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The Valuation of Hope Value Using Real Option Theory

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Hope value refers to potential increase in value achieved through investing in improving the aspect of a property e.g. completing development of partially completed office building. (ECB, Asset Quality Review , Manual II Phase, p.147)

"…Any element of open market value of a property in excess of the current use value, reflecting the prospect of some more valuable future use or development. It takes account of the uncertain nature or extent of such prospects, including the time which would elapse before one could expect planning permission to be obtained or any relevant constraints overcome, so as to enable the more valuable use to be implemented…."(RICS Appendix F Glossary Terms, p.43)

Hope value…will reflect an appraisal of the probability that the market places on that higher value use or development being achieved, the costs likely to be incurred in doing so, the time scale and any other associated factors in bringing it about. Fundamentally, it will allow for the possibility that the envisaged use may not be achieved. While descriptive of that uplift, it does not exist as a separate value but helps explain the market value of the property which must be judged from the available evidence just as much as any other part of the valuation. Hope value is not a special value as it represents the market place's reasonable expectations as to the opportunities offered by the property. (European Valuation Standards 1 (EVS,2012) describes hope value at the point 5.4.4)

REFURBISHMENT

The concept is often analysed in relation to greenfield land whose landowner is hoping that the land will present a difference between the value in existing use as agricultural destination and whatever price the purchaser actually pays for the land. It may be referred also to a building that may be refurbished in this case can be considered as the difference between the value in existing use and the value that the market may pay for the future transformation.

PLANNING CHANGE

Hope value is therefore the difference between existing use value and the price that the market might pay for the land with the hope of planning consent for a more valuable use.

Since the 2011 IVS provides the following definition of income approach: *Methods that fall under the income approach include: Income capitalisation, where an all-risks or overall capitalisation rate is applied to a representative single period income; Discounted cash flow where a discount rate is applied to a series of cash flows for future periods to discount them to a present value; Various option pricing models (IVS 2013, Framework, para 60).*

As one can see Real Option is a Theory included in professional valuation practice since 2011

Literature review demonstrates several applications of Real Option Theory to the Real Estate (Womack ,2015)

It has been stressed that *"…the valuation of development land is one of the most challenging tasks confronting the valuation today…"*(Adair et al.,2005;p.).

Among the other contributions it is possible to quote Brennan and Schwartz (1985) proposed the real options as a tool for real investment decisions, a model for the valuation of vacant land (Titman, 1985), linkage between real estate and petroleum price (Paddock et al.,1988), real estate finance (Kutner and Seifert, 1989), lease contract contingencies (Buetow and Albert, 1998), A binomial option model was applied to define the optimal point to transform agricultural land in a building plot (Capozza and Sick, 1989); Williams (Williams,1991) provides an application of binomial stochastic modelling to determine the optimal condition of a real estate investment.

In his fundamental work Titman (Titman,1985) stressed that a "*...vacant lot can be viewed as an option to purchase one of a number of different possible buildings at exercise prices that are equal to their respective construction costs* (Titman,1985,p.505)...".

Therefore a development site can be seen as an option to build at some point in the future and owning the site means owning a call option with an infinite life. In general term the value a call option is the difference between the market value of building units Pt and the exercise price or the construction cost Kt. The value of the site may have a value because of the expected future profit of development (growth option).

$$\max(P_t - K_t; 0)$$

The two conditions for the determination of state prices in Titman's (Titman,1985) model are:

$$p_0 = s_h p_h + R_t s_h + s_l p_l + R_t s_l \qquad 1 = s_h (1 + R_f) + s_l (1 + R_f)$$

In the formula p_0 is the price per square meter p_h for the high states of nature while p_l is the price per square meters for the low state of nature Rt is the rent per square meter. Combining the equations the states price will be derived

$$s_h = \frac{p_0 - \left(p_l + \frac{R_t}{(1+R_f)}\right)}{p_h - p_l} \qquad s_l = \frac{\left(p_h + \frac{R_t}{(1+R_f)}\right) - p_o}{p_h - p_l}$$

The determination of state prices s_h and s_l will allow the appraiser to determine the value of the vacant land as in the formula below

$$V_1 = \Pi(p_h)s_h + \Pi(p_l)s_l$$

Considering that "Growth Expansion" and "Abandon" Options have the same pay-off

This is the value of the vacant at date 0 to be transformed at date 1

Using this model it is possible to introduce the hope value as a component of market value of a property that may be in excess of the current use value to reflect the prospect of some more valuable future use or development

For this issue 4 possible different hypothesis have been selected in order to determine Hope Value/Future Value

$$\Pi(p_0) \geq 0 \qquad \Pi(p_0) \geq \Pi(p_h)s_h + \Pi(p_l)s_l$$

$$\Pi(p_0) < \Pi(p_h)s_h + \Pi(p_l)s_l \qquad \Pi(p_h)s_h + \Pi(p_l)s_l > 0$$

Titman's work may be useful to model hope value. In fact, the presence or the absence of hope value and its quantification may be modelled as follows:

$$V_{HP} = \max\left[\left(\Pi(p_h)s_h + \Pi(p_l)s_l\right) - \Pi(p_0); 0\right]$$

22 asking price and 4 different real estate brokers agencies giving a forecast of future valuation about different lands in the surroundings of Rome according to planning modifications

Observations	Place	p_0	p_l	p_h
1	Colle del Sole	€ 433.854,17	€ 260.312,50	€ 347.083,33
2	Monte Migliore	€ 904.964,40	€ 737.378,40	€ 1.173.102,00
3	Monte Migliore	€ 1.032.750,00	€ 841.500,00	€ 1.338.750,00
4	Ottavia	€ 1.715.385,00	€ 1.432.200,00	€ 2.278.500,00
5	Ottavia	€ 756.245,00	€ 536.690,00	€ 853.825,00
6	Casale Lumbruoso	€ 690.200,00	€ 523.600,00	€ 856.800,00
7	Infernetto	€ 1.724.480,00	€ 1.562.810,00	€ 2.047.820,00
8	Infernetto	€ 1.555.840,00	€ 1.409.980,00	€ 1.847.560,00
9	Infernetto	€ 579.360,00	€ 525.045,00	€ 687.990,00
10	Trigoria	€ 318.750,00	€ 242.250,00	€ 382.500,00
11	Trigoria	€ 461.125,00	€ 350.455,00	€ 553.350,00
12	Trigoria	€ 371.875,00	€ 282.625,00	€ 446.250,00
13	Morena	€ 734.400,00	€ 344.250,00	€ 459.000,00
14	Morena	€ 538.560,00	€ 252.450,00	€ 336.600,00
15	Val Cannuta	€ 1.487.500,00	€ 1.275.000,00	€ 1.657.500,00
16	Boccea Vallesanta	€ 317.900,00	€ 289.000,00	€ 404.600,00
17	Casal Palocco	€ 1.071.000,00	€ 910.350,00	€ 1.338.750,00
18	Casal Palocco	€ 433.500,00	€ 368.475,00	€ 541.875,00
19	Casal Palocco	€ 413.100,00	€ 351.135,00	€ 516.375,00
20	Borghesiana	€ 510.000,00	€ 340.000,00	€ 425.000,00
21	Borghesiana	€ 382.500,00	€ 255.000,00	€ 318.750,00
22	Castel Fusano	€ 394.400,00	€ 272.000,00	€ 435.200,00

	V_1	V_0	V_H
1			
2	€ 517.945,1762	€ 510.644,40	€ 7.300,78
3	€ 591.081,6832	€ 582.750,00	€ 8.331,68
4	€ 1.078.565,1980	€ 1.064.385,00	€ 14.180,20
5	€ 474.558,7624	€ 469.245,00	€ 5.313,76
6	€ 415.384,1584	€ 410.200,00	€ 5.184,16
7	€ 1.105.953,3663	€ 1.090.480,00	€ 15.473,37
8	€ 997.800,1980	€ 983.840,00	€ 13.960,20
9	€ 371.558,4653	€ 366.360,00	€ 5.198,47
10	€ 171.148,5149	€ 168.750,00	€ 2.398,51
11	€ 247.594,8515	€ 244.125,00	€ 3.469,85
12	€ 225.923,2673	€ 223.125,00	€ 2.798,27
13			
14			
15	€ 1.000.123,7624	€ 987.500,00	€ 12.623,76
16	€ 150.761,3861	€ 147.900,00	€ 2.861,39
17	€ 450.013,3663	€ 441.000,00	€ 9.013,37
18	€ 182.148,2673	€ 178.500,00	€ 3.648,27
19	€ 173.576,5842	€ 170.100,00	€ 3.476,58
20			
21			
22	€ 237.093,0693	€ 234.400,00	€ 2.693,07

The difference indicated in the formula 19 will occur only if it is verified the condition exposed in the algorithm. Therefore a hope value it will be possible only if that condition will be satisfied and the final results will be the difference between the two (in this case) state prices.

$$V_H = V_1 - V_0$$

It has been proposed a method to determine hope value

The method is based on the original Titman's model (Titman,1985) with a simple modification (eliminating Rt)

The existence of hope value is based on the algorythm based on the difference between the future value and the actual value of the property

This difference become a valuation method rooted in the real option theory framework that has been introduced in the International Valuation Standards since the 2011

The application of the method is essentially refereed to refurbishment and change in the planning process

Those who live out of the Truth, can not be defined happy. Happiness, therefore, is based on the capability to express a secure, stable and immutable judgement (Lucio Anneo Seneca, De Vita Beata)

...beatus enim dici potest extra veritatem proiectus. Beata ergo vita est in recto certoque iudicio stabilita et immutabilis (Lucio Anneo Seneca, De Vita Beata)