

Green Energy and Technology

Salvatore Giuffrida ·  
Maria Rosa Trovato · Paolo Rosato ·  
Enrico Fattinnanzi · Alessandra Oppio ·  
Simona Chiodo *Editors*

# Science of Valuations

Natural Structures, Technological  
Infrastructures, Cultural Superstructures

 Springer

# **Green Energy and Technology**

Climate change, environmental impact and the limited natural resources urge scientific research and novel technical solutions. The monograph series Green Energy and Technology serves as a publishing platform for scientific and technological approaches to “green”—i.e. environmentally friendly and sustainable—technologies. While a focus lies on energy and power supply, it also covers “green” solutions in industrial engineering and engineering design. Green Energy and Technology addresses researchers, advanced students, technical consultants as well as decision makers in industries and politics. Hence, the level of presentation spans from instructional to highly technical.

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# Oligopsony Hypothesis in the Real Estate Market. Supply Fragmentation and Demand Reduction in the Economic Crisis



Pierluigi Morano, Francesca Salvo, Manuela De Ruggiero, Francesco Tajani, and Daniela Tavano

**Abstract** This paper intends to examine the property market structure, taking into account the effects determined by the 2007 financial crisis, that has hit the real estate sector producing both the multiplication and fragmentation of the supply and a progressive reduction in the demand. Starting from an examination of the market structures that typically describe the behaviors of the real estate market operators, the research prefigures the hypothesis of oligopsony, normally referable to movable asset classes. As evidence of the hypothesis, a case study referring to the city of Cosenza (Southern Italy) has been analyzed. The study carried out highlights market anomalies that can occur in specific conditions, by determining the difficulty to identify reliable comparables for the assessment of property market values.

**Keywords** Market structure · Oligopsony · Appraisal · Asking prices · Market value

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# 1 Introduction

Appraisal is a relatively recent scientific discipline. In a rather short period of time, it has been able to equip itself with a very solid but at the same time flexible epistemological *proprium*, capable of adapting and responding to the requests of a constantly changing society, showing its complex and interdisciplinary nature. The empirical phenomena and the widespread reference literature have pointed out that appraisal is able to respond both to practical questions and to emergencies more closely linked to the environmental and historical issues [5, 15, 17].

This has been possible thanks to the liveliness of research and academic debate which, starting from solid and indisputable appraisal prodromes, has led to the definition of several assessment procedures that have become increasingly complex and sophisticated, in a perspective such as that of standardization aimed at conferring objectivity to the evaluations [7, 20].

In compliance with the uniqueness of the underlying methodology, which is based on the comparison between the subject and other properties (precisely “comparables”), the numerous procedures that logically derive from it base their validity on postulates and hypotheses referring to the price formation mechanisms of the real estate sector and, more generally, to macro and micro-economic market theories [24].

It is known that, with reference to the second-hand market, the monopolistic competition is usually considered the most suitable market form, taking into account the conditions of pulverization of the supply and the demand, the strict substitutability of the properties, the high elasticity and the cross-elasticity of the demand [13]. These assumptions are reflected in the price formation mechanism, whereby the degree of discretion in supply remains contained within certain limits, producing a sort of leveling of the selling prices. This circumstance is evident from the fact that, by examining the different market segments, it is possible to trace market trends evidenced by the level of substantially homogeneous average prices for similar goods located in the same area.

Under these conditions, the formation mechanism of sold property prices can be interpreted, so that, in compliance with the appraisal principles, it is also possible to predict the most likely market values.

However, it should be noted that, in recent years, and especially in *static* real estate markets, these assumptions are not satisfied by the empirical evidence, by revealing the need of use of rationality measures and weight coefficients to bridge the gap between hypothesis and reality [23].

Based on these considerations, this contribution intends to examine the conditions that characterize the real estate markets that have particularly suffered the effects of the financial crisis, verifying the impossibility of applying the conditions of the usual market structures, and prefiguring the existence of alternative ones. Starting from the analysis of the market structures typically used in the real estate sector (Sect. 2), the contribution assumes the possibility of referring to oligopsonic markets (Sect. 3), verifying in a real case study (Sect. 4), the goodness of the hypothesis assumed. The results suggest the opportunity to adjust the appraisal procedures in the light of the

specific conditions of interaction between supply and demand, as discussed in the conclusions (Sect. 5).

## 2 Market Structure in Real Estate Sector

Operating in the real estate market means acknowledging the multiplicity, diversity and complexity presented by the demand and the supply of properties. The real estate market cannot be simplified as a unitary one, but it is divided into sub-markets according to the price level, the location models, the type of real estate, and much more [19].

The analysis of market structure in the real estate sector is aimed at defining the local, technical, economic and social context of the real estate data, and the behavior of the supply and the demand, for the purpose of forecasting the market value.

The framework provided by the economic theory regarding market structure, however, mainly refers, if not exclusively, to independent and mono-functional (usually movable) goods; on the other hand, the real estate market is made up of multifunctional assets that can have multiple intended uses.

Even in the simplification owing to the passage from hypothetical markets to the real ones, it is clear that in the short term and in conditions of partial equilibrium, for the real estate sector none of the market structure can be excluded “a priori” in concrete situations, with the exception of the competitive perfect market, for which the homogeneity of the real estate product cannot be assumed [10].

The structure of real estate market can be classified by the type of property, according to: the demand and the supply (applicants and bidders—one, few, many; companies, consumers, investors); the product (single, differentiated with or without substitutes, homogeneous); the price elasticity (zero, high, medium, low); the market entry conditions (blocked, semi-free and free); the price formation mechanism (single, limited and unlimited discretionary, discriminated and indeterminate) [12].

Sometimes, there are specific conditions that foreshadow the market form of monopoly. It may happen that a company builds on an area of the city center with high building density, in the absence of competitors: in this case, the monopolist can come to bargain with any single buyer making him pay the maximum price that he is willing to shell out. In summary, there is only one seller and numerous buyers, the product is without substitutes, the market entry conditions are blocked, and price formation is discriminated [18].

In the market segment of new properties, bidders can divide the market by areas or territorial areas with overt or tacit agreements; in areas of expansion for the urban cities, several companies can accommodate the price of larger companies with a higher number of construction sites or for a longer time. In these contingences, conditions of oligopoly are created, with few sellers and numerous buyers, the nature of the product is homogeneously differentiated, the market entry conditions are blocked, and the price formation is discriminated [8].

In the real estate sector, there are also examples of bilateral monopoly between two parties (buyer and seller) in particular situations related to the position and the configuration of the properties, such as the so-called urban wrecks on public spaces, which can only be purchased by owners of neighboring properties, or the synergistic value associated with the annexation of rooms of neighboring apartments. In summary, the bilateral monopoly is constituted by one buyer and one seller, the nature of the product is unique, the market entry conditions are blocked, and the price formation is indeterminate [2].

In the real estate market of second-use properties, the monopolistic competition is the most frequent form, which can occur where the bidder can exercise discretionary power on the price, linked to the spontaneous differentiation of the apartments of the buildings of one neighborhood, but he faces competition from other owners that supply their properties. In short, there are numerous buyers and numerous sellers, the nature of the product is differentiated (in the used apartment market, the differentiation is at least for location and condition of maintenance and conservation), the market entry condition is free, and the formation of the price is discretionary [4].

### 3 Oligopsony Hypothesis?

It is evident that the first decade of the second millennium completely revolutionized the financial markets and the related logics. This contingency has generated markets dominated by uncertainty, a very high volatility of values and a worrying aversion to the investment risk [21, 22]. This was a crisis that transversally affected many asset classes, including the real estate sector. In fact, the fixed milestones of the real estate market—the principles and rules, and the behavior of the operators—could seem to be structurally changed.

It is a shared experience by those who have consulted real estate agents for the sale of their properties that they are sometimes reluctant to formulate value judgments, especially in the current situation of uncertainty firstly related to the 2007 economic crisis and then to the diffusion of the Covid-19 pandemic. They instead tend to invite the property owner to directly indicate the asking price, leaving the task of concluding the transaction either to the market or to the “luck of a meeting”. This contingency has been especially widening in small provincial towns, in which the demand contraction has been causing the difficulty to identify reliable comparables for the assessment of the market values. Therefore, the common opinion is that in many cities a market does not exist anymore, as every transaction is unique because it is strongly linked to the individual characteristics of the buyer and the seller.

In these specific conditions, it is legitimate to ask whether the logic used up to this moment to interpret the price formation mechanisms could be still usable or whether it is possible to integrate it with new paradigms.

Normally, in the real estate market the demand is proportionate to the supply, so that the interactive game means that the discretion of prices is very limited,

and the unit prices are substantially leveled, i.e., unit prices are almost homogeneous. However, in some situations the interrelationships between the supply and the demand are far from this assumption: this is the case of atypical, slow, static markets, where the situation seems to recall the oligopsony market form.

An oligopsony is a market form in which the number of buyers is small, whereas the number of sellers in theory could be large. This typically happens in a market where numerous suppliers are competing to sell their products to a small number of more powerful buyers, that have a major advantage over the sellers: they can play off one supplier against another, thus lowering their costs.

This kind of market form usually occurs in specific economic situations, such as that of labor [1], fir lumber [11], and agricultural products [6, 9, 14].

Therefore, an issue to be dealt by the valuers could be: in specific conditions, could the oligopsony form be suitable for real estate market in a time of economic crisis?

## 4 Case Study

Although at this stage of the research, it is not yet possible to provide a clear and exhaustive answer to the question formulated above, in this work it has been decided at least to confirm the existence of the hypotheses characterizing the oligopsony market. The way is to detect condition of pulverization of the supply in the face of a reduction of the demand, as outlined by the high discretion of the asking prices.

The idea has been to investigate the asking prices of second-use condominium apartments in the Municipality of Cosenza (Southern Italy). In particular, 402 data about properties for sale have been collected from real estate agencies. Furthermore, the detected data have been organized and classified according to homogeneous territorial areas (named “microzones”) as regards to exogenous factors (accessibility, presence of services, building characteristics, green areas, pedestrian zones, etc.), defined by the Observatory of the Real Estate Market (OMI) of the Italian Revenue Agency (Table 1) and with reference to the first semester of 2019.

The data collected have been segmented according to the size factor, by considering a subdivision in “small” apartments (less than 80 m<sup>2</sup>), “medium” apartments (from 80 to 150 m<sup>2</sup>) and “large” apartments (larger than 150 m<sup>2</sup>).

Each property has been considered as “subject” for which the asking price is assessed through a comparative procedure that involves all the other properties, considered as “comparables”. In particular, the single-parameter method has been used to implement a market approach method [3]. First, in each considered market segment, the average unit price  $p_j$  has been calculated as:

$$p_j = \frac{\sum_{i=1}^n P_i}{\sum_{i=1}^n S_i}$$

**Table 1** Detected asking prices classified according to the OMI microzone subdivision

Zone	Description	Data number	Unitary average price (€/m <sup>2</sup> )	OMI quotation min (€/m <sup>2</sup> )	OMI quotation max (€/m <sup>2</sup> )
B1	Central	140	1,106.70	1,300.00	1,450.00
B2	Central	12	1,365.00	1,300.00	1,900.00
C1	Semi-central	151	1,082.75	1,300.00	1,550.00
C2	Semi-central	20	703.45	790.00	1,150.00
D1	Peripheral	66	1,096.14	1,050.00	1,300.00
D2	Peripheral	3	496.85	690.00	990.00
R1	Suburban	–		345.00	495.00
R2	Suburban	10	792.45	Not available	
	Total	402			

where  $P_i$  are the detected asking price of the  $j$  comparables and  $S_i$  their corresponding commercial surfaces. Then, the asking price of the subject has been determined as:

$$V_0 = p_j \cdot S_0$$

where  $S_0$  is the subject's surface. Finally, the percentage divergence between the detected asking price and the assessed asking price has been determined.

Table 2 shows an example of the computational processing carried out for the typology of the small apartments of the C2 microzone. The same implementation has been developed for all the typologies—small, medium, and large—of all the microzones that constitute—from a property market point of view—the city of Cosenza, except for the D2 and R1 microzones, for which the collected data are not significant for the analysis. Table 3 reports the descriptive statistics of the calculated divergences.

The analysis has revealed an important inhomogeneity that goes beyond the tolerability thresholds that could be accepted for the assessments, even using a single comparison parameter. Except for the B2 microzone, in all areas there are percentage divergences that overcome 100% (for a “medium” apartment in the B1 microzone and for a “small” apartment in the C1 microzone the values of the percentage divergence are higher than 300%). Totally, the average value of the percentage divergences for all the microzones is equal to about 32%, with the highest value equal to about 47% in the C2 microzone.

Therefore, this dispersion of the data values constitutes, for the case study analyzed, a detector of a market anomaly, related to an excessive “arbitrariness”—i.e., without an effective linkage with the local market behaviors—in the identification of the asking prices. In fact, even if they are generally leveled at the market values by the ordinary dynamics that characterize the formation mechanism of the selling prices, in specific situations an irrational dispersion of the asking prices can generate a short circuit in the implementation of the appraisal methodology, based on the comparison of the property subject with similar properties for which the selling prices are known.

**Table 2** Divergence between detected asking prices and assessed asking prices for the C2 microzone

Surface (m <sup>2</sup> )	Detected asking price (€)	Unitary detected asking price (€/m <sup>2</sup> )	Assessed asking price (€)	Divergence (%)
<i>Small apartments</i>				
20.00	18,000.00	900.00	13,887.15	29.62
52.00	26,000.00	500.00	36,106.60	38.87
68.00	42,000.00	617.65	47,216.33	12.42
70.00	42,000.00	600.00	48,605.04	15.73
70.00	42,000.00	600.00	48,605.04	15.73
70.00	65,000.00	928.57	48,605.04	33.73
77.00	55,000.00	714.29	53,465.55	2.87
<i>Medium apartments</i>				
88.00	35,000.00	397.73	56,764.57	62.18
100.00	39,000.00	390.00	64,505.19	65.40
103.00	89,000.00	864.08	66,440.35	33.95
105.00	74,000.00	704.76	67,730.45	9.26
106.00	100,000.00	943.40	68,375.51	46.25
107.00	59,000.00	551.40	69,020.56	16.98
107.00	85,000.00	794.39	69,020.56	23.15
120.00	38,000.00	316.67	77,406.23	103.70
140.00	115,000.00	821.43	90,307.27	27.34
147.00	98,000.00	666.67	94,822.63	3.35
<i>Large apartments</i>				
150.00	50,000.00	333.33	137,903.23	175.81
300.00	350,000.00	1,166.67	275,806.45	26.90
310.00	390,000.00	1,258.06	285,000.00	36.84

## 5 Conclusions

What has been discussed in this research should probably stimulate the scientific and professional operators in the real estate sector to reflect on the need for a most appropriate interpretation of the phenomena that occur in the price formation in specific conditions, in which the oligopsony market form could be recognized. In a historical time characterized by a high volatility and complexity typical of the post-modern age, the appraisal discipline also has the task of proposing solutions capable of responding coherently to the needs of the changing society. It has to reconcile the needs of systematization and schematization recalled by the International Valuation Standards with the practical risk emergencies: although the valuers are appropriately learning to control and monitor these conditions, they could be further investigated from an economic point of view.

**Table 3** Descriptive statistics of the divergence between detected asking prices and assessed asking prices for all the microzones of the city of Cosenza

Microzone	Data (n°)	Min value (%)	Max value (%)	Average (%)	Std. deviation (%)
<i>B1</i>					
Small	22	0.70	85.12	29.40	22.65
Medium	74	0.22	310.42	32.63	105.22
Large	44	0.03	68.20	18.44	16.41
<i>B2</i>					
Small	2	6.31	6.74	6.53	0.30
Medium	5	9.18	73.44	36.30	24.02
Large	5	20.22	49.27	31.99	10.60
<i>C1</i>					
Small	24	1.31	302.44	43.42	62.40
Medium	87	0.44	144.34	26.30	23.43
Large	40	0.72	88.77	25.11	20.47
<i>C2</i>					
Small	7	2.87	38.87	21.28	12.99
Medium	10	3.35	103.70	39.16	30.78
Large	3	26.90	175.81	79.85	83.25
<i>D1</i>					
Small	11	6.14	79.11	33.18	20.76
Medium	41	4.82	168.09	35.79	35.06
Large	14	7.82	100.30	30.55	24.73
<i>R2</i>					
Small	4	4.29	101.40	40.04	42.56
Medium	–	–	–	–	–
Large	6	0.16	26.69	13.78	10.24

The case study analyzed has pointed out how the economic crisis has considerably reduced the amount of demand, which appears significantly lower than that of supply. It is not surprising that there is a very large number of properties supplied on the market with long exposure times in the face of very low demand and with limited availability to purchase in relation to the selling prices. These are conditions that confirm that some real estate markets are closer to structure of oligopoly on the hand of the demand, or rather of *oligopsony*. Furthermore, this contingency has determined that the asking prices, on the one hand, could be very far from the final selling prices, on the other hand, could be completely disconnected from the local market conditions, by creating a difficulty of the price leveling and, consequently, the impossibility to implement an appropriate assessment method based on the comparison paradigm.

The research has highlighted the cogence, in the assessment of the property market values, to properly work on the market structure, in order to specifically define the



characteristics of the supply and the demand, not only from a descriptive point of view as it can be ordinarily recognized in the scientific reference, but also from a quantitative one, in order to adequately involve in the market value provisions other factors, e.g. the weight and the effects on the future trends of the socio-economic variables. In fact, the assessment procedures are mainly focused on the elaborations on the technical and physical factors of the properties, probably underestimating the incidence of socio-economic variables, such as people's incomes, motivation to sell and buy, composition of households, time spent at home, etc., especially in specific conditions in which new market structure can be identified.

Therefore, future research should focus on the operational procedures to be used in specific contexts, by defining practical tools able to aim at new evaluation frontiers.

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