

Axiology of the historical city and the cap rate

The case of the old town of Ragusa Superiore

Salvatore Giuffrida*, Vittoria Ventura**,
Maria Rosa Trovato***, Grazia Napoli****

parole chiave: historical urban fabrics,
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Abstract

The study deals with the role that real estate market and appraisals play in the enhancement of the urban historical fabrics, according to the logic of the income approach.

The articulation, heterogeneity and plurality of the real estate stock of the historical city, the multiplicity of the relationships between values and prices, the complex dialectic stock/stream, the heterogeneity of the financial situations of the economic actors interacting in the market, encourage different approaches to the real estate investment that this study suggest to explain from the point of view of the capitalization rate.

The convergence of contextual values and unexpressed potentialities on one side, and the difficulty to coordinate the distortions caused by the liquidity injection in not structured real estate markets on the other side, involve the science of valuation in the field of territorial and urban wealth. In such ground Valuation science supports the decision making about the relationship between the real estate market rules and the urban regeneration processes and, on a more general level, about the question of the relationship

between the speculative pressures, and the restrictions imposed by the administrative authorities by means of taxes and subsidies.

The proposed study has as background some elements of the theory of capital, which explain the operators' decisions to hold or sell properties having an uncertain economic and monetary situation, due to the tendency of repair costs to prevail on the real estate market values.

The case study regards the historical center of Ragusa, where the wide dimension of the real estate patrimony and its heterogeneity highlight the distinction between object/performance-based characteristics and economic, monetary, financial features. The former concern the income involving the comparison appraisal, the latter concern the capitalization rate involving the income approach.

The application is based on an accurate analysis of a sample of 130 properties appropriately characterized from the point of view of the total value of the historical urban fabric, and then classified into homogeneous groups in order to deepen the relationship between values and prices.

1. INTRODUCTION: CITY, CAPITAL, AND EVALUATION SCIENCE

1.1 Real estate asset and the historical city

This study is framed in a more general research commitment that has involved for a long time the historical city in the perspective of its preservation. It

contributes to form a general model supporting the axiological interpretation of the historical urban fabrics, of the motivations of their value and the corresponding possibilities and conditions of *being worth* in a period of rapid reinterpretation of:

- the role that the historical centres assume in the in the social life;

- the interest that they assume for the politics and the national economy, and, accordingly, for the new functions that they are supposed to develop;
- their “beyondness”, i.e. the ability to exceed the contingent reasons of their spatial (functional) dimension and of their temporal location between past and present.

A period in which, more and more, the historical city remains the place in which the needs are transfigured in desires, and nature and artifice are identified in the “augmented reality” of a social-urban sub-system strongly recognizable for formal invariants, symbolical objects, induced life-style, exhibited as specific “distinctive marks”.

If it is true that in the social communication central location is definitely a status symbol, a fortiori in the economic communication, and especially in real estate market, location has had a decisive impact on the destiny of historic cities, for better or for worse.

Real estate is one of the most resistant forms of the wealth in the process of progressive accumulation of the social product surplus; in the symbolic dimension of the historical city this surplus “thickens” in different recognizable entities (architectural units, blocks, urban contexts), becoming “icons”, a status that consolidates this architectural shapes as capital shapes able to capitalize a greater number of incomes: the capital value has ever been the ability to absorb part of the “anomalous waves” of the economic cycles: the real estate stock of the historical city “is” value more than any other form of capital.

An “icon” is an object able to be worth as itself, to embody value regardless of any term of comparison and any cause, like the income; in this case, real estate itself becomes the term of comparison for other assets, the invariable unit of measurement of value as well as money. Being an icon doesn’t mean having an intrinsic or natural value – like the primary goods – but being able to capitalize an absolute rent (Camagni, 1992; Brown & Matysiak, 2000), due to the specificity, rarity or uniqueness of the objects that are a physical support of this form of capital, and to the contextual conditions that enable this support to *being worth*.

Indeed, regardless the easy enthusiasm for the exuberance of the contemporary capitalism, and the unlimited trust in the potential of real estate in valuable urban contexts, the historical city can become the most suitable social-economic context in which capital, and its characteristics, can aim to the (collective) value rather than just to the (individual) interest.

In a similar perspective, “to be worth” means to be a fundamental and constitutive part of axiological and resistant dominoes that justify, legitimate and validate, somehow self-referential, processes of urban preservation; “to be worth” means to be demanded in the present state in the reasonable perspective in which value complements “monetization” and “capitalization”: the

first one takes account of the relationship between different assets by means of horizontal comparisons along the “axe of the simultaneity”; the second takes into account of the relationship between different times by means of comparisons along the “axe of the successions” (Rizzo, 1999) in which the same kind of occurrence (the capital) exhibits its own capability to be worth.

In these conditions real estate asset contributes to found a specific ethics (in economy) and aesthetics (in architecture) (Allen & Lintott, 2007) of the historical city, as well as to resolve the contradictions between functional and formal order, between individual/instantaneous and collective/permanent utility, between opportunity and responsibility, between income value and property value, involving and selecting economic actors prepared and willing to the “best-practice of low capitalization rates”. It supposes major investments in the physical preservation of the asset, harmony with the urban identity, low income claims, concern in the long run integrity of the capital asset.

This approach doesn’t change at the urban scale in the cities where, according to the logic of cap rate, quite different urban policies divide the high valued historical centres to be protected (low cap rate) from the external areas to be transformed (high cap rate).

Some insights and clarifications deserve the “low-value density” historical cities.

Here, unlike the previous ones – where only the micro-densification interventions elude the strict protection rules – the low market values make profitable just the radical transformations supposing reconstruction and cubage increase, which causes the definitive formal impoverishment, however unjustifiable also in poor typological and morphological contexts.

The central idea of the research including this study is the contribution of Evaluation science in the formation of a conscience of the value of architectural and economic “low tension” contexts. This issue is coherent with the specificity of our discipline, which conjugates positive and normative approaches, telling with consistent analyses and critical reasoning *how things are*, and with design and programmatic awareness *how things should be* in the perspective of value (as epistemic category). The critical reasoning concerns to the combination between judgments of fact and value judgments, the programmatic conscience concerns the practice of the judgments of merit.

1.2 Evaluation epistemology: the capitalization rate

Regarding to the cross-disciplinary attitude performed by Evaluations science, one of the principal contact points with the sciences of architecture is the notion of patrimony. From our perspective, it is a topical occurrence, the epitome of inversion of the causal and semantic relation between value and price.

Architecture sciences consider the architectural

patrimony a general “idea” overarching his specific declinations (real estate and building patrimony); whereas from the point of view of the science of the evaluations, the architecture is an (although complex) economic entity and its characteristics just contribute to the real estate value. Cap rate matches the two perspectives.

Cap rate compares the net operating income of an asset with its capital value. The resulting percentage and its variation can appear scarcely significant if it is not considered, e.g., that the decrease of the cap rate from 3% to the 2% correspond to an increase of 50% of the value, for the same income.

Therefore, the value of a property only partly depends on income and just in some conditions and in some contexts: since a real estate property “is” both value and income, in an advanced capitalistic society and in a urban context with strong identity, and since these two quantity (value and income) can vary independently of each other, the capitalization rate identifies the specificity of the asset, its monetary, financial and economic profile. The relationship between these two heterogeneous quantities (stream and stock), assumed as distinctive mark of a real estate investment, assigns to these assets (through the actors of this market) an implicit responsibility, particularly referring to the historical city:

- 1) the lower the cap rate the more preservation prevails on transformation and vice versa;
- 2) a low cap rate trend is an index of the ability of properties to increase in value;
- 3) this ability is diversified depending on: a) the economic-financial stability and the generalized trust in economy; b) the characteristics of the local urban context encouraging the profitability of the real estate investment.

In conclusion, the conflict between architectural heritage (legacy) and real estate (opportunity) is a (urban) social-economic and politic matter: the integration of the natural (functional) and the economic (symbolic) orders can be achieved at the level of the social order as a result of a easier communication between social sub-systems, sharing codes and programs. In fact, the streams of goods and services produced in the natural order are turned in capital in the economic order by means of money; in the social order, the ability of capital to reduce uncertainty can be consolidated in a formal order (the architectural-urban identity of the historical city), by means of an articulated and flexible local taxation and a prudent administration of the public real estate patrimony.

Evaluation science identifies its epistemic specificity in the income approach (Forte, 1968) that we assume as the most meaningful application due to the stock/stream relation representing a time dimension, i.e. the capital factor.

Cap rate turns a continuous, unlimited, and constant stream of (net) incomes into a fund of capital value. His inverse, the cap factor, is the number of annual incomes corresponding to the capital value of a capital asset. The capital-value depends on the size, certainty, and continuity

of the income; the market value is the image of capital-value as represented in the economic communication.

The relationship between market value and capitalization value is not simple: they coincide only in individual rationality conditions within a competitive market. The market value reflects a general trend, the income value takes into account also the individual expectations. The first one dominates in homogeneous, active and transparent markets; instead, the individual determination prevails as much as the uniqueness of the assets consolidates the hierarchies of preferences, in presence of a large monetary mass looking for capital gains. In the second case, the market value is the ask price, the capitalization value is the bid price taking into account the bullish or bearish expectations.

Accordingly, the capitalization value is the market value plus the speculative (not manifested or implicit) component.

Linguistics teaches that the unspoken words are the most important, (Lo Piparo, 2005), the only ones, in some cases, to be considered, because of the communicative advantage that they give to those who are able to “communicate by means of implicatures” (Volli, 1994).

In economy, this asymmetry corresponds to the competitive advantage due to the ability to deal with, – and successfully manage – asymmetric information.

1.3 Topics and targets

Consequently, cap rate is a complex index, as it is at the same time a spatial, temporal and social solidarity rate. On one side it reflects the structural condition of an economic asymmetric communication, on the other side it helps to reduce this conflict: at the level of the real estate capital, where the individual creative energy prevails; at the level of the urban capital, where community addresses this energy in complementary and coalescent forms of the social capital.

Now, in the more valued historical cities, the real estate asset complements and supports the contextual quality using its ability to accumulate value to be successively released; on the contrary, in the smaller and less valuable towns, the capital value is influenced, and affected by the destiny of the context that, abandoned and jeopardized, irreversibly declines getting into the “poverty trap”.

Due to the difference between stock-value and income (as economic categories), the relative increase of the first one than the second modifies the ability of the architectural real estate patrimony of the valuable old towns to capitalize a greater number of incomes, growing in time and space and involving new economic actors.

Conversely, in the minor old towns, the riskiness of the expected income streams, the low affordability of the housing (Napoli *et al.*, 2016), the higher renovation costs and the progressive loss inhabitants reduce or cancel any possible “beyondness”.

According to all these suggestions, this study concerns the different components of the real estate asset description, basing on a detailed analysis of a market sample of properties localized in the historical centre of Ragusa Superiore. The mentioned components are: the utilitarian one, dealing with the concrete value; the income, concerning the value of profitable investment; the liquidity, that gives rise to the speculative value. These three components have been related to each other by performing two types of cluster analysis (by nature and by values), that aim at representing, with the help of several maps, the way the urban capital is reflected in the real estate capital.

2. MATERIALS

2.1 The historical centre of Ragusa Superiore

Ragusa is one of the eight cities of the Val di Noto (the administrative district corresponding to the south-oriental Sicily in the Islamic age) included in the UNESCO World Heritage List, due to the innovation of their urban layout, the architectural value of the late-baroque monuments, the overall value of the urban fabric. This historical centre, after the destruction caused by the earthquake in 1693, has been reformed as a result of the social reconfiguration of the city, which is divided in two parts: Ragusa Ibla, the original urban area rebuilt by the feudal nobility that introduced architectural and late-baroque patterns inside the pre-existing medieval urban fabric; Ragusa Superiore, where the emerging middle class arranged a new urban nucleus according to a rectangular grid structured by two main perpendicular roads. The different dimension of the blocks allowed the settlement to adapt to the orography (AAVV., 1991; Carusi & Perra, 1994) (Figure 1).

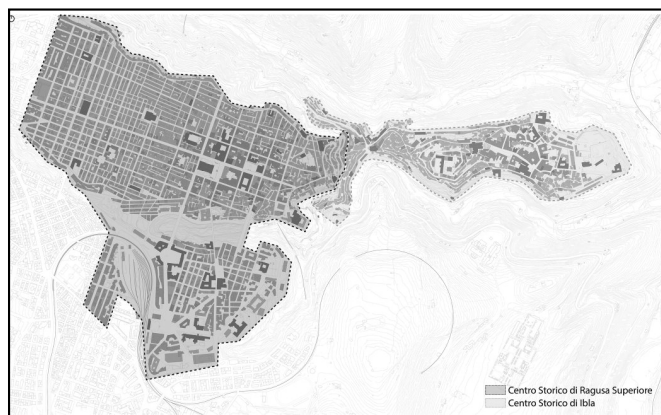


Figure 1 - Ragusa and the two historical centers: on the top left Ragusa Superiore, on the right Ragusa Ibla

The urban events, that led to the characterization of Ragusa Superiore in its present form, have been intertwined with the second half of the 70s building pressure that gave rise to different tampering with the

eighteenth-century fabric, and the original urban landscape, and more recently to substantial dropout phenomena with the transfer of residential and commercial activities towards more peripheral areas for new housing development.



Figure 2 - The old town of Ragusa Superiore. Top: via Roma and San Giovanni Battista Cathedral; down: Corso Italia

In similar historical centres, characterized by low demand for location – due to functional deficiencies and resistance to the basic building transformation – some forms of implicit inequality occur because of two distinct and converging circumstances: renovation costs prevail on market prices; the urban quality prevail on the architectural one. Both converge causing selective abandonment, and trigger urban necrosis processes definitely affecting the urban identity despite the urban policy committed in the implementation of the Detailed Renovation Plan (Ventura *et al.*, 2015; Ventura & Giuffrida, 2016).

2.2 Market survey. Data and preliminary analyses

A market survey has been carried out on two samples of real estate properties, for sale (75 data) and for rent (55 data), within the historical centre of Ragusa Superiore.

The preliminary analyses (characterization and early correlation between values and prices in figure 3; between values and rents in figure 4; frequency analysis in figure 5) describe the samples of real estate properties on the basis of 37 qualitative attributes grouped, according to a three layers dendrogram, in five principal attributes, progressively specified: extrinsic k_e , intrinsic k_i , technological k_t , productive k_p , and architectural k_a characteristics. The valuation of the quality of the properties from the point of view of each characteristic, performed according to a tested and consolidated methodology (Giuffrida, 2012; Gabrielli *et al.*, 2015, 2017;

Giuffrida *et al.*, 2015a; 2015c), is expressed in a standard scale from 1 to 5 (from the lowest to the highest level of quality) and, subsequently, it has been standardized by the “Z-normalization”, that leads a random variable, distributed according to a mean M and variance s^2 , to a random variable with a “standard” distribution, i.e. zero mean and variance equal to 1.

Tracing upwards the dendrogram, 37 scores were aggregated into five scores (corresponding to the aforesaid characteristics), in order to simplify the description of each property and to facilitate comparisons and groupings.

Finally, grouping the scores of the five characteristics – weighted on the basis of the coefficients of the multiple linear regression function – an aggregated index of quality k^* has been related to each property. This index allows an early evaluation of the coherence of the description of the sample through the relationship between the dependent variables (prices and unitary rents, per room and per m^2) and the independent variable (k^*). The representation also includes the dimension of the properties in order to underline the effect of the increase of the property size on the unitary values (Figure 3).

A further analysis concerns the probability density function of k^* , unit prices and specific k scores, representing the way the sample heterogeneity grows as the above values classes thicken (Figure 5).

3. METHOD

3.1 The real estate capital and the capitalization rate

Based on the above sample analysis, the paper aims to provide a structured body of knowledge from which the economical-real estate profile of the building patrimony of the historical center of Ragusa Superiore can be deduced in the light of the main assumptions of capital theory (Rizzo, 1999; 2002; 2013) exposed in other studies (Giuffrida, 2012; Giuffrida *et al.*, 2015a; 2016), and shortly summarized below:

1. the value of a capital asset, as investment from which income and capital value earnings are expected, depends on:
 - a. its temporal shape and dimension, namely the entity, distribution, and duration that it can deliver;
 - b. its shape and monetary dimension, namely the ability to motivate transactions above (*crescendo*) or below (*diminuendo*) of the current or ordinary prices;
2. this ability depends on the relationship between implicit and explicit liquidity – which is considered a rate of propensity to hoard:
 - a. the explicit liquidity is the ordinary income;
 - b. the implicit liquidity is a sort of psychological income

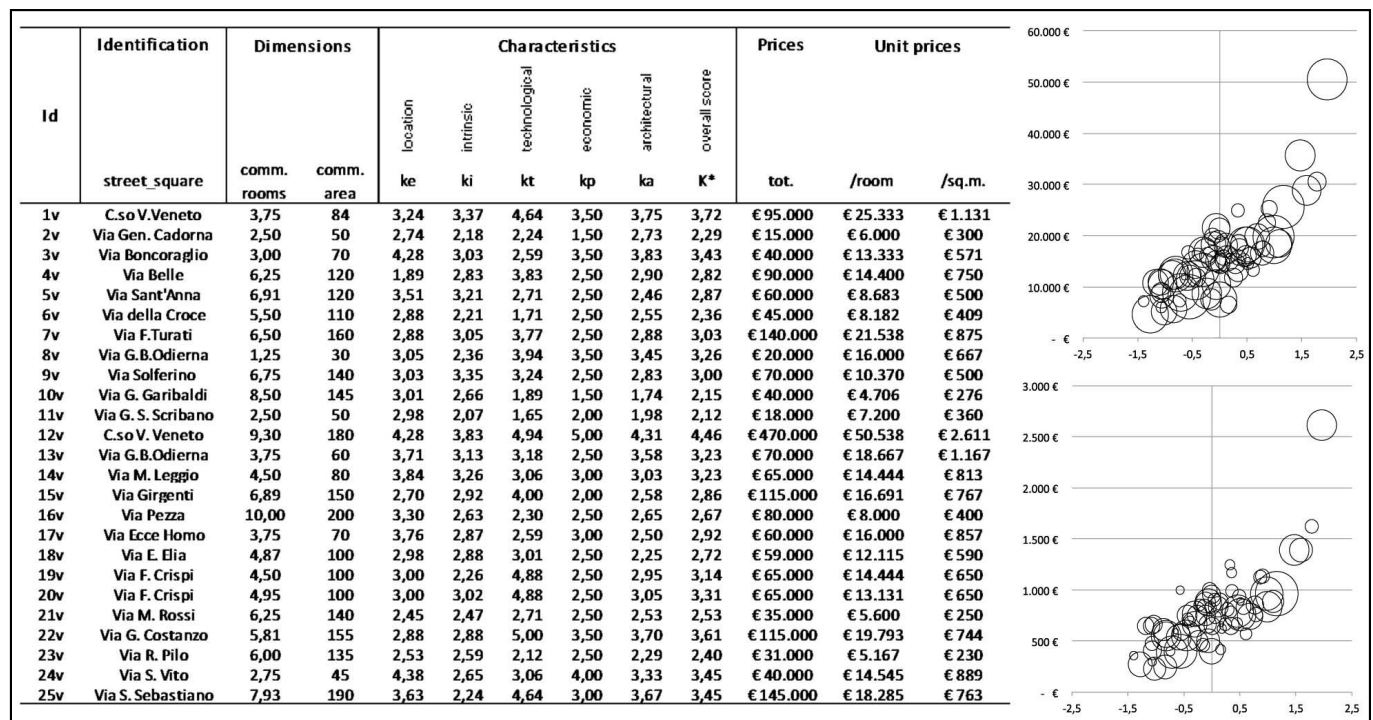


Figure 3 - Synthesis of the market survey: sample of the properties for sell (elements from 1 to 25, omitted the other 50) and early correlation between unit price (per room, top, and per sq.m, low) and k^*

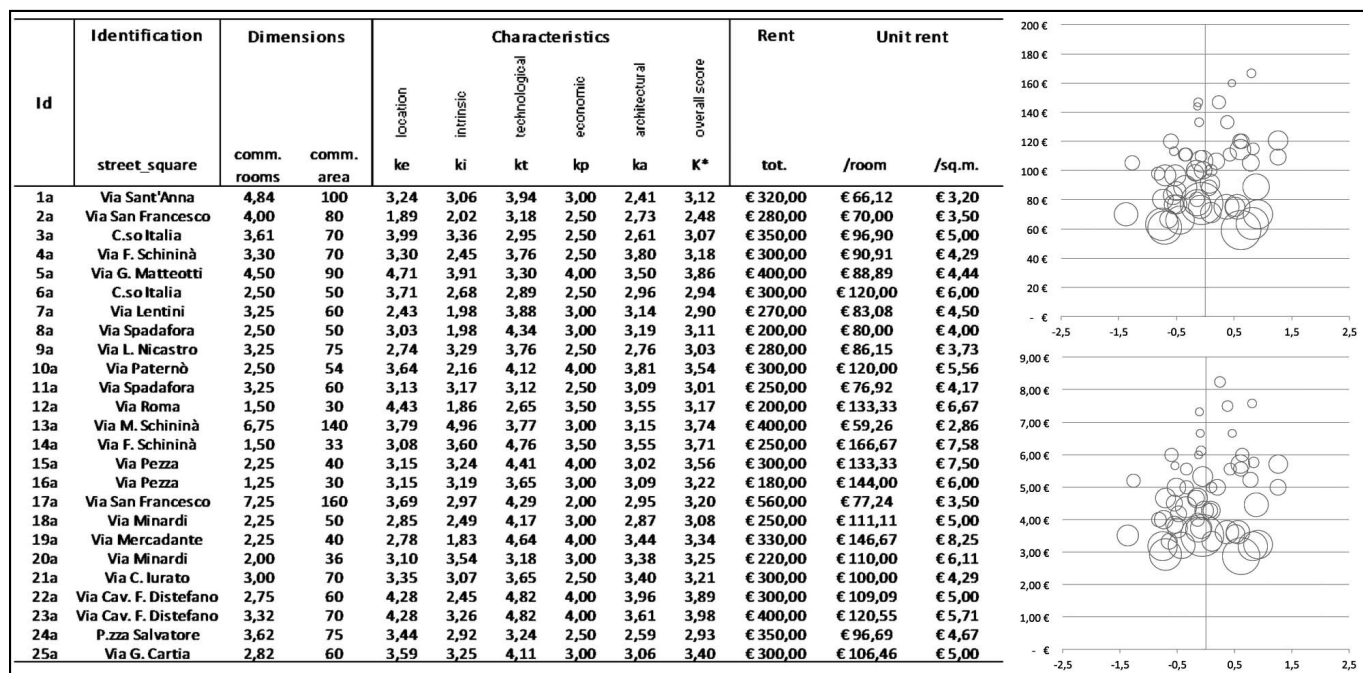


Figure 4 - Synthesis of the market survey: sample of the properties for rent (elements from 1 to 25, omitted the other 30) and early correlation between unit rent (per room, top, and per sq.m, low) and k^*

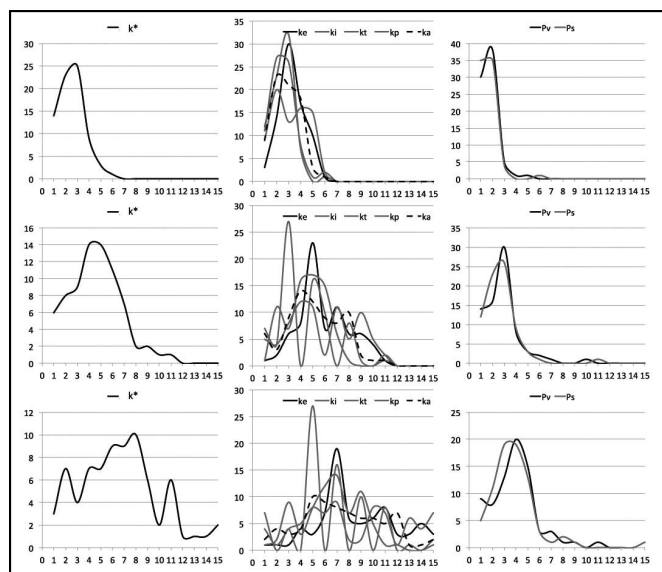


Figure 5 - Sample distribution analysis

that compensates the gap of explicit liquidity when it, intentionally or unintentionally, is not earned. In the first case, the owner is motivated to maintain unproductive the asset with the purpose of preserving its potentialities to provide an income. In the second case, he keeps the ownership of the asset despite the payback period extends, due to the income decrease. The capitalized value of the implicit

liquidity stream corresponds to the expected capital gain; this expectation pushes the demand price over the supply price and, as a consequence, the market viscosity grows. In some cases, this viscosity turns into paralysis: in this respect, the real estate capital develops an anti-cyclical function with respect to the economic fluctuations, accumulating the liquidity lost from other assets or from the money;

- the temporal form/dimension is measured by the coefficient of capitalization that corresponds to the "average period" of the "expected stream", i.e. the specific asset: if it is higher than the average period of the "standard stream" (i.e. the inverse of the standard capitalization rate), then the property has a "crescendo", otherwise it has a "diminuendo". In case of "crescendo/diminuendo" the asset capitalizes a greater/smaller number of incomes than those capitalized by the standard asset; an asset having a *crescendo* is a "money-good", and consequently is a value reserve taking part to the "wealth-effect" (Rizzo, 2002); vice versa an asset having a *diminuendo*;
- the *crescendo/diminuendo* can concern the value, the income, and the liquidity; in this respect the capitalization rate is different from the rate of profit because it capitalizes the not delivered incomes.

3.2 General procedure

The general objective of defining the "monetary profile" of the real estate patrimony of the historical center of

Ragusa Superiore is achieved, starting from the market analysis, calculating the capitalization rate of each property of the sample. The procedure is articulated in four stages.

1. The first stage, aimed at distinguish the structural aspects of this market, concerns the delimitation of segments within which the real estate properties of the sample can be included basing on their characteristics: two types of "cluster analysis" have been applied for this purpose.

1.a The first one is a classification "by nature", carried out by taking into account some meaningful characteristics of the property, concerning the urban identity.

1.b The second one is a classification "by scores" and consists in a "fuzzy-cluster analysis" (Anderberg, 1973; Everit, 2011; Trovato, 2012) on the basis of the quality of the properties from the point of view of the five principal aforementioned characteristics.

2. The second stage concerns the calculation of the costs for reducing the performance gap of the properties with regard to their maintenance state.

From the point of view of the public interest, the necessity to perform prudent rehabilitation operations in the poorest districts and on modest architectural value properties raises concerns regarding the destiny of urban contexts whose value depends on the overall consistency of the architectural language elements and meaningful plots.

From the point of view of the private interest, the state of preservation affects the bid price both in a quantitative and objective sense (the retraining costs) (Taltavull & Gabrielli, 2015), both in a qualitative and subjective sense (it influences the perception of the overall quality of the property).

In both two perspectives, the real estate market analysis is part of the valuation of urban investments ((Napoli, 2015a), and especially in public decision making the logic of cap rate is consistent with the general interest.

According to the income approach, a parametric cost analysis has been carried out in order to calculate the renovation cost of each property. To this end, elsewhere (Giuffrida *et al.*, 2015b; Ventura & Giuffrida, 2016) we identified three main categories of intervention divided

into three subcategories, depending on the conservation of the property status (mild, medium, strong); subsequently the architectural units were classified in 22 building types (Figure 6) according to the size, the number of floors, the exposed walls, roofing, architectural characterization etc., and the synthetic calculation of expenditure was carried out for each type and for each subcategory; then we identified 66 parametric costs to be applied to the properties depending on the class they belong to.

3. The third stage concerns the calculation of the expected profitability of each real estate property of the sample in reference to the ordinary income. To do this, the profile of the cluster, to which each real estate property for sale belongs, is defined: for each cluster, it is observed the range within which the score of each characteristic varies; subsequently all properties for rent, corresponding to each cluster profile, are selected and gathered in clusters (of properties for rent) that are similar to the previous clusters (of properties for sale).

4. The fourth stage concerns the calculation of the capitalization rate of each real estate property for sale, obtained dividing the net income of each property, calculated applying the cluster analysis as described in the previous point 3, by the ask price. It is also proposed a variation internalizing the renovation costs into the ask price, and consequently considering a higher income, because of the improved status of maintenance. This variation corrects a basic flaw of the previous hypothesis: in fact, the real estate properties of the sample for sale, which are not in habitable conditions, are not able to generate an income, so it would be incorrect to attribute to them the income calculated with the common multiple regression model.

3.3 Fuzzy cluster analysis

In a general sense, the representation of the data that are characterized by a certain degree of inaccuracy can't be produced in a comprehensive manner with the classic crisp approach, but it is possible to achieve a better representation of them by having recourse to the theory of fuzzy sets.



Figure 6 - The 22 building types

The fuzzy cluster analysis (Zadeh, 1977) allows grouping the different buildings units by evaluating the degree of membership to each of the types which have been upstream defined, so that each unit can be connected to one or more urban layout.

This particular technique is considered more suitable to the context of the historical city, compared to those hierarchical (agglomerative or divisive) which on one hand allow retracing the hierarchy upwards and downwards (Hepsen & Vatansever, 2012; Giuffrida *et al.*, 2014, 2015b), but they difficultly return the “generous abundance of axiological layers” on which the properties could take place.

In the fuzzy clustering methods, the degree of membership is expressed by a function that takes values in the interval $[0,1]$, which allows achieving a representation of the data that maximizes the ability to extract information content from them.

Over the years, the interest in these methods will have been developed precisely to meet this specific need.

It defines a function values j (where j is the number of groups of the partition or covering) that associates each unit i , j numbers each of which indicates the degree of membership of the i_{th} unit to the j_{th} group; M is also the number of known cluster.

The generic element of a matrix U of the membership degrees, which has a size $N * M$ represents the numerical value of the membership function of the i_{th} element to the j_{th} cluster.

The fuzzy clustering model uses data that have been observed in reality and therefore data not fuzzy.

In an ideal situation the data can be assigned to perfectly separate clusters, while in a situation closer to reality it is more likely that the data are distributed in such a way that it is difficult to attribute them to a cluster or another. Factors that characterise a clustering technique are: the similarity measures; the cluster detection algorithm.

4. RESULTS

4.1 Clustering by nature

The early analysis carried out in order to verify the coherence between unit market prices and quality classes is articulated according to three distinctions:

1. *Typology* (Figure 7). It surveys the relationship between economic values and urban fabric hierarchies; basic type forms the first group, minor palaces the second one, historical palaces the third one, and contemporary buildings the fourth one.

The following figures show: location of the clusters; unit prices distribution – €/room and €/sqm; minimum, average and maximum prices per room and per square meter of each cluster, k^* .

2. *Maintenance state* (Figure 8). It analyzes the relationship

between prices and conservation state. The groupings distinguish between buildings that need: no intervention, current maintenance, extraordinary maintenance, and restoration.

3. *Architectural value* (Figure 9). It reaches the relationship between prices and quality of the architectural design by reference to unities having high, average, low, and null quality.

4.2 Fuzzy clustering

The fuzzy clustering, rather than clarify the spatial and economic characterization of the different types by nature, has made possible to delimit sub-markets by combining the assumptions about the number of them, and the quantitative characterization of the attributes which have been represented in scales of standard scores.

Subsequently, different assumptions about the submarkets (from 2 to 5) have been made, and the results are presented in Figure 10

The division into four clusters has been considered the most significant by analysing the differences between the buildings in the various clusters (Figure 11). The analysis on five clusters, in fact, shows very mild degree of membership in most of the sample and then returns a negligible significance of the grouping.

As mentioned, the degree of membership allows us to identify discontinuities (gaps) or overdeterminations (overlap) more or less marked in the structure of the sample (Gabrielli *et al.*, 2016); this allows us to build a trichotomy distinguishing between buildings that: 1. belong to a single cluster; 2. do not belong to anyone because the degree of membership to different clusters is almost similar; 3. belong to more than one cluster because the degree of membership to more than one cluster is significant (Figure 12).

4.3 Renovation costs

Since the typing of the Architectural Units mentioned above, synthetic spending calculations were performed for each of the 66 classes types/subcategories of intervention. The model (Tab. 1) shows in rows the single works grouped in a dendrogram, and in column the categories of intervention. The unit prices come from the Regional Price List of Public Works of the Sicilian Region (2015). The cells contain the percentage of the property affected by the work depending on the category of intervention.

On this basis, a parametric renovation cost has been related to each real estate property of the sample, according to the 66 abovementioned classes (Table 2).

4.4 Capitalization rates

The overall value of the investment constitutes the terms in respect of which the expected income of a real estate

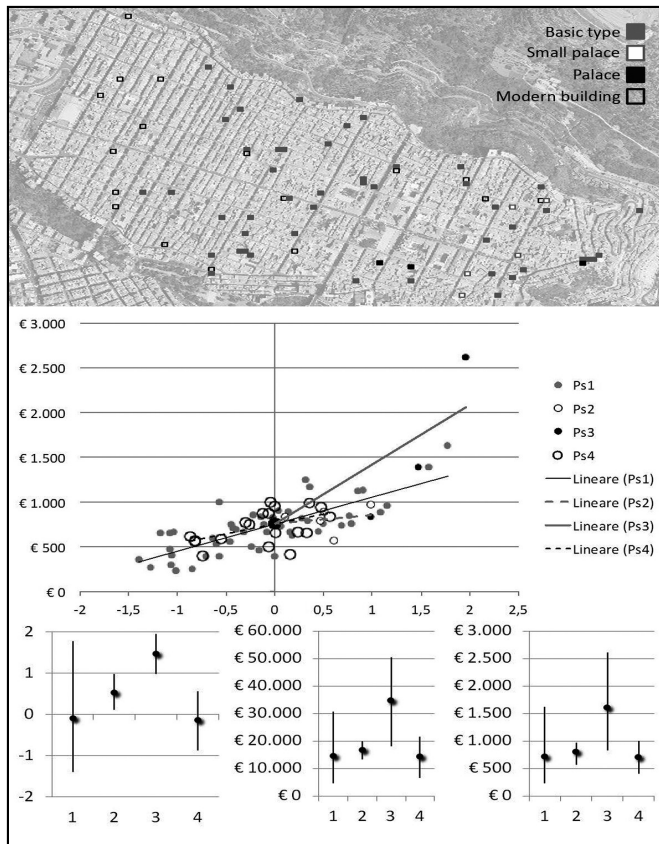


Figure 7 - Clustering by types

property is compared, from the point of view of complementary productive (Manganelli & Morano, 2005) and speculative uses. The renovation of the real estate property, in fact, conditions the rent profitability, and contributes to make a real estate property able to attract liquidity flows, which are from positive externalities of the urban renewal of the Historical Center of Ragusa (that is a result of the Detailed Executive Plan, approved by d.d.g n. 278, 23/11/2012 D.R.U Published in the G.U.R.S n. 2, 11/01/2013) (Comune di Ragusa, 2012; Caruso e Perra, 1994).

When the unexpressed potential of an urban context receives a boost by a new planning, the expected real estate valorization is expressed not in explicit terms (income), but rather in implicit terms (expected *capital gain*).

A first screening of the inverse relationship between capitalization rate and overall quality (k^*) has been made by a simplified procedure (hypothesis 1), calculating, in comparison to all real estate properties for rent, the gross incomes of each real estate property for sale by a linear multiple regression function, in which the predictors are the five scores of the characteristics, k_e , k_i , k_t , k_p , and k_a (Figure 13).

The graph in Figure 13 shows a physiological fluctuation of the cap rate, from 6% to 1,8%, in many cases, on one side;

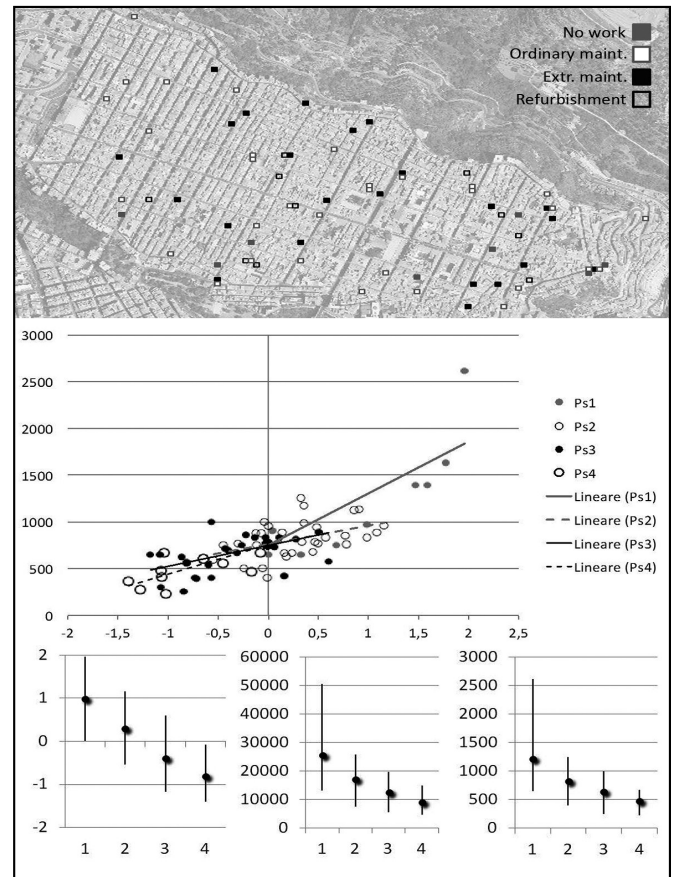


Figure 8 - Clustering by maintenance state

a sprawl of cases regarding low qualitative value and small properties on the other side. They are also characterized by very low market values in comparison to the incomes and by erratic values of the capitalization rates that vary from 6% to 12%. These properties mainly need to be renovated, so the calculation of their income is only theoretical because they cannot be rented. Accordingly, three changes are introduced:

- (1) to calculate the income in reference to the results of the fuzzy cluster analysis;
- (2) to increase the estimated renovation costs;
- (3) to increase the technological and architectural (decorum) characteristics scores as a consequence of the planned interventions of renovation.

Further layouts result:

- the first one, achieved by the change (1), leads to an erratic scatter, where it may be distinguished: the tendency of the best real estate properties to detach themselves from the main group, defining a clear decreasing trend; the tendency of the group of the poor-quality real estate properties to disperse themselves toward very high values of the capitalization rate (Figure 14);
- the second one, achieved by the changes (2) and (3),

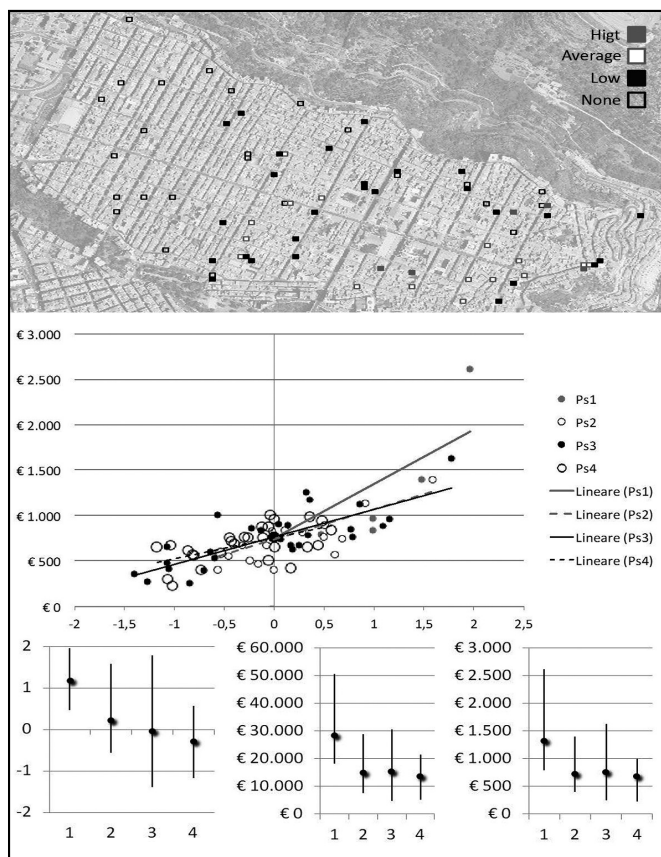


Figure 9 - Clustering by architectural value

leads to a general and compact decreasing of the cap rate: internalizing the state of the defects and the damages, the fluctuation of the capitalization rate decreases (from 4,5% to 1,8%) (Figure 15);

- the third one, achieved by all the changes (1-3), leads to a more articulated scatter, confirming a central trend and two other parallel trends, the lower is more structured whereas the higher is more fringed; moreover there are also some “tails” in the low value band of k^* (Figure 16).

5. DISCUSSION

The discussion of the results follows the order of the observations and elaborations of the collected data.

0. The preliminary analysis of the two samples presents: a just acceptable relation between unit prices and aggregate quality index (k^*) (R^2 is 0.65 and 0.61 in the prices per room and per square meter respectively); a relation quite erratic between rents and k^* ($R^2 < 0.1$ in both cases) (Figure 3-4).

This preliminary representation reveals criticalities also for the sample of the properties for sale, whose scatter thickens in the central part, showing a fluctuation of the unit price greater than 200%.

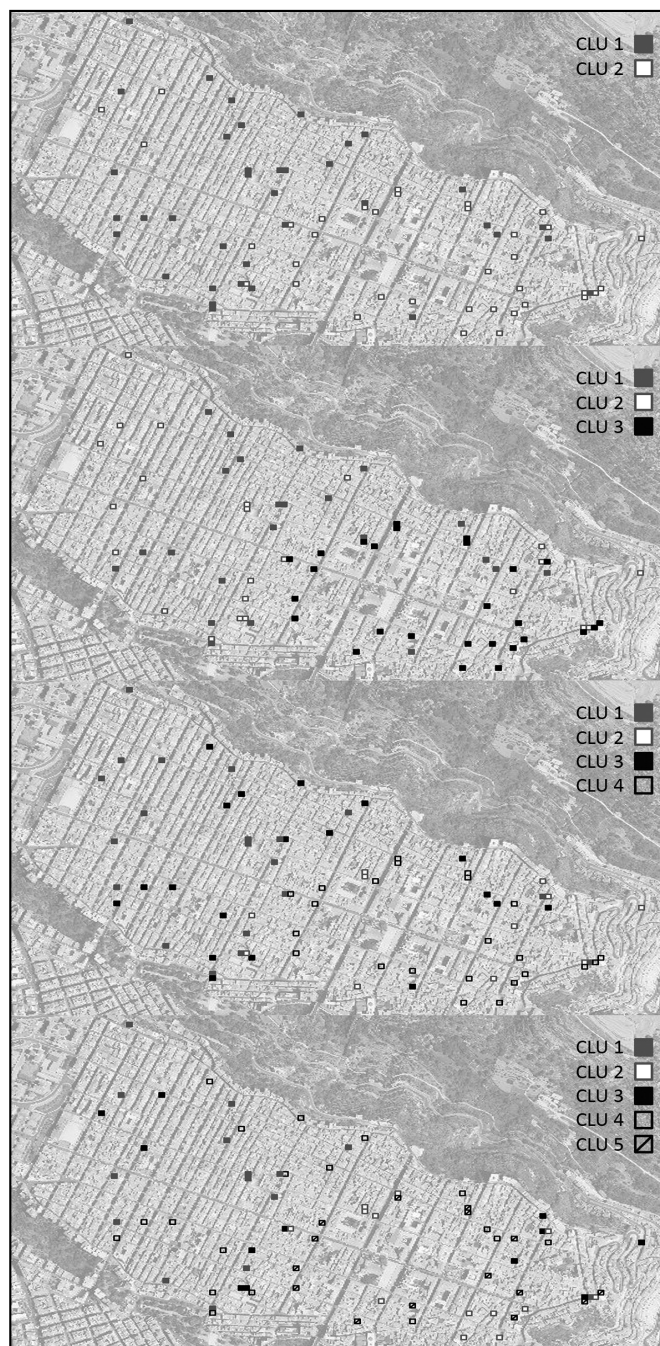


Figure 10 - Fuzzy clustering: localization of the clusters according to the four hypotheses from 2 to 5 clusters

The distribution of the sample analysis (Figure 5) shows that the more the classes of k^* and unit prices k are dense, the more the ripples are deep, especially those of the specific k (the characteristics taken individually). This shows how particular differences tend to offset in pricing. Furthermore, the probability density functions of k^* and of the unit prices are more compact and show the typical whale-shaped profile describing: a. the prevalence of

Table 1 - Model for Summary Calculation of Parametric Costs (items 1-33. Omitted items 34-70)

DESCRIPTION				INTERVENTION CATEGORIES													
				ordinary maintenance				extraordinary maintenance			renovation			conservative restoration			
				Nes	OM1	OM2	OM3	EM1	EM2	EM3	R1	R2	R3	CR1	CR2	CR3	
		SPECIFICATIONS	u m	0	1	2	3	4	5	6	7	8	9	10	11	12	
Demolition and reconstruction	Demolitions, loading, carriage and unloading to landfill, landfill	Floors demolition	mc	0%	0%	0%	0%	0%	0%	0%	20%	40%	70%	0%	40%	60%	
		Vertical structures demolition	mc	0%	0%	0%	0%	1%	2%	3%	10%	20%	50%	0%	32%	34%	
		Partitions demolition	mc	0%	0%	0%	10%	30%	40%	50%	70%	100%	100%	0%	40%	50%	
		Total demolition	mc	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Reconstructions	Floors and stairs reconstructions	mq	0%	0%	0%	0%	0%	0%	20%	40%	50%	60%	0%	40%	60%	
		Partial reconstruction of vertical structures	mc	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	34%	
Structural interventions	Masonry consolidations and structures making safe	Building construction	mq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
		Injections of cement or resins	mc	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	40%	60%	90%	
		Sew-unstitch	mc	0%	0%	0%	0%	2%	4%	6%	50%	10%	0%	40%	50%	70%	
		Chains and tie rods	n	0%	0%	0%	0%	10%	20%	0%	50%	75%	100%	45%	60%	80%	
		Concrete curbs	mc	0%	0%	0%	0%	0%	0%	50%	50%	100%	100%	0%	0%	0%	
Interventions on masonry	Structures rebuilding	Floors	mq	0%	0%	0%	0%	0%	0%	10%	20%	50%	100%	0%	40%	60%	
		Roofs	mq	0%	0%	0%	0%	0%	0%	20%	20%	50%	100%	45%	60%	100%	
		Masonry	mc	0%	0%	0%	0%	0%	0%	0%	10%	20%	50%	0%	0%	0%	
		Shared stairs	mq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
		Stairs	mq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Recovery works	Facades	Plastered surfaces cleaning	mq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	130%	0%	0%	
		Cleaning surfaces with friezes and eaves	mq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	130%	150%	190%	
	Gabled roofs	Roof covering dismantling	mq	0%	10%	50%	100%	100%	100%	100%	100%	100%	100%	60%	100%	130%	
	Systems	Standard sanitary	n	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	0%	100%	150%	
		Standard water system	n	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	0%	100%	150%	
		Standard electric system	vani	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	0%	100%	150%	
Window fixtures replacement	Flooring and closures	Pavings	mq	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	0%	130%	180%	
		Closures	mq	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	38%	130%	180%	
	Removing	Dismantling of external window fixtures	mq	0%	10%	50%	100%	100%	100%	100%	100%	100%	100%	0%	130%	130%	
	Supply and position	Supply and position of standard window fixtures	mq	0%	10%	50%	100%	100%	100%	100%	100%	100%	100%	0%	130%	180%	
	Interior plaster reconstruction	Removing	Plaster scarifying	mq	0%	10%	30%	50%	50%	75%	100%	100%	100%	100%	0%	50%	70%
			Loading, carriage and unloading to landfill	mc	0%	10%	30%	50%	50%	75%	100%	100%	100%	100%	0%	50%	70%
Landfill charges			mc	0%	10%	30%	50%	50%	75%	100%	100%	100%	100%	0%	50%	70%	
Plasters	Plaster	mq	0%	10%	30%	50%	50%	75%	100%	100%	100%	100%	40%	50%	70%		
	Indoor painting	mq	0%	10%	30%	50%	50%	75%	100%	100%	100%	100%	80%	130%	180%		

Table 2 - Parametric costs by type and by intervention category

building type	Type of works								
	Ordinary maintenance			Extra-ordinary maintenance			Retrofit		
	Degree 1	Degree 2	Degree 3	Degree 1	Degree 2	Degree 3	Degree 1	Degree 2	Degree 3
T1	€ 39	€ 91	€ 120	€ 225	€ 276	€ 356	€ 405	€ 563	€ 682
T1	€ 32	€ 74	€ 96	€ 184	€ 235	€ 315	€ 357	€ 502	€ 622
T1	€ 32	€ 56	€ 77	€ 150	€ 194	€ 260	€ 342	€ 492	€ 622
T1	€ 26	€ 42	€ 57	€ 117	€ 160	€ 226	€ 304	€ 443	€ 574
T1	€ 33	€ 69	€ 91	€ 173	€ 218	€ 291	€ 362	€ 517	€ 651
T1	€ 27	€ 55	€ 72	€ 140	€ 185	€ 258	€ 323	€ 469	€ 602
T1	€ 26	€ 50	€ 66	€ 132	€ 176	€ 244	€ 319	€ 463	€ 594
T1	€ 31	€ 63	€ 84	€ 162	€ 207	€ 276	€ 354	€ 506	€ 637
T1	€ 32	€ 60	€ 81	€ 159	€ 205	€ 271	€ 356	€ 509	€ 639
T1	€ 26	€ 45	€ 60	€ 123	€ 168	€ 234	€ 315	€ 457	€ 587
T1	€ 26	€ 49	€ 65	€ 130	€ 175	€ 239	€ 322	€ 467	€ 598
T1	€ 31	€ 61	€ 82	€ 161	€ 206	€ 273	€ 357	€ 510	€ 640
T6	€ 26	€ 41	€ 56	€ 114	€ 158	€ 225	€ 301	€ 439	€ 567
T6	€ 29	€ 50	€ 68	€ 135	€ 180	€ 248	€ 326	€ 470	€ 599
T6	€ 26	€ 48	€ 64	€ 127	€ 171	€ 238	€ 313	€ 454	€ 584
T6	€ 26	€ 49	€ 65	€ 136	€ 185	€ 256	€ 338	€ 485	€ 612
T6	€ 28	€ 47	€ 64	€ 132	€ 178	€ 247	€ 328	€ 473	€ 600
T2	€ 26	€ 54	€ 71	€ 140	€ 180	€ 251	€ 308	€ 453	€ 587
T2	€ 25	€ 51	€ 68	€ 135	€ 175	€ 243	€ 308	€ 451	€ 582
T2	€ 21	€ 40	€ 52	€ 108	€ 149	€ 217	€ 280	€ 416	€ 547
T3	€ 22	€ 45	€ 59	€ 126	€ 172	€ 250	€ 334	€ 468	€ 578
T3	€ 22	€ 43	€ 56	€ 123	€ 169	€ 243	€ 323	€ 447	€ 577

medium and medium-low values (k*) and unit prices; b. the presence of excellent properties, located in monumental buildings and privileged contexts, described by long tail of the curves.

This first analysis presents a varied picture of the urban context in which heterogeneous elements are coordinated in an overall recognizable structure, which the real estate market takes into account.

1. The search for a reasonable structure of this sample, able to reflect the value/price relationship of the urban context, suggested the use of clustering – by nature – based on type, maintenance state, and architectural value.

1.1 Clustering by types (Figure 7): a) the range of quality of basic types is wider than price range, and is a sign of a untapped market potential; b) the level of the average prices of three minor types compared to the high prices of valuable types is almost uniform; c) the level of values and prices of contemporary building is low.

1.2 Clustering by maintenance state (Figure 8): a clear

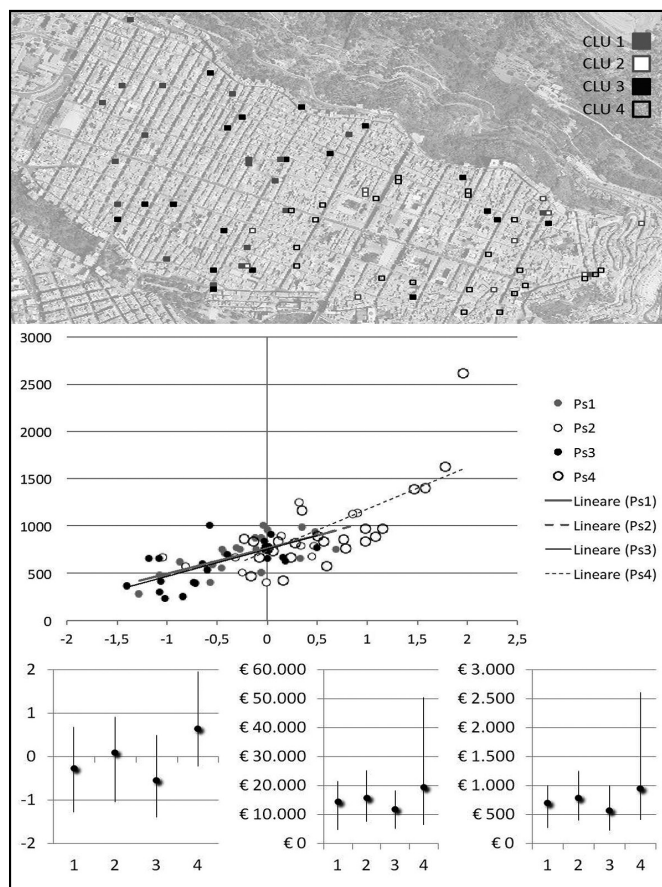


Figure 11 - Fuzzy clustering

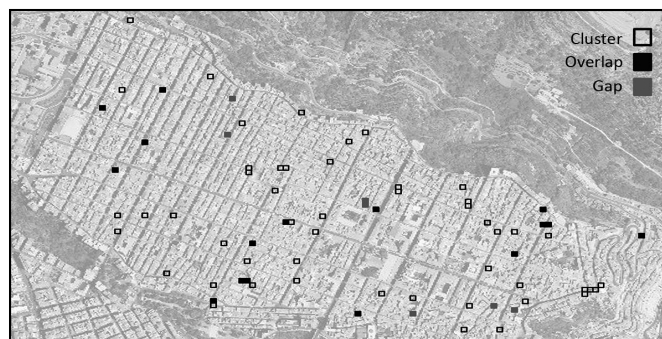


Figura 12 - Spatial distribution of the trichotomy: cluster, gap, and overlap

complementarity between price and renovation cost can be noticed; moreover, since the price range is greater than the value one, it follows that a good maintenance state significantly encourages real estate investments.

1.3 Clustering by architectural value (Figure 9): the result is similar to the one obtained by type from the point of view of the prices, in fact, despite the clear progression of values, only the high quality properties are really appreciated by the market.

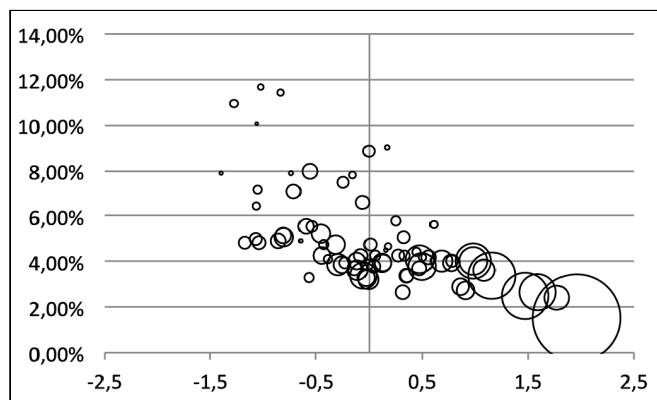


Figure 13 - Relationship between capitalization rate and index of united quality

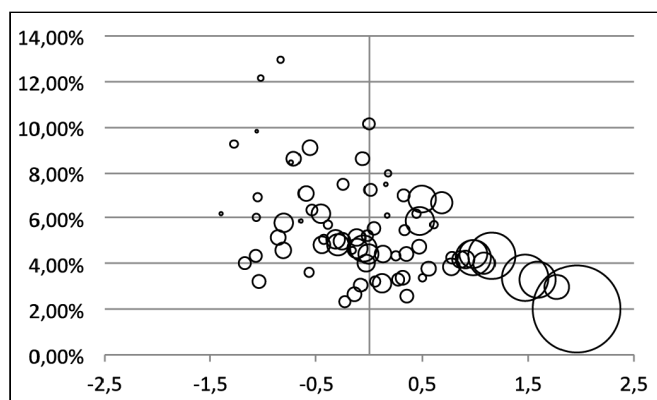


Figure 14 - Relationship between capitalization rate and index of overall quality (change 1)

2. The fuzzy cluster analysis (Figures 10-11) was performed:

2.1 to improve the correspondence between values and prices in distinct sub-markets. This analysis shows that the most adequate articulation in four clusters has a significant consistency. Two main clusters are identified in the lower layer comprising properties in peripheral areas, whereas the middle and the upper layers correspond to properties located in the more central areas (Figure 11);

2.2 subsequently, to use the degree of membership in each cluster, we distinguish: the elements definitely belonging to a single cluster (52 elements), those significantly belonging to more than one cluster (16 elements), and those whose degree of membership is similar for all clusters (7 elements) so that they are therefore excluded from the sample (Figure 12).

3. The analysis of the renovation costs (Tabs. 1 and 2) was performed in order to develop two different uses of the market survey, the support of the urban renewal policy (Napoli & Schilleci, 2014) and the regulation of real estate

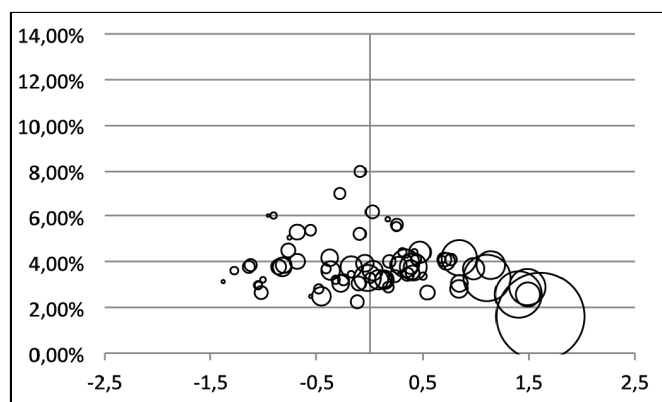


Figure 15 - Relationship between capitalization rate and index of overall quality (changes 2 and 3)

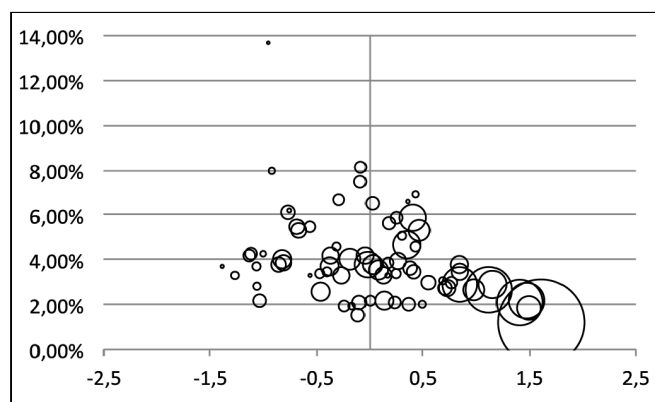


Figure 16 - Relationship between capitalization rate and index of overall quality (changes 1, 2 and 3)

investments, (Trovato, 2013). In both cases, the cost analysis is associated with the calculation and the mapping of the cap rates, as explained in the following point.

4. the calculation of the capitalization rates has been addressed to connect the issues of the historical city preservation with the economic ethics, supporting the positive relationship between: a) stock and stream values; b) spot and forward values; c) erosion and accumulation of the architectural and urban heritage value. Four different approaches have been performed:

4.1 the first one provides a preliminary representation that is consistent with the inverse relationship between cap rate and quality (k^*) (Figure 12). Nonetheless, the wide fluctuations and some out range values of the cap rate are not compatible with the logic of the real estate; this depends on two factors: the income of properties for sale has been calculated using the sample of properties for rent non-clustered; the calculated income is indiscriminately associated also to properties that need to be renewed and can not be leased at present;

4.2 if the income is calculated according to the profile of the cluster which each properties for sale belongs to, the apparent continuity of the previous trend branches into several little fragmented chains, while keeping a clear inverse relationship with high cap rates. It is important to note that the most valuable properties show a consistent and stable cap rate trend (Figure 13);

4.3 if the cap rates are calculated by taking into account also the renovation costs, the cap rates of low-quality properties are significantly reduced returning to a physiological range, while the others remain nearly the same. (Figure 14);

4.4 if the cap rates are calculated by dividing the income – calculated according to point 4.2 – by the price of the increased cost (4.3), some distinct decreasing chains appear (Figure 15). The central chain, slightly decreasing, seems to be the result of two opposing trends. In

particular, the implicit and explicit liquidity of low quality properties are combined in different ways: the upper chain is very frayed, while the lower one looks much more consistent.

6. CONCLUSIONS

This study about the real estate market of the old town of Ragusa Superiore, was performed according to the economic and architectural-urban logic of the capitalization rate.

The main aim is to analyse the coherence between values and prices: the first ones are concrete, related to the issues of city and architecture, and mainly aesthetical; the second ones are abstract, related to the reasons of politics and economics, and primarily ethical.

This dichotomy has traditionally caused conflicts and communication gaps between experts in architecture and economics in many fields, as academic, professional and institutional, even if these gaps have been progressively reducing.

Due to low tension of its real estate market prices, the historical centre of Ragusa Superiore is a significant case of the difficulty to start successful urban policies in the short term, contrary to the urban and economic contexts of the adjacent Ragusa Ibla, characterized by a more pronounced landscape and monumental values.

The four procedures applied for calculating the cap rate of the properties for sale refer to the capital theory based on “wealth effect” (Rizzo, 2002), according to which the capitalization rate is not an index of profitability (Simonotti, 2011) – to be calculated at the end of a set of observations, as the ratio of net operating income and price – but a “morphogenetic variable” (Napoli, 2015b) of the city.

The cap rate is a multifaceted and polymorphic variable (depending on economic, financial and monetary aspects)

which condenses how the economic actors consolidate the “current semantic” on one side and reconstitute a “new syntax” on the other.

In fact, they operate in the market making demanding choices (in episodic real estate transactions), affecting the system of the capitalization rates; In this way, they confirm

or deny the relationship between the implicit liquidity (Rizzo, 1999; 2002) (potential returns converted into capital gain) and explicit liquidity (current yields converted into extra income) of many capital forms as architectural and real estate assets in the rich, varied and ambiguous “shape field” which is the historic city.

* **Salvatore Giuffrida**, *Researcher of Appraisals at the Department of Civil Engineering and Architecture – Special Educational Department of Architecture – University of Catania*,
e-mail: sgiufrida@dica.unict.it.

** **Vittoria Ventura**, *Professional*
e-mail: vittoriaventura01@gmail.com

*** **Maria Rosa Trovato**, *Professor of Economics and Appraisals at the Department of Civil Engineering and Architecture – Special Educational Department of Architecture – University of Catania*
e-mail: mrtrovato@dica.unict.it

**** **Grazia Napoli**, *Researcher of Appraisals at the Department of Architecture University of Palermo*
e-mail: grazia.napoli@unipa.it

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