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Testing the use of Contingent Valuation Method in Real Estate Market: first results of an experiment in the city of Milan*

One of the most criticism in Real Estate appraisal processes based on sales comparison approach is the reliability of data about market prices of comparable properties. In this context, the use of evaluation methods based on hypothetical markets, most widely used in the field of the evaluation of environmental goods or cultural heritage, could solve that problem. It has been found that estimating the willing to pay (WTP) for a sample of goods with different features brings to reliable outcomes with negligible gaps by comparison with the values obtained by the more traditional real estate appraisal methods.

According to these general assumptions, the paper suggests the use of Contingent Valuation Method with the aim of replace in the appraisal models the market prices of a sample of properties with the WTP for the same goods.

Keywords: *contingent valuation
method, real estate market*

1. Criticism in real estate appraisal processes

In the field of real estate appraisal, the goal of the valuation process is to forecast the most probable value for specified properties. There are three commonly used approaches for determining value: the sales comparison approach, the cost approach and the income capitalization approach. Depending on the availability of data and the type of property being valued, the three approaches don't estimate the same value and they are not reliable in the same way. The appraiser has the task of reconciling the values according to his experience, to the accuracy of data and procedures and to the market conditions¹. Generally the appraiser decides to apply one or more of these methodologies according to the scope of the appraisal. One of the most criticism in Real Estate appraisal processes based on sales comparison approach is the reliability of data about market prices of compa-

* The paper is the result of a common elaboration of the three authors. More in detail, S. Mattia has developed the fourth paragraph, A. Oppio the first and the third, A. Pandolfi the second. The fifth paragraph must be ascribed to all the authors.

¹ The reconciliation methods vary from country to country. In the United States all three methods are used in most cases. In France only the sales comparison and the income approach are used. In Switzerland the final value is given by the weighted average of the value estimated by cost approach (1/3) and income approach (2/3). In UK appraisers apply a hybrid method. For a deeper treatment of these issues see Hoesli 1999.

able properties². The lack of information on house prices is particularly relevant in Italy, where households' preference for housing wealth is very high, due also to the market orientation of Italian households for owner-occupation. Furthermore, markets solve only a tiny corner of the overall problem of valuation, even for goods that are regularly and efficiently brought and sold (Epstein 2003). As there are so many variables that could be considered statistically significant price predictors (Kummerow & Watkins, 2003) and so different market participants who may be affected significantly by a wide range of intrinsic and external factors, the price has become very difficult to predict (De Lisle 1985). In order to increase the reliability of market-value, it's crucial to understand what kind of factors affects specific real estate markets and how much they influence prices.

In this context, the use of evaluation methods based on hypothetical markets, most widely used in the field of the evaluation of environmental goods or cultural heritage, could solve that problem. It has been found (Mattia *et al.* 2003) that estimating the willing to pay (WTP) for a sample of goods with different features brings to reliable outcomes with negligible gaps by comparison with the values obtained by the more traditional real estate appraisal methods.

According to these general assumptions, the paper suggests the use of stated preference methods with the aim of replace in the appraisal models the market prices (historical data) of a sample of properties with the willing to pay for the same goods.

2. The Contingent Valuation Method: theoretical background

With reference to the meaning of Total Economic Value, Stated preference (SP) techniques can estimate both use and non-use values, whereas revealed preference (RP) techniques can estimate only use values. The former rely on asking people hypothetical questions, looking how they respond to a range of choices, the latter are based on people's behavior in the face of real choices. More in detail, all SP techniques create an hypothetical market for the good being valued by a survey that describes the good, the reasons of payment and the payment vehicle: Contingent valuation method (CVM) ask respondents the amount they are willing to pay for the good being valued, while other types of stated preference analysis, like Choice Modeling approach (choice experiments, contingent ranking, paired comparisons and contingent rating), also use a hypothetical market, but they ask

² The sales comparison approach estimates value by comparing the subject property to similar ones being sold recently. Given the heterogeneity of properties, adjustments concerning physical characters, location, lease contracts, quality of tenants and market conditions are introduced in order to consider the differences between the subject property and the comparables. More adequate are prices of comparable properties, more reliable can be considered the outcome of the valuation process. Sales comparison approach can lead to mis-pricing as price of a specific property at a point in time is a random variable reflecting the heterogeneity, uncertainty and limited information of buyers and sellers.

respondents for rankings, ratings or choosing among alternative scenarios defined by a set of several attributes including price, rather than for values (Louviere, Henscher & Swait 2000). The most important difference between the CVM and the Choice Modelling approach is that the former is more suitable to evaluate a good as whole, while the latter is more likely to be required when the interest is on preferences for the individual characters of good being valued³. This represents the reason why this research suggests the use of CVM.

The application of CVM involves the following six different phases: 1) Preparation; 2) Survey; 3) Calculation; 4) Estimation; 5) Aggregation; 6) Appraisal. The goals of the first stage are: a) defining the initial items of the research as what is the object being valued; b) settling the hypothetical market according to two different measures of consumers' surplus: the willing-to-pay (WTP) for a welfare gain and the willing-to-accept (WTA) in compensation for a welfare loss; c) choosing target population – avoiding bias that can negatively affect the validity of the evaluation – and the size sample according to the cost and the precision of estimate; d) selecting the elicitation method among Iterative bidding game, Open ended, Close ended-Dichotomous Choice (single/double bounded)⁴; e) providing information about the good⁵; f) identifying the payment vehicle; g) testing and eventually redesign the questionnaire. During the survey phase valuers obtain responses to the questionnaire by interviews made face to face, by mail/telephone or by a mix format to users and non users. In the third stage are calculated the mean WTP (or WTA) from responses. In order to understand the determinants of WTP bids, in stage 4 a bid curve can be estimated⁶. In stage 5 the total value is obtained from mean WTP according to the targeted population. In the last phase the technical, institutional and financial acceptability of the values estimated by CVM is well considered (Hanley 1990; Bateman & Turner 1992).

Nevertheless CVM has been applied to a wide range of problems by federal and state agencies, governments and international organizations, it is the subject of great controversy, causing users of this technique to pay great attention to pref-

³ The choice about which technique is the more appropriate must be carefully carried out by experts. Nevertheless it's possible to use both of them with the aim to verify the sensitivity and consistency of results.

⁴ These are considered the most widely used elicitation methods. The Iterative bidding game submit to respondents different rounds of discrete choice questions or bids, with a final open-ended WTP question. In a Open ended approach respondents are asked "how much are you willing to pay?". Thus, the result is a continuous bid variable that may therefore be analyzed using ordinary least squares approaches (OLS). It's possible to use the Open ended method through a payment card that helps respondents in stating their own WTP. The Close ended - Dichotomous Choice ask respondents "are you willing to pay X". The amount of money is systematically stepped across the sample to test individuals' responses to different bid levels. The result is a discrete bid variable, that requires logit-type analysis.

⁵ The quantity/quality change in its provision, who will pay for it, who will use it.

⁶ For a continuous question format linear least squares estimation techniques are typically used. With a dichotomous payment format a logit or a probit approach is required, which relates the probability of a yes answer to each suggested sum to the explanatory variables.

erence elicitation and to reliability of the method. Most of the criticisms concern: i) the inconsistency of the answers given by respondents with the principle of rational choice, the so called embedding issue; ii) the difficulty of respondents of clearly understanding what they are being asked to evaluate because of the lack of adequate information about the good being valued; iii) respondents don't answer to the questions seriously because of the hypothetical character of the method; iv) responses to CV surveys sometimes seem implausibly large in view of the many programs for which individuals might be asked to contribute; v) relatively few previous applications of the CV method have reminded respondents of the budget constraints under which all must operate; vi) it's difficult sometimes to determine the extent of the market; vii) answers are affected by the "warm glow" effect (Arrow et al. 1993). Nevertheless these criticisms are widely acknowledged also by the proponents of CVM, they believe that future CV studies will solve all the objections. According to this call, the following application of CVM is aimed to contribute to increase its scientific acceptability.

3. A literature review on the use of CVM in real estate appraisal processes

In addition to the use of CVM in the field of the evaluation of non-market goods⁷, in the late 1990s its use for the appraisal of real estate has been suggested: few published studies concern the use of CVM for predicting specific real estate impacts in the context of litigation to determine the impact of contamination on property values⁸. Despite the effort expended to make the hypothetical choice as real as possible in order to get the maximum reliability of responses (Cummings *et al.* 1995), relevant researches have been carried out concerning that criticism. Thus, CV approach is not fully accepted, as some studies show that it doesn't produce acceptable estimates.

Starting from a market-based reliability test of the results of the application of CV technique for damaged properties, Roddewig & Frey (2006) argue that CVM cannot be considered an appropriate approach to value of real estate unless in situations involving special-purpose or limited-market properties for which there are few real sales transactions that can be analyzed. From their point of view, the inac-

⁷ The CVM was firstly used in the early 1960's by Davis (1963) who estimated by questionnaires the benefits of outdoor recreation in a Maine backwoods area. Starting from this research experience, Ridker (1967) used the CVM many times in order to estimate air pollution effects. In the next years other economists used the CVM to value several recreational amenities (Randall et al. 1974). Since the early 1970's the CV technique has been used by economists to measure the benefits of a wide variety of goods, including recreation, hunting, water quality, decreased mortality risk from a nuclear power plant accident and toxic waste dumps. Funding from the US Environmental Protection Agency (EPA) was crucial for CVM's development.

⁸ See Gary et al. 1990; Chalmer & Roher 1993; Mundy & McLean 1998; Jenkins-Smith *et al.* 2002; Simons 2002; Berrens *et al.* 2003; Simons & Kimberly Winson-Geideman 2005; Simons & Throupe 2005.

curacy of the real estate values' prediction based on hypothetical surveys depends on several reasons: the CVM questionnaire provides less information about the good than the ones generally available in an real market; the opinions of sellers and buyers are affected by the intermediaries; the survey format doesn't include those factors generally affecting real estate purchase and sale decisions as urban context's characters; survey consider only one side of transaction, either buyer or seller; CVM disregards that the price is the result of a negotiation process between two subjects, buyers and sellers, who often agree on a level of price that is a compromise as to their initial positions.

In a similar way Wilson (2006) analysing the recommendations published by the blue-ribbon panel of National Oceanic and Atmospheric Administration (NOAA) in the context of real estate valuation, concludes there is no substitute for an in-depth analysis of real sales information, since there is a big difference between an opinion expressed under hypothetical conditions and real transactions. Thus, he shows that applying CVM to real estate market means so many violations of the NOAA guidelines as to make it unreliable.

Mathews (2008), on the basis of a close inspection of specific CV questions and analysis techniques for better understanding why CVM fail to generate reliable estimates of property value losses associated with environmental disamenities, recognizes the practical impossibility for a property value CV survey to involve dynamic market conditions and all the information that real buyers and sellers generally consider.

As the disparity between stated and actual WTP remains a problem still open (Cummings *et al*, 1995), has been tested the use of CVM in order to estimate the willingness to pay for a sample of residential properties in the city of Milano, then compared to market prices⁹, with the aim of getting to an external validation of CVM.

4. The use of CVM for private goods: an experiment in the city of Milan (Italy)

As afterwards described Contingent Valuation Method has been used in order to estimate the market value of a sample of residential properties in the city of Milano. More in depth, four apartments have been considered, whose size is 55 sqm (Maroncelli), 67 sqm (Gobetti), 65 sqm (Bassi), 35 sqm (Cambiasi). As the first two has been sold, their market price is well known.

The sample has been chosen from potential purchasers, found both by advertisements on real estate magazines and by a real estate agency in charge of selling two of the apartments. Each individual of the sample knows the apartments by a direct visit or by a card including both a detailed description of the dwellings, of the building and of the urban context and pictures of outside and inside of the apartments. The face to face interviews has been carried out after the potential purchasers' knowledge of the good being valued in order to ensure that respon-

⁹ See Dickie, Fisher & Gerking 1987; Cummings & Harrison 1995; Bishop & Heberlein 1979.

dents understand the scenario and are encouraged to participate in an informed manner.

As a careful questionnaire design is essential for the validity of the outcomes, its comprehensibility has been tested before administration. The questionnaire used in this case study involves four questions. The first ask respondents if the apartment meet their needs. According to these answers, the sample has been divided in two sub-samples: the sub-sample A, including those are really interested in the apartment; the sub-sample B, including instead those not considering the good suitable to their needs (see table 1). This division of the sample in two sub-sample is required by the different meaning of WTP information in each of them. Furthermore, it makes possible to verify potential strategic behaviors in WTP eliciting by those are going to start a real transaction aimed to the purchase.

Table 1. Size of two sub-sample.

	Size of the sample	
	Sub-sample A	Sub-sample B
Bassi	65	64
Cambiasi	50	79
Gobetti	65	65
Maroncelli	67	62

For each sub-sample are collected the main information that could interest (or not) the potential purchaser: location, degree of site's quality, position, features of the building, floor, entrance, size, distribution, maintenance's conditions of dwelling, dinette kitchen, balconies, terraces, number of bathrooms, car park, attic, cellar, quality of equipments and of internal finishing (see table 2).

For the sub-sample A the elicitation question has been formulated according to the Close Ended- Dichotomous Choice approach, because it avoids bias more than the other formats. As a matter of fact, it has been verified that Dichotomous Choice (DC) method leads to accurate estimates of true WTP, because it yields incentive-compatible results (Cummings, 2005). The amount of money suggested randomly to respondents has been obtained by increase or decrease – according to five fixed ranges – of the most probable market value of the four dwellings, estimated by the sale comparison approach.

Once the measure of respondents' WTP has been fixed, they are asked to elicit it. The specific purpose of the valuation, the clearness and the credibility of the scenario may facilitate respondents' thought processes. Furthermore, the Close-ended Dichotomous Choice approach reduces strategic bias and encourages respondents to consider their preferences carefully. The WTP elicitation is also affected by the information about properties' market prices. Concerning this, it is crucial to point out that the meaning of no-answers is not immediately clear: it

could be considered both a real unwillingness to pay the amount of money suggested and the first trial of negotiation on sale price.

On the contrary, those answering to the first question that they the dwelling being valued doesn't meet their own needs are faced to the sale price, chosen, as for the sub-sample A, among five fixed ranges. Whereas, the price is not accepted, respondents are asked to elicit the value according to an open-ended approach.

The last part of the questionnaire focuses on the socio-economic characteristics.

Table 2. Main positive (sub-sample A) and negative (sub-sample B) features.

	BASS_A	BASS_B	CAMB_A	CAMB_B	GOB_A	GOB_B	MAR_A	MAR_B
Location	24,6	32,2	27,3	19,8	28,6	24,1	37,8	24,2
Site's quality	25,7	7	31,4	6,8	28,5	8,3	20,5	10,7
Position	33,3	8,3	12,7	23,2	22,0	26,1	52,2	13,4
Typology of building	32,3	0,67	22,3	3,6	10,3	8,3	12,7	16,6
Floor	9,2	35,9	62,0	2,5	13,8	23,1	19,4	19,3
Entrance	0,8	3,1	4,0	10,1	1,5	26,1	11,9	21
Size	75,4	64	68,0	95	69,2	69,2	61,2	61,3
State of maintenance	6,1	4,7	21,5	3,8	38,4	18,5	82,1	14,5
Internal distribution	18,44	9,1	14,4	4,4	7,7	14,3	28,3	3,75
Dinette kitchen	47,7	34,4	14,0	30,4	4,6	9,2	0	32,2
Double bathrooms	0	6,2	0	2,5	0	4,6	0	0
Balconies	60		0	30,4	0	27,7	0	9,7
Terraces	0	3,1	0	0	0	3,1	0	0
Finishing	27,7	15,6	6	12,6	4,6	36,9	68,6	0
Electrical equipment	1,5	3,1	0	6,3	0	6,1	29,8	0
Heating	7,7	15,7	10	18,9	15,4	12,3	44,8	0
Car park/garage	10,8	12,4	0	12,7	0	10,7	0	14,4
Attic/cellar	20	1,6	0	7,6	0	9,2	0	11,3

5. Critical analysis of the results and conclusions

The data collected by the survey are summarized in this step of analysis. As each respondent has stated whether their maximum WTP is above or below a

given amount, according to a single-bounded discrete choice elicitation model, the type of data is binary. In the close ended approach the statistical analysis has a crucial role: the WTP value is inferred by the trend of discrete choice variation (yes/no) with reference to the bids. The evaluator, according to an increasing sequence of bids, show to each respondent one amount of money randomly chosen. The answer (yes/no) is not the maximum WTP of respondent, but its discrete measure. The demand curve is after obtained on the basis of principles of inferential statistics. In order to estimate a binary dependent on the basis of different independent variables, the approach to be followed is probabilistic: Logit or Probit¹⁰. The measure of change in utility is given by the probability function of the event (cumulate density distribution function), that is the probability distribution of dichotomous variable yes/no (1/0), which represent the sample's answer to the bid.

In this case study the analysis of answers about WTP has been carried out by the Logistic regression model, assuming the Logit model, based on random utility theory, as function of $F\eta(\Delta V)$.

$$F\eta(\Delta V) = [1 + \exp(-\Delta V)]^{-1} \quad (1)$$

This model, which directly estimate the probability of an event, is grounded on the following hypothesis¹¹:

the choice (yes/no) is carried out by a rational individual according to an utility function. He chooses what can maximize its utility;

the utility function include both a deterministic and a stochastic component;

random terms have the same probability distribution for all decision-makers and for all the options and are independent.

The binary data has been calculated by the maximum likelihood ratio estimation. Two different paradigms of change in utility (ΔV) have been followed, the first is consistent with economic theory; the second, despite it's not directly obtained by a difference between utility functions, could be considered a proxy of ΔV (Hanemann, 1984):

$$\Delta V = \alpha - \beta X \quad (2)$$

$$\Delta V = \alpha - \beta \ln(X) \quad (3)$$

where X is the amount of money faced to respondents.

¹⁰ The probability functions of these models are, respectively, the normal standard distribution and the logistic standard distribution, that are bounded in a 0-1 range, since they are functions of distribution. The Logit model is simpler to apply than the Probit one. It is also grounded on microeconomic behavior principles.

¹¹ Since decisions are taken in a context of limited rationality and uncertainty, these hypothesis could be considered also the limits of the Logit model.

The followings tables (3-6) show the relationships between bids and WTP for each sub-sample.

Tables 3-6. Relationships between bids and WTP for each sub-sample.

BASSI				
BID	Sample A WTP		Sample B Do You Think "X" is the right price?	
	% YES	%NO	% YES	%NO
180	29,41	0,00	56,00	7,69
195	26,47	12,90	20,00	12,82
210	38,24	16,13	20,00	10,26
225	2,94	38,71	4,00	35,90
240	2,94	32,26	0,00	33,33
TOTAL	100	100	100	100

GOBETTI				
BID	Sample A WTP		Sample B Do You Think "X" is the right price?	
	% YES	%NO	% YES	%NO
160	36,84	0,00	22,45	0,00
175	23,68	3,70	32,65	0,00
190	23,68	3,70	26,53	13,33
205	5,26	37,04	18,37	26,67
220	10,53	55,56	0,00	60,00
TOTAL	100	100	100	100

CAMBIASI				
BID	Sample A WTP		Sample B Do You Think "X" is the right price?	
	% YES	%NO	% YES	%NO
65	31,82	0,00	34,04	3,13
75	45,45	3,57	29,79	3,13
85	13,64	25,00	25,53	15,63
95	9,09	42,86	8,51	18,75
105	0,00	28,57	2,13	59,38
TOTAL	100	100	100	100

MARONCELLI				
BID	Sample A WTP		Sample B Do You Think "X" is the right price?	
	% YES	%NO	% YES	%NO
180	100,00	0,00	85,70	14,30
200	50,00	50,00	92,90	7,10
220	29,00	70,60	50,00	50,00
240	0,00	100,00	0,00	100,00
260	0,00	100,00	6,70	93,30
TOTAL	32.80	67.20	50,00	50,00

On the basis of logistic regressions' outcomes, the median¹² value of WTP has been calculated¹³.

¹² Median WTP is considered the more robust measure of central tendency since its value is not so influenced by outliers.

¹³ That is the value of X that makes $P(\text{yes})=P(\text{no})=0,5$. In the logit model, where F is the standard logistic cumulate frequency distribution, $F(0)=0,5$. When $\Delta V(x)=0,5$, the median values of function are obtained.

Table 7. Median values of WTP for each sub-sample according to two different utility models.

model	$\Delta V = \alpha - \beta X$ $\Delta V = \alpha - \beta \ln X$		Open Ended	Market Value				Market Price
	med1A	med1B	med2A	med2B	medB			
BASSI	213.635	200.829	211.853	198.989	180.000	210.000		N.C.
CAMBIASI	81.945	91.793	83.734	89.501	75.000	85.000		N.C.
GOBETTI	201.255	200.290	200.410	206.129	175.000	190.000		208.000
MARONC.	204.206	216.783	204.624	216.838	185.000	220.000		210.000

The table 7 points out that there are negligible gaps between the WTP values and the market values estimated by the more traditional real estate appraisal methods.

Even if the two main features of this method – the hypothetical character of the questions and the fact that the actual behaviour is not observed but only predicted – has been broadly criticized (Adamowicz *et al.* 1994), in this study the WTP can be considered the behaviour of the potential buyers in the face of real choices. Many of the potential problems associated with CVM have been overcome, since strategic bias has been reduced by pre-testing the valuation questionnaire and using different bidding mechanism according to two different groups of buyers selected, the one who answer that the property meets its needs and the second who is not really interested in it.

To this end, it's meaningful to specify that the possible strategic character of the answers to the questionnaires given by individual interview is consistent with the real estate prices' formation process.

Despite the so-called hypothetical bias has been well studied both in laboratory and field settings¹⁴, it's widely known that a great part of the reliability of hypothetical surveys depends on how interviewed understand the scenario proposed ensuring that their answers are consistent with the objective of the survey. In this experiments the hypothetical bias is minimized since: i) respondents are selected among potential buyers; ii) they are faced to a scenario deeply drawn; iii) the sub-sample of respondents really interested in the property being valued visited the apartments; iv) the elicitation process used is familiar and puts respondent in a real market frame of mind, because it's very close to a real negotiation between parties¹⁵.

¹⁴ Different studies suggest that mean hypothetical values are about 2.5 to 3 times greater than actual cash payments. The causes underlying this bias are not still well understood. Possible reasons for hypothetical bias include: lack of consequence associated with individuals' responses; desire to increase the likelihood that the good is provided at little or no personal cost; respondents uncertainty or ambivalence. Since the hypothetical bias is associated with private as well as public goods, its underlying causes may be quite complex (Stevens 2005).

¹⁵ It has been also reduced the strong influences that unfamiliar situations have on respondents. In most of the surveys these influences are not identified by researchers (Wilson 2006).

Furthermore, according to the validity and reliability tests of the contingent valuation predictions suggested by Roddewig and Frey (2006)¹⁶, for two of the four properties the values estimated in this research has been compared to the real market-price, showing shorter differences between the values estimated by CVM-Dichotomous Choice (average of values estimated according to different utility models for the two subsamples: 2,87% for Gobetti apartment and 2,95% for Maroncelli apartment) than the ones estimated by CVM- Open ended (only for sample B: 15,87% for Gobetti apartment and 11,90% for Maroncelli apartment).

On the basis of these results it's possible to consider this experiment a progress toward the challenge of reducing the match between intended and actual behavior in order to increase the acceptability of CVM studies.

Finally, the research could be developed with the aim of setting up an evaluation procedure for the systematic production of median willing to pay for properties. On the one hand, these data could be useful for the auditing of banks or lending institutions on fairness of values and prices used by developers to have credit.

Providing such exhaustive information is crucial in the urban development processes, where developers are called to carry out market analysis and marketability studies¹⁷ in order to understand the feasibility of their proposals. More in detail, the market studies are generally carried out for two purposes: due diligence and political reasons. Both in these cases, talking with people in order to understand their needs is more important than the quantitative data associated with the traditional market research. Marketability studies are aimed to measure the demand for real estate projects and to prove the idea of going on with a project. According to these main goals, market and marketability studies should be considered important for the success of a real estate developing initiative, because by asking to the target market to consider its needs and wants they stimulate and manage demand (Peca, 2009). Under these perspective, by a CVM studies developers could understand if there will be tenants and buyers for the proposed project and at what rent or price will absorbed into the market, collecting essential information about the opportunity to pursue a project.

¹⁶ The two authors suggest the following methods in order to test the validity and reliability of the contingent valuation predictions: i) comparison of the prices actually paid in an entire, "fully informed" marketplace to the prices predicted for that marketplace by contingent valuation surveys done before the market became fully informed; ii) comparison of the prices actually set or paid for individual properties by fully informed survey participants; iii) comparison of the prices actually set or paid by other sellers or buyers who can be determined to have possessed the same (or more) information at the date of sale or purchase as the survey participants and therefore to have been as fully informed as survey participants (Roddewig & Frey 2006).

¹⁷ The market analysis is the first step of a market research. It is a quantitative analysis as it requires to evaluate demand, supply, tenant mix, absorption and lease rates for a specific project. The marketability study is the second step and it's very important because it rationalizes the aspects of a specific project with the need of a targeted market (Peca 2009).

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