
Average in 10 years	15.7%	14.6%	26.5%	25.6%

- Spain: 94.5% of buyers consider that the price of housing is overvalued (a little more than 50% consider that the overvaluation is 30% or more)

- Del Negro and Otrok (2007) show that, while historically most of the variation in house prices in the US was driven mainly by local (for instance state-specific) components, a large proportion of the movement in prices in the period 2001-2005 was common to all the states and not idiosyncratic.

Housing prices and land prices in Spain

- Since 1995 until 2004 the cost of construction (materials and wages) are going down in real terms
- The fact that land prices are going up does not mean that housing prices are pushed up by the price of land
- Price setting very different during stable periods and expansions of the housing market. In stable periods housing prices are set as the sum of costs plus "industrial profits". In expansion demand (interest rate and maturity of mortgages, disposable income, etc.) sets prices. Land prices are derived from housing prices -> increase in the negotiating power of land owners. The impact of land cost on the price of houses is very procyclical.

- There are many different types of land regulations. Quigley and Rosenthal (2005) distinguish six groups
 - 1 Population controls (caps on growth or permits)
 - 2 Floor space controls (not-for-use land, different uses, etc.)
 - 3 Infrastructure controls (water supply, treatment quality, etc.)
 - 4 Zoning controls (rezoning, downzoning)
 - 5 Political controls (voters approval, supermajority requirements, etc)
 - 6 General controls (growth elements and others)

How do people measure land use restrictiveness?

- It is quite popular in the literature to use an index for land use restrictions. This indicator is calculated just summing up the number of individual restrictiveness measures used in a jurisdiction. Jurisdictions with higher index value are assumed to have more stringent regulatory environments.
- Individual techniques include: farm preservation policies, development impact fees, large lot zoning, building caps, environmental preservation zoning, moratorium on growth, zero lot line housing prohibition, etc.
- This index is incredibly imprecise. What do we mean by moving from one to two techniques? Is it the same what specific land use management technique is in place?

Other measures of land use restrictiveness

- Surveys of local planning officials identifying the presence, absence or relative importance of land restrictions (Linneman et al 1990; Levine 1999). The most famous is the Wharton study
- Malpezzi (1996): presence of water
- Pollakowski and Wachter (1990): ratio of vacant and buildable land by planning area

Incredibly brief summary of the literature

- Pollakowski and Wachter (1990): find that the percent of land vacant and development ceilings do not have any explanatory power on housing prices
- Ihlanfeldt (2007) finds that the number of land restrictions have a statistically significant effect on housing prices: a unit increase in the index of restrictiveness in a county with the average number of cities increases the price of housing 7.7%
- Quigley and Rosenthal (2005): the claim that zoning and rent control raises housing prices is far from conclusively established in empirical research

- Montalvo (2000) finds no correlation between the price of residential land and the number of years needed to exhaust the urban vacant land given the growth rate of population in municipalities of more than 20.000 inhabitants.
- Land laws: basis and coincidence with changes in the housing cycle
- Type of different land is a sufficient statistic
- Change in the law. Use only data before 2006 (discussion of the new law)

- Need data on municipalities for this type of exercise on the effect of land regulation
- Data from the Atlas de la Vivienda: information on 8,101 municipalities of Spain. Separates urban land and urban vacant land by municipality.
- Information on prices: only for 357 municipalities (data from the Sociedad de Tasación).
- Measure of restrictiveness: urban vacant land over urban land.

- Detailed information on the type and uses of land by municipalities
- Municipalities of Barcelona (311) and Madrid (179).
- Number of municipalities: 490. With information on land availability by categories: 337. With information on housing prices (Sociedad de Tasacion): 82
- The most restrictive criterion is the availability of prices. The ST has the largest sample (many more than the Ministerio de Vivienda and similar to TINSA)

Measure of restrictiveness II

- Types of land by degree of development (urban, developable and especially protected) and use (residential, commercial, industrial, etc.)
- We are going to use as measure of land restrictiveness two alternative concepts:
 - ① Ratio of programmed buildable land over total land minus especially protected land (*REG*)
 - ② Ratio of buildable land over total land minus especially protected land (*REG1*)

The econometric specification

$$\begin{aligned}\ln P_{i,05} - \ln P_{i,01} = & \beta_0 + \beta_1 (\ln IMM_{i,05} - \ln IMM_{i,01}) \\ & + \beta_2 (\ln POP_{i,05} - \ln POP_{i,01}) \\ & + \beta_3 (\ln EMP_{i,01} - \ln EMP_{i,91}) + \beta_4 REG_{i,00} \\ & + \beta_5 RENTAL_{it} + \beta_6 P_{i,01} + \epsilon_i\end{aligned}$$

- where *IMM* are number of immigrants, *POP* is population, *EMP* is employment, *RENTAL* is the proportion of rental housing and *REG* is the index of land restrictiveness.
- Population and immigrants are demand proxies. The trend in employment proxies for local macroeconomic conditions.

- Immigrants may look for locations where housing prices grow slowly (see Saiz 2007 or Gonzalez and Ortega 2009) although I would have thought that immigrants look for places with a low level of house prices. Need to find instrumental variables:
- Two alternative instruments:
 - 1 Proportion of immigrants in the initial year. Identification assumption: Immigrants inflows before the beginning of the sample are not driven by omitted variables that will affect prices in the future.
 - 2 Participation rate of female immigrants (proxy for availability of jobs for immigrants in a particular location). Cautionary comments

Correlations data I

	$\Delta \ln IMM_{05-01}$	$VACANT_{00}$	$\ln P_{01}$
$\Delta \ln IMM_{05-01}$	1 5650		
$VACANT_{00}$	0.097* 5225	1 7580	
$\ln P_{01}$	-0.28* 357	-0.042* 342	1 357

Correlations data II

	$\Delta \ln IMM_{05-01}$	REG_{00}	$\ln P_{01}$
$\Delta \ln IMM_{05-01}$	1 479		
REG_{00}	-0.022 355	1 337	
$\ln P_{01}$	-0.179 82	-0.253* 77	1 82

Results I

	(1)	(2)	(3)
$\Delta \ln IMM_{01-05}$	0.006 (0.36)		-0.00 (0.26)
$\Delta \ln POP_{01-05}$	0.49* (5.73)	0.57* (4.83)	0.57* (4.64)
$\Delta \ln EMP_{91-01}$		-0.04 (0.94)	-0.03 (0.64)
$VACANT_{01}$	0.10 (1.90)	0.10 (1.80)	0.10 (1.70)
$RENTAL$	-0.45* (3.56)	-0.48* (3.96)	-0.41* (2.92)
$\ln PH_{01}$			-0.05* (2.02)
R^2	0.16	0.16	0.17

Results II

	<i>OLS</i>	<i>IV1</i>	<i>IV2</i>
$\Delta \ln IMM_{05-01}$	0.03 (0.64)	0.05 (0.48)	0.00 (0.01)
$\Delta \ln EMP_{01-91}$	0.03 (1.06)	0.02 (0.59)	0.01 (0.29)
<i>REG</i> ₀₀	-0.06 (1.27)	-0.06 (1.25)	-0.07 (1.44)
<i>RENTAL</i>	-0.57* (2.11)	-0.57* (2.12)	-0.63* (2.35)
R ²	0.10		

- We cannot find any effect of the increase in immigrants, population or employment
- Availability of buildable land doesn't have any effect on price increases
- The higher the proportion of renting the slower the growth rate (but if we include the price in the initial period then this effect is not statistically significant). Inlanfeldt (2007): "the only control variable that appear perplexing is that housing prices are higher in neighborhoods containing more renters". In our estimation there is not such a perplexity.

Other explanatory variables

- Results are unaffected if we include initial attributes of the cities like the proportion of workers with a college degree (predictor of future growth of population)
- However, if we include the initial level of prices then the only significant variable is this one (which is carefully avoided in all the other studies on the determinants of the growth of housing prices)

- The availability of buildable land, measured as vacant land over non-especially protected land, doesn't seem to have any effect on the growth rate of housing prices
- The proportion of renters seems to have a negative impact on the growth rate of prices
- Once the initial level of prices is control for, this variable is the only relevant one

- The influence of the proximity to other cities (interaction of index of number of cities by distance by vacant land)
- Obtain data on zoning (industrial, commercial and residential) in the initial year. Unlikely
- Increase the sample to municipalities of other provinces

- Try other instrumental variables. Saiz (2007) uses two IV: prediction of immigrants using proportions in the base year

$\widehat{INM}_{kt} = \phi_{k,1983} INM_{ES,t}$ is similar to our approach. He also uses the share of immigrants by country into each MSA in 1983

$\widehat{\Delta INM}_{kt} = \sum_j \phi_{j,k,1983} \widehat{\Delta INM}_{j,ES,t}$ where j is the country of origin (need a prediction of number of immigrants by country). This second instrument is also used in Gonzalez and Ortega (2009)

- Use panel dimension
- Try other explanatory variables (if they are available at the municipal level)

- Gleaser, Gyourko and Saiz (2008): place with more elastic housing supply have fewer and shorter bubbles, with smaller price increases. However, the welfare consequences of bubbles may actually be higher in more elastic places because those places will overbuild more in response to a bubble. Include new building construction as object of analysis.