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Forms and Norms: how planning affected housing prices variation in Italy during the crisis

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Abstract

According to numerous studies in the literature, urban planning norms have an important effect on housing prices. A large quantity of data and empirical studies focusing on building restrictions and housing prices refer to the American real estate market. The current study, instead, set out to examine the relationship between city-planning and the cost of housing in the Italian real estate market. While, however, recent studies carried out here have prevalently focused on the boom phase of the real estate cycle, the present study primarily probes the bust period. We used a multivariate regression model to analyze the effect of urban planning norms on housing (new and existing units) price variation. The model shows that in those localities where building regulations had permitted more buildings to be constructed during the boom phase, prices fell to deeper level during the bust one. These findings have implications with regard to the real estate crisis as well as to housing affordability policies here in Italy and elsewhere.

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Keywords: Urban planning; housing bubble; boom and bust cycle; regression analysis; housing.

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1. Introduction

Some empirical evidence demonstrates that land-use planning restrictions and regulations impact housing prices (Katz and Rosen, 1987; Pollakowski and Watcher, 1990; Malpezzi, 1996; Malpezzi, Chun and Green, 1998; Levine, 1999; Mayer and Somerville, 2000; Glaeser and Gyourko, 2002, 2003 and 2005; Anthony, 2006; Glaeser and Ward, 2006; Ihlanfeldt, 2007; O'Toole, 2007, 2009 and 2012; Cheung, Ihlanfeldt and Mayock, 2009; Quigley et al., 2009; Kok et al., 2014; Bisulli and Micelli, 2015; Calabrò and Dalla Spina, 2014, Micelli, 2014). According to an analysis carried out in the United States, in fact, in 2006 the price of a median home in those states where restrictive growth-management planning had been introduced was 5 times the median family income; conversely, the price of a median home in the states where no restrictive growth-management laws had been passed was 2.7 times the median family income (O'Toole, 2007).

There is even empirical evidence that some restrictive U.S. land-use policies are themselves responsible for high housing costs and were major contributors to the housing bubble (O'Toole, 2009 and 2012; Sowell, 2010; Cox, 2011 and 2012; Hardaway, 2011). O'Toole's (2009) empirical and statistical analysis of the cost of housing in fifty U.S. states (and in each of the 384 U.S. metropolitan areas) highlights a strong correlation between restrictive, complex growth-management policies and housing bubbles. Huang and Tang's (2010) analysis of residential land use regulation and the US housing price cycle between 2000 and 2009, which considered data from 326 U.S. cities, likewise concluded that the cities that introduced more stringent land-use and building regulations experienced stronger price booms and bursts in housing prices. Finally, Ihlanfeldt and Mayock's (2014) recent empirical analysis drew the conclusion that intermarket differences in housing supply elasticity in the United States explain much of the variation in housing prices during the recent boom-bust cycle.

A large quantity of data and empirical studies focusing on regulations and housing prices have been dedicated to the American housing market. The current study, instead, set out to examine the relationship between land-use planning and house prices in the Italian real estate market. While recent studies on this particular market have principally focused on the boom phase of the real estate cycle, the current investigation set out to examine the bust one. The aim of this short paper was then to assess if and how urban planning norms have had any impact on the decline in housing prices during the real estate market crisis here in Italy.

2. The data and the model

A multivariate regression model was used to test our hypothesis that urban planning impacts house prices; our observation sample was based upon 114 major Italian cities. The variation in average residential unit prices, which is related to economic and building stock variables, was based on various official datasets. The period analyzed was 2008 to 2014 during which time the housing market in Italy suffered a severe setback (D'Alpaos and Canesi, 2014).

That particular timeframe was chosen to permit us to examine if urban planning, just as some other well known national economic factors, has a specific, autonomous relevance on housing price variation, in this case mainly during a bust phase in the real estate market.

Prices were collected cross–sectionally thanks to a preliminary research stage. Although cross-sectional data are potentially biased (Beck and Katz, 1995), at this early stage, the study's aim was simply to verify if urban planning regulations actually affect housing prices; further analysis will be able to refine the model and the results.

Cross-sectional data can moreover be helpful in describing the Italian real estate market. It is important to underline that given its structure, the housing market in Italy is not as volatile as that in the UK or USA even during boom phases.

The housing prices were drawn from the *Consulente Immobiliare*, an official Italian real-estate journal which provides official semi-annual estimates of average housing unit prices. The inflation index, provided by the Italian National Statistics Institute (ISTAT), was used to render data comparable over time.

Independent variables were built on both economic and building stock data, as follows:

- Employment rate variation (%);
- Income per capita variation (€);
- City area (Sqkm);

- Housing units built from 2001 to 2011 (number).

All data were collected from ISTAT records. Both the employment rate and per capita income variation refer to the 2008-2014 period.

It is difficult to collect and describe building restrictions as quantitative data in a statistical analysis. According to the literature (Glaeser and Gyourko, 2003; Glaeser and Ward 2009), the index that is usually utilized is the number of building or construction permits that have been granted. Unfortunately those data are no longer available from official Italian sources (since 2008) due to statistical confidentiality. Since another one was needed to represent the city building permits granted, we decided to use the number of housing units built between 2001 and 2011 as a proxy of urban planning-building restrictions. That figure has, of course, an obvious bias: apart from urban planning characteristics, the number of constructions built during a given period also reflect the market demand in a particular area. It is, of course, impossible to distinguish between the two factors. The economic variables included in the model help, nevertheless, to minimize the bias because they reflect the economic condition of families and companies and, primarily, represent their spending power.

The model is also affected by the mismatch between time and other variables, both dependent and independent. ISTAT conducts a population and housing survey every ten years, meaning that its most recent data refer to 2011. To understand the characteristics of building restrictions over time, we need to examine the data collected in 2001.

The Italian construction industry has faced a severe setback since 2008, with approximately a 32 percent decline in investments, meaning a loss of approximately € 62 billion (Ance, 2014). It should also be remembered that the Italian housing market is characterized by long term structural stability and that during the boom years of the real estate cycle, that is from 1998 until 2008, the maximum incidence of units traded was approximately 3% of the entire housing stock (source: "Osservatorio del Mercato Immobiliare dell'Agenzia delle Entrate" – the National Observatory on the Real Estate Market of the Italian Revenue Agency).

The model assumes that the quantity of building stock over the three years for which data are missing was stable.

The model was utilized for both the new and existing unit submarkets; in both cases the results were statistically significant.

Table 1.Estimation of price variations during 2008-14 period in the new housing unit sub-market

Parameter	Coeff.	T - Value	P-value
Constant	-9.2756	-0.1414	0.8878
Employment rate variation	407.702	2.5408	0.0125
Income per Capita variation	0.1581	2.8140	0.0058
City area	0.5021	3.1966	0.0018
Housing units 2001-11	-0.0259	-7.2879	0.0000
Model			0.0000
Observations (number)	114		
R^2	44.9997		
$R^2_{adj.}$	42.9814		

The results were satisfactory: all the variables except for the employment rate were statistically significant at 99%, and the model explains almost 43% of the price variation in the samples observed. This is a relevant result, given the diverse factors affecting real estate market dynamics. The model clearly shows that the more housing units that were built during the boom phase, the more prices declined during the bust one (see Table 1 and Figure 1).

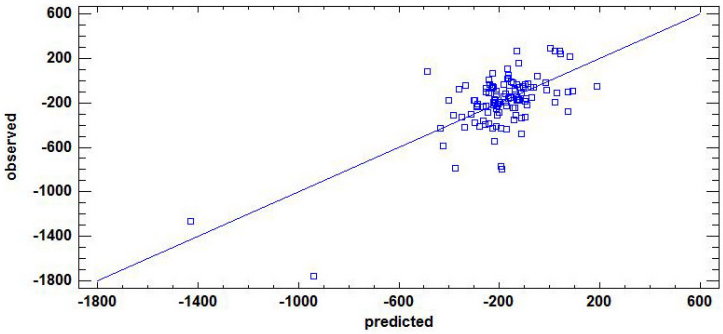

Fig. 1. The regression function of price variation for new housing units.

The price variation shows indeed a negative sign for both new and existing housing submarkets (see Tables 2 and 3). The price decline was slightly worst for the former with respect to the latter, but there was a higher variance of observation for the latter, meaning that this submarket was more affected by local dynamics with respect to new units.

Table 2.Descriptive statistics for prices variation (2008-14) for new housing units

	2014	2008 deflated	Variation 2014-08
Mean	2762.35	2954.28	-0.058669
Standard deviation	1040.45	1211.53	0.070261
Minimum	1233.33	1279.83	-0.286545
Maximum	6800.0	8410.33	0.167564

Table 3.Descriptive statistics for prices variation (2014-08) for existing housing units

	2014	2008 deflated	Variation 2014-08
Mean	2210.01	2350.19	-0.049047
Standard deviation	834.738	951.176	0.078303
Minimum	933.333	1080.55	-0.290316
Maximum	5708.33	6289.47	0.241683

The results were also consistent with regard to price variations in the existing units, although the model explains just 22% of the data variations noted (see Table 4). Moreover, building restrictions were less relevant in the existing unit market with respect to the new housing one, even if the coefficient estimate has the same sign.

Table 4.Estimation of price variations during 2014-08 period in new housing unit sub-market

Parameter	Coeff.	T - Value	P-value
Constant	-55.9834	-0.973859	0.3323
Employment rate variation	453.181	3.22232	0.0017
Income per Capita variation	0.0867979	1.76207	0.0809
City area	0.350651	2.54719	0.0123
Housing units 2001-11	-0.0115999	-3.72558	0.0003
Model			0.0000
Observations (number)	114		
R^2	24.38		
$R^2_{adj.}$	21.60		

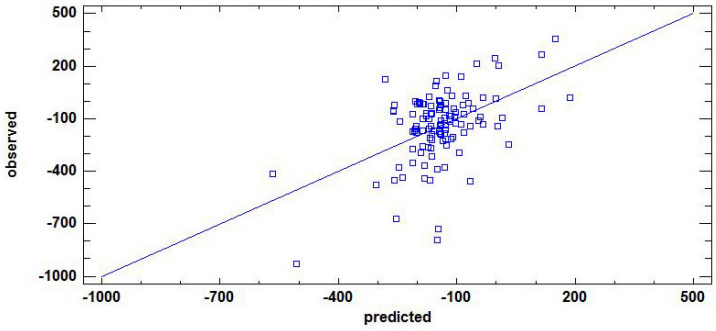

Fig. 2. The regression function of price variation for existing housing units.

As far as cities' relevance is concerned, we can say that price trends during the period considered tended to be better in larger cities. Most major Italian cities, even those with wide administrative boundaries, are for the most part inhabited by fewer than 100,000 persons. Given Italy's specific urban structure (Della Spina, Scrivo, Ventura and Viglianisi, 2015), these results indicate that the housing market has declined to a lesser degree in less dense cities, although, given the variables involved, this cannot be considered a definitive conclusion.

The other two economic variables are consistent with urban economic literature: income per capita and employment rate represent the wealth of families and companies, in other words, market demand. Consequently, solid fundamentals of market demand positively affect housing price variation.

This attempt to examine the impact of building restrictions on housing prices in Italy has a twofold interpretation: on the one hand the more units that were built during the period between 2001 and 2011 the more prices fell during the crisis. But it also means that, in accordance with the literature (Glaeser and Gyourko, 2003; 2005), housing affordability *is* positively affected by weak building restrictions.

3. Conclusion

This work, which is the initial part of a research project, represents one of the first attempts to examine the relationship between housing prices, particularly during a bust phase of the real estate market cycle, and zoning regulations in Italy.

Many authors who have examined and compared the bust/boom cycles have reported that the percentage price decline was clearly greater in those places where prices had reached higher levels. But when attention is focused specifically on the bust phase, it is more difficult to interpret the data that has been collected on this phenomenon.

Our preliminary statistical analysis uncovered that variations in housing prices between 2008 and 2014 were negatively correlated with building restrictions.

The simple model proposed here deserves in-depth analysis and further elaboration. A more precise indicator of zoning rules needs to be found to confirm these preliminary results and to overcome the bias inherent in our proxy. Future studies could, moreover, concentrate on a few metropolitan areas, given the high variability of building restrictions from city to city.

Given the need for more extensive empirical analyses, a greater effort must be made to interpret the data concerning housing prices variation. The timeframe of the current study is, in fact, too short and too close to the present to permit us to draw definitive, solid conclusions about causal relationships between prices variation, supply and urban planning norms.

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