

CONSIGLIO NAZIONALE GEOMETRI



The System of Real Estate Quality Appraisal

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ITALIA



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Qualitative Characteristics

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The Appraisal System

$$\begin{cases} V + \sum_{i=1}^n (x_{1i} - x_{0i}) \cdot p_i = P_1 \\ V + \sum_{i=1}^n (x_{2i} - x_{0i}) \cdot p_i = P_2 \\ \dots = \dots \\ V + \sum_{i=1}^n (x_{mi} - x_{0i}) \cdot p_i = P_m \end{cases}$$

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Vectors and matrix

$$D = \begin{bmatrix} 1 & x_{11} - x_{01} & x_{12} - x_{02} & \dots & x_{1n} - x_{0n} \\ 1 & x_{21} - x_{01} & x_{22} - x_{02} & \dots & x_{2n} - x_{0n} \\ \dots & \dots & \dots & \dots & \dots \\ 1 & x_{m1} - x_{01} & x_{m2} - x_{02} & \dots & x_{mn} - x_{0n} \end{bmatrix}$$

$$s = \begin{bmatrix} V \\ p_1 \\ p_2 \\ \dots \\ p_n \end{bmatrix} \quad p = \begin{bmatrix} P_1 \\ P_2 \\ \dots \\ P_m \end{bmatrix}$$

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The System Appraisal in terms of matrix

$$\begin{bmatrix} 1 & x_{11} - x_{01} & x_{12} - x_{02} & \dots & x_{1n} - x_{0n} \\ 1 & x_{21} - x_{01} & x_{22} - x_{02} & \dots & x_{2n} - x_{0n} \\ \dots & \dots & \dots & \dots & \dots \\ 1 & x_{m1} - x_{01} & x_{m2} - x_{02} & \dots & x_{mn} - x_{0n} \end{bmatrix} \begin{bmatrix} V \\ p_1 \\ p_2 \\ \dots \\ p_n \end{bmatrix} = \begin{bmatrix} P_1 \\ P_2 \\ \dots \\ P_m \end{bmatrix}$$

$$D \cdot s = p$$

the solution looks like this:

$$s = D^{-1} \cdot p \rightarrow \text{the matrix coefficients are non-singular}$$

$$s = (D^t \cdot D)^{-1} \cdot D^t \cdot p \rightarrow \text{the Moore-Penrose generalized inverse}$$

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The System Appraisal and the Market Approach

Sales adjustment grid

Price and characteristics	A	B	C	...
Price				
Characteristics aestimabiliis				
Correct price				

Value and marginal prices = characteristics inaeestimabiliis = correct price

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..thanks you for your attention !

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