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**XXV UPAV VALUATION CONGRESS
ASSOCIATIONS VALUATION PANAMERICAN UNION
Miami, Fl. - EUA - 02 a 04 NOV 2010**



SUBTOPIC

« SOLUTIONS IN DISTRESSED MARKETS »

Urban Site Valuation in Depressed Markets

« THE REAL ESTATE INVESTMENT INDIFFERENCE APPROACH® - THE E3I® »

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Summary

This paper deals with a real estate valuation approach in the context of the International Valuation Standards (IVS), in harmony with the International Financial Reporting Standards (IFRS), the International accounting Standards (IAS) and the International Public Sector Accounting Standards (IPSAS). Without the complexities, time and cost associated with the «Highest and Best Use» criterion leads to value results good enough. It is particularly useful for valuing vacant site in any urban area; also to establish values benchmarking to validate estimated values by other criteria. It has special relevance when, in open economies, there are not sufficient data to apply criteria for comparison of prices or other conventional methods because of the lack of sales, supply and demand, such as it happens in stagnant or depressed market; or because the site to be appraised have some special or unique use. The approach is based on the site evaluation considering the equilibrium in the net income brought out by a set of different real estate investments whether in the same market or not.

Key words: * Indifference in Real Estate Investment * land value equilibrium * site valuation * depressed real estate market

Resumen

Se trata de un **enfoque de valoración inmobiliaria** en el contexto de las Normas Internacionales de Valuación, armonizadas con las financieras y contables internacionalmente vigentes. Sin las complejidades, tiempos y costos que conlleva la aplicación del criterio «mayor y mejor uso». Es particularmente útil para valorar suelos vacantes en cualquier ámbito urbano, a la par de ayudar al establecimiento de *values benchmarking* para convalidar valores estimados por cualesquiera otros métodos. Tiene especial relevancia cuando, en economías abiertas, no existen suficientes datos para aplicar criterios de comparación de precios u otros convencionales como sucede en mercados estancados o deprimidos; o bien porque se trata de suelos con usos muy particulares o únicos en la zona donde se encuentran. El enfoque se funda en la evaluación del suelo considerando el equilibrio en la utilidad dineraria neta que conllevaría su potencial edificación en el conjunto de los viables en el mercado inmobiliario. De allí su nombre: El **Enfoque de la Indiferencia en la Inversión Inmobiliaria**® -El **E3I**®, el cual cobra mayor importancia por permitir, a diferencia de métodos tradicionales, la convalidación directa, expedita y razonadamente sólida de resultados valorativos, requisito básico en las valuaciones profesionales. En esta ponencia se presentan sus esencialidades y aplicación a un caso real; así como las conclusiones más significativas de su desarrollo y algunas acciones relevantes de proseguir. Al final se citan dos referencias primordiales y una breve reseña curricular del autor.

Palabras claves: * indiferencia en la utilidad inmobiliaria * equilibrio valorativo de la tierra * valoración del suelo * mercado inmobiliario deprimido

0. A starting thought

Each thing may have a value according to the benefit it brings out; when different things lead to the same unitary net income, they, as a set, might be equally attractive.

Hugo J. Guerra, 20-AUG-2010.

1. The situation

Valuing the site in free, open and global economies is complex and controversial, particularly in stagnant or depressed markets. Why?; for a variety of reasons:

a) The land is, essentially, a natural and scarce good, subject to the most varied considerations and preferences, both objective and subjective; and therefore, subject to constant philosophical, political, legal, economic, social and military disputes on its use, enjoyment and disposal.

b) The site value depends upon it is vacant or not. Once it is improved, its value might be higher or lower, depending on the synergy or dysfunctional of the site-improvement union.

c) The land is permanently threatened by externalities whose effects do not necessarily manifest themselves in only one-way, constant and predictable. The evaluative externalities's consequences on the same site, in some opportunities might lead to capital gains, but in other to capital loss.

d) Valuation standards requires valuing the site, vacant or not, according to the «highest and best use (HBU)». This criterion compels to assess, sequentially, the physical feasibility of the land use, the legal conditions of such a use, the range of economic use possibilities and, within them, the most profitability one. The application of the **HBU** has important limitations since it demands information, hypothetical assumptions about possible future events, effort, time and appraiser competence which are not always feasible to achieve with due diligence, relevance, economy and acceptance from whom asks for the assessment. Moreover, in some jurisdictional environments the application of such a criterion, like other based on assumptions about

future events, might be of dubious acceptability because of being "*based on hypothetical considerations*".¹ In any case, the results that be gotten from the **HBU** would have to be reconciled and validated with values deducted from alternative criteria, which might be simpler, cheaper and quicker and not necessarily with bigger estimates' error margin.

e) The **HBU** analysis can be a difficult and costly evaluative work in cases where the land use is not formally defined, being it depending on *ad hoc* development projects, as it happens where there the land is subject to special Zoning Regulations.

f) For the site valuation, besides the **HBU** criterion, there are others applicable with more or less relevance, which not necessarily lead to similar estimates and, thus, complicating the appraisal because the different possible results. Among them, the following can be named:

- ✓ *Price comparison*
- ✓ *Development analysis*
- ✓ *Allocation*
- ✓ *Extraction*
- ✓ *Ground rent capitalization*
- ✓ *Ground contribution to the rent capitalization*
- ✓ *Subdivision Development*
- ✓ *Land value maps*
- ✓ *Analysis-synthesis*²
- ✓ *Real estate investment equilibrium*³
- ✓ *Traveling costs*
- ✓ *Hedonic method*
- ✓ *Contigent model*

¹ This is the case in Venezuela, for example.

² Developed by the author of this paper as "The Matrix Valuation Approach ©® - the EVM®-. Initial version: Guerra, H. J. (2008): Matrix Valuation Model. Juan José Aguerrevere Foundation. Colegio de Ingenieros de Venezuela. Caracas. Its updated is described in a monograph *ad hoc*.

³ Also developed by the author of this paper under two perspectives of the net income: 1) As a net utility: «The e Real Estate Investment Indifference Approach©® -The E3I®-» exposed in this paper; and, 2) According to the net return on investment: The Equilibrium of the Net Return Real Estate Investment Approach©® -The ERI®-, covered in a separated document.

g) Given the unique characteristics of each particular site as well as the indubitable variety of preferences and consequent multiplicity of values that might be considered by suppliers and demanders for the use, enjoyment and disposal of the land, it is not easy to widespread the application of the hypothetical provision upon which the **market value** in the **IVS** and the **fair value** in the **IFRS**, **IAS** and **IPSAS** are defined.⁴ It has to be said that not always the conditions for the existence of a **market value** according to the **2007 IVS** are present. According to these Standards, pp. 45 in the Spanish edition:

"The market value is the estimated amount for which an asset, on the date of valuation, could be exchanged between a willing buyer and a willing seller in an arm's length transaction after proper marketing, in which the parties acted prudently and without compulsion."

Quite often the facts demonstrate how that definition is so hypothetical, being necessary to be contextualized in specific situations for its actual implementation.

h) Beyond the above considerations it has to be noted that the site value is not an absolute concept since it is conditioned by the benefit of the investment made to improve it, either as an alternative or in conjunction with those carried out in other possible sites. From a valuation perspective, the utility is particularly important under the premise that the values of things are conditioned, *ceteris paribus*, by the profits that they may generate.

i) Another important criteria for the site valuation: the «direct price comparison» could bring some other complications because facts as the following:

✓ Not always there are similar sites to estimate value based on price comparisons, especially in not open economies, and in stagnant and/or depressed environments where there are insufficient offers and/or demand for vacant sites or possible ones to be rebuilt.

⁴ **IVS**: International Valuation Standards. **IFRS**: International Financial Report Standards. **IAS**: International Accounting Standards. **IPSAS**: International Public Sector Accounting Standards.
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✓ The property subject to valuation may have a public or private specific use so that makes it unfeasible to have reference prices; this is the case, i.e., of sites to be used for urban infrastructure public equipment: schools, electrical substations, hospital, gas stations, parks, etc..

In summary, the application of conventional valuation criteria to value urban site such as the «highest and best use», the «price comparison» and the «hypothetical improvement» present some important restrictions to be applied even in open economies. This forces to improve standard methodologies used for valuing that type of good, especially if the respective valuations should be disclosed according to international financial and accounting standards, as required in many local and national economies and, inevitably, in the global ones.

2. The problem to be solved in response to the described situation

To value urban sites, even without enough comparables to apply the «method of comparison of prices», surpassing the complications involved in the application of the «highest and best use» criterion, as well as the inherent subjectivity in the solution only based on the «hypothetical site development».

3. Objectives to achieve solving the problem

To develop a sufficiently effective and efficient method so that, with reasonable objectivity and productivity, it can be possible:

- ✓ To appraise vacant urban sites in markets that: a) may be local or global; b) have or not enough comparables; and, c) could be or not stagnant and/or depressed.
- ✓ To validate the urban sites estimated values formulated by conventional methods.
- ✓ To facilitate the valuation with **Bases other than Market Value**.⁵

⁵ Established in the **IVS 2, 2007**.
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4. Justification to address the problem: what for and why for?

To address the problem is necessary to improve the **IVS**, the **IFRS**, the **IAS** and the **IPSAS**; and, consequently, the valuation urban sites, in local, national, regional and global economies. Thus:

- ✓ To appraise the vacant site in a relatively expedited way, with acceptable levels of probability confidence, optimizing the labor productivity of the assessments, with significant savings in time and money to those who need and do the valuation professional work.
- ✓ Because, whatever the circumstances which deprive and characterize the real estate market of interest, it is necessary to have a universal acceptable valuation criterion to overcome difficulties such as those described in the findings pointed in Sec. 1 *ut supra*.

5. The reference framework

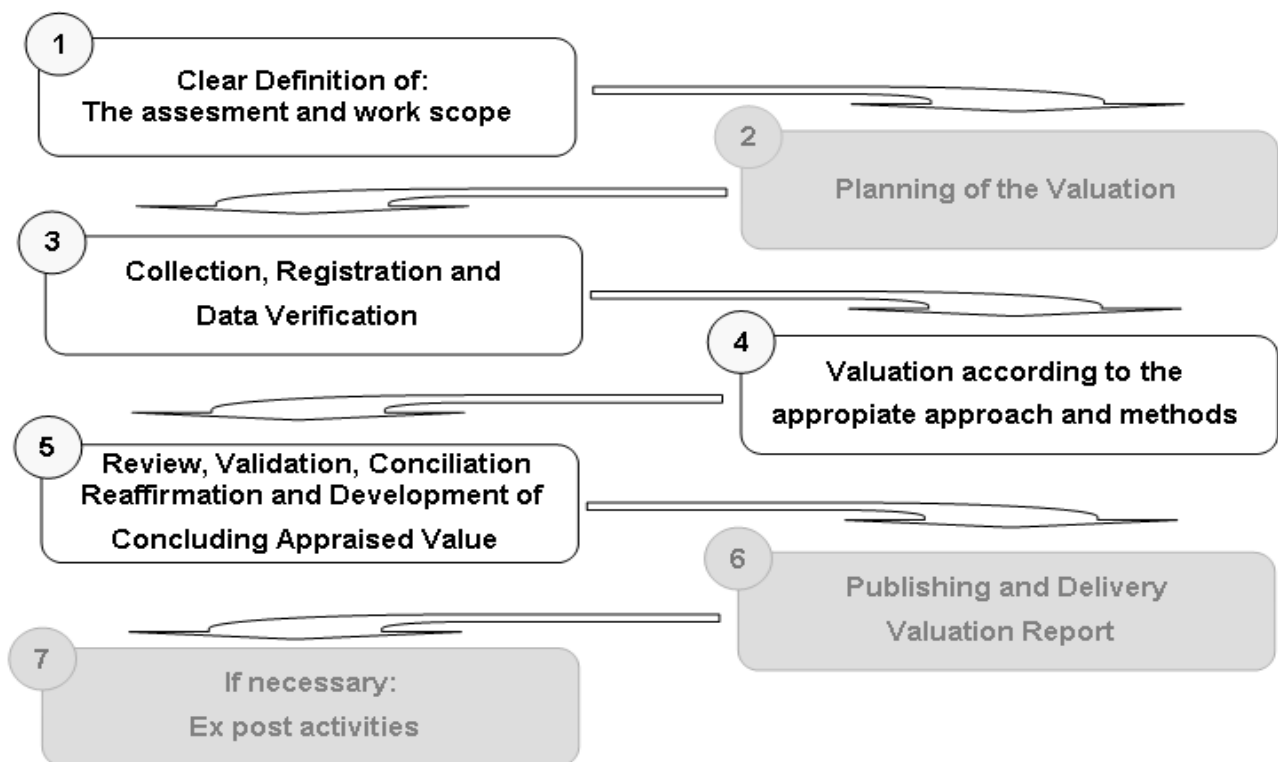
It is composed by the theories of value, valuation and appraisal; as well as the **IVS**, the **IFRS**, the **IAS** and the **IPSAS**. Those theories are important because: The **theory of value** tries to explain the causes that generate value; the **theory of valuation** by the need to explain the value metric; and the **appraisal theory** in order to combine the source of value and its measurement, considering one particular thing, applying the required valuation standards. These last, in turn, take on significance in order to:

"Facilitating cross-border transactions and contribute to the viability of international property markets, promoting transparency of financial reporting, as well as valuations for financial, legal and tax. ... Serve as a reference for appraisers from around the world to meet the requirements of reliable assessments and meet the requirements of the international business community. ... Provide valuation standards and financial reporting to meet the needs of developing countries and newly industrializing countries."⁶

⁶ Translate from the Spanish version of the **IVS 2007**, p. 27.
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According to the referred theories and in consideration to the essentials of the international standards about valuation and financial reporting and accounting, a solution to the problem is conceived such that: a) harmonizes the concepts of **exchange value** and **use value**; b) considering the combination of Valuation Fundamentals Principles related to substitution, highest and best use, externalities, supply and demand, conformity, progression and regression, contribution, law of increasing returns and law of decreasing returns, balance, competition, change, opportunity cost, theory of distribution, surplus productivity, and anticipation; and, c) what in the **IVS** are considered as **market value** and **not market value**, as well as **fair value** specified in the **IFRS**, the **IAS** and the **IPSAC**.

The theoretical framework is complemented designing the solution by setting its application according with the formal protocol to be followed in the valuation in order to delivery and to present the appraisal report, besides any *ex post* activity that could be required by the client. That formal protocol covers the **following essential steps**:



Clear highlights only the key steps to illustrate the proposed solution

6. Basic premise to formulate the solution to the problem statement

"A person with sufficient financial capacity and lack of other options for better utility, would be willing to invest simultaneously in the development of any two sites, as long as, *ceteris paribus* (other things identical), the respective investments per unit saleable built area will report the same net income".⁷

7. Solution to the problem: Its conceived methodology and development

Methodologically the solution is deduced through the «**Real Estate Investment Indifference Approach**® -**The E3I**®-». This approach is conceived from the premise set out in paragraph 6 *ut supra*, considering the net profit of the following two (2) developments as joint investments: One, feasible on the site to be valued; and the other: factual on the site useful as reference. The method is instrumented through a **valuation analytical model** formulated according to the following equation, easy to computerize:

$$\begin{aligned} & \text{Net income after Tax per Unit of Construction Saleable Area of the} \\ & \text{Urban Real Estate Product PIU on Site 2 (Property Subject to Analyze)} \\ & = \\ & \text{Net income after Tax per Unit of Construction Saleable Area of the} \\ & \text{Urban Real Estate Product PIU on Site 2 (Property Reference)} \end{aligned}$$

According to that balance, the «actual or present value» of the **Net income after Tax per Unit of Construction Saleable Area of the Urban Real Estate Product PIU** in either one of the two (2) sites is evaluated using the following equation:⁸

$$\begin{aligned} & \text{Present Value of Net Income per Unit of Saleable Area} \\ & = \\ & \frac{(\text{Present Value of Total Revenue} - \text{Present Value of Cost of PIU}) * (1 - \text{isr})}{\text{Saleable Area ACV}} \end{aligned}$$

⁷ This premise requires to consider the both investment as two possibilities together and not as alternatives. If this last were the case, it would be required the marginal analysis of them. For the evaluation, each investment of the pair must cover the respective site and improvement values.

⁸ In the equation, **isr** = **tax on income as fraction of the unit**. The acronyms used in the equations come from its initials in Spanish.

being:

$$\text{Total Income} = \text{Saleable Area } \mathbf{ACV} * \text{Sale Unit Price } \mathbf{PUV}$$

$$\mathbf{PIU} \text{ Cost} = \text{Site Area } \mathbf{ATE} * \text{Unit Value Site } \mathbf{VUT} + \text{Construction Area } \mathbf{ABC} * \text{Unit Value Construction } \mathbf{VUC}$$

$$\mathbf{ACV} = \frac{\text{Saleable Area } \mathbf{ACV}}{\text{Construction Area } \mathbf{ABC}} * \frac{\text{Construction Area } \mathbf{ABC}}{\text{Site Area } \mathbf{ATE}} * \mathbf{ATE}$$

or, what is the same that:

$$\mathbf{ACV} = \text{Saleable Area Factor } \mathbf{fav} * \text{Construction Area Permitted Factor } \mathbf{fcp} * \mathbf{ATE}$$

Consequently, the equilibrium equation, as mathematical model, can be written as follows (Equation 1):

$$\frac{[\mathbf{ACV}_1 * \mathbf{PUV}_1 - (\mathbf{VUT}_1 * \mathbf{ATE}_1 + \mathbf{VUC}_1 * \mathbf{ABC}_1)] * (1 - \text{isr}_1)}{\mathbf{ACV}_1} = \frac{[\mathbf{ACV}_2 * \mathbf{PUV}_2 - (\mathbf{VUT}_2 * \mathbf{ATE}_2 + \mathbf{VUC}_2 * \mathbf{ABC}_2)] * (1 - \text{isr}_2)}{\mathbf{ACV}_2}$$

where for the \mathbf{PIU}_1 :

$$\mathbf{ACV}_1 = \mathbf{PIU}_1 = \mathbf{fav}_1 * \mathbf{fcp}_1 * \mathbf{ATE}_1$$

\mathbf{PUV}_1 = Unit Sale Price of the of the \mathbf{PIU}_1 Saleable Area

\mathbf{VUT}_1 = Site 1 Value Unit

\mathbf{ATE}_1 = Site 1 Area

\mathbf{VUC}_1 = Unit Construction 1 Value

= Unit Construction of the \mathbf{PIU}_1 , including the overhead and contractor's profit, plus the value of the associated entrepreneurial and management
= $\mathbf{CUC}_1 * (1 + \text{representative fraction of entrepreneurial and management})$
= $\mathbf{CUC}_1 * (1 + \mathbf{fga}_1)$
= $\mathbf{CUC}_1 * \mathbf{Fga}_1$ being \mathbf{Fga}_1 the adjustment factor to the cost of construction \mathbf{CUC}_1 , needed to include the cost of management and entrepreneurial profits required to produce and market the \mathbf{PIU}_1

$$\mathbf{ABC}_1 = \text{Construcción Area 1} = \mathbf{fcp}_1 * \mathbf{ATE}_1$$

isr₁ = Applicable Income Tax in case 1, as a fraction of the unit.

and, for the **PIU₂**:

ACV₂ = **PIU₂** = **fav₂ * fcp₂ * ATE₂**

PUV₂ = Unit Sale Price of the of the **PIU₂** Saleable Area

VUT₂ = Site 2 Value Unit

ATE₂ = Site 2 Area

VUC₂ = Unit Construction 2 Value
 = Unit Construction of the **PIU₂**, including the overhead and contractor's profit, plus the value of the associated entrepreneurial and management
 = **CUC₂ * (1 + representative fraction of entrepreneurial and management)**
 = **CUC₂ * (1 + fga₂)**
 = **CUC₂ * Fga₂** being **Fga₂** the adjustment factor to the cost of construction **CUC₂**, needed to include the cost of management and entrepreneurial profits required to produce and market the **PIU₂**

ABC₂ = Construcción Area 2 = **fcp₂ * ATE₂**

Isr₂ = Applicable Income Tax in case 1, as a fraction of the unit.

The equilibrium equation **Equation 1**, assuming the same tax rate for both investments (**isr₁ = isr₂**), can be re-expressing as follows:

$$\frac{fav_1 * fcp_1 * ATE_1 * PUV_1 - VUT_1 * ATE_1 - VUC_1 * fcp_1 * ATE_1}{fav_1 * fcp_1 * ATE_1} = \frac{fav_2 * fcp_2 * ATE_2 * PUV_2 - VUT_2 * ATE_2 - VUC_2 * fcp_2 * ATE_2}{fav_2 * fcp_2 * ATE_2}$$

what is the same that:

$$\frac{fav_1 * fcp_1 * PUV_1 - VUT_1 - VUC_1 * fcp_1}{fav_1 * fcp_1} = \frac{fav_2 * fcp_2 * PUV_2 - VUT_2 - VUC_2 * fcp_2}{fav_2 * fcp_2}$$

from which:

$$VUT_2 = fav_2 * fcp_2 * PUV_2 - fcp_2 * VUC_2 - \frac{fav_2 * fcp_2}{fav_1 * fcp_1} [fav_1 * fcp_1 * PUV_1 - VUT_1 - fcp_1 * VUC_1]$$

or, substituting **VUC** by **CUC * Fag** (= Fag * CUC) for each **PIU**, results the Equation 2:

$$VUT_2 = fav_2 * fcp_2 * PUV_2 - fcp_2 * Fga_2 * CUC_2 - \frac{fav_2 * fcp_2}{fav_1 * fcp_1} * [fav_1 * fcp_1 * PUV_1 - VUT_1 - fcp_1 * Fga_1 * CUC_1]$$

With the appropriate magnitudes for the variables that make up the terms of the right member of **Equation 2**, the variable under analysis **VUT₂** is evaluated. That is, the unit value, at the valuation date, that logically and at most could have the site under analysis according to the net income which have to produce per unit of marketable developable area taken into account the net income possible to be generated by investment in the real estate development on the reference site. In other words, because of the balance in the investment property on both sites, given their net profit per unit of salable area.

To quantify the different variables included in **Equation 2** when the **PIU** is a real estate reference on the secondary market, it is important that the value of the building component of that property corresponds to its current value from the market perspective. In this way, that value reduces the inaccuracies inherent in the estimates of depreciation and externalities. This is possible by applying the «**Matrix Valuation Approach**©® -**The EVM**®-»⁹ whenever this approach is assessed directly and simultaneously, at the valuation date, to the «current total value» of the product and its «value structure site-improvements», since values are figure out by analysis-synthesis of the expressions of the market. In these cases, **CUC₁ = VUC₁ ÷ (1 + fga₁ = 0) = VUC₁**, being **VUC₁** the deductible by the **EVM**®.

To have the greatest possible confidence in the estimate, it is important to assess the **VUT₂**, as feasible, from at least two **PIU** as references with **VUT's** estimated independently of one another.¹⁰ And, at the same time, in order to analyze the sensitivity of the resulting **VUT₂** as variations in critical variables involved in its formulation; namely:

⁹ Already referred in the section 1 in this document.

¹⁰ Otherwise, there would be no difference in **VUT₂** deduct from one or the other **PIU's** taken as references.

PUV₁, **PUV₂**, **VUT₁**, **VUC₁** (= CUC₁ + fga₁) and **VUC₂** (= CUC₂ + fga₂). Criticality arises: a) in the variables and **PUV₂** y **PUV₁** because both are based on *ad hoc* estimates, with more or less error depending upon the available information;¹¹ b) in **VUT₁** because the difficulties and uncertainties that always involves the site valuation; and, c) in **VUC₂** y **VUC₁** due to the margins which may have their magnitudes since they are based on estimates that not always are easy to quantify: On one hand, because the depreciated cost which involved the need of deciding between reproduction or replacement cost as new, and also the need to estimate the endogenous depreciation and externalities; and, on the other, because the intangible costs that are associated with the generation and marketing of the **PIU**.

The proportional changes in **VUT₂** because of the changes in comment are calculated from the **Equation 2**:

$$\Delta \text{VUT}_2 \% = - \text{fav}_2 * \text{fcp}_2 * \frac{\text{PUV}_1 * \Delta \text{PUV}_1}{\text{VUT}_2} \Leftarrow \Delta \text{PUV}_1 \text{ expresada en variación \%}$$

$$\Delta \text{VUT}_2 \% = \text{fav}_2 * \text{fcp}_2 * \frac{\text{PUV}_2 * \Delta \text{PUV}_2}{\text{VUT}_2} \Leftarrow \Delta \text{PUV}_2 \text{ expresada en variación \%}$$

$$\Delta \text{VUT}_2 \% = \frac{\text{fav}_2 * \text{fcp}_2 * \text{VUT}_1 * \Delta \text{VUT}_1}{\text{fav}_1 * \text{fcp}_1 * \text{VUT}_2} \Leftarrow \Delta \text{VUT}_1 \text{ expresada en variación \%}$$

$$\Delta \text{VUT}_2 \% = \frac{\text{fav}_2 * \text{fcp}_2 * \text{VUC}_1 * \Delta \text{VUC}_1}{\text{fav}_1 * \text{VUC}_1 * \text{VUT}_2} \Leftarrow \Delta \text{VUC}_1 \text{ expresada en variación \%}$$

$$\Delta \text{VUT}_2 \% = - \text{fcp}_2 * \frac{\text{VUC}_2 * \Delta \text{VUC}_2}{\text{VUC}_2 * \text{VUT}_2} \Leftarrow \Delta \text{VUC}_2 \text{ expresada en variación \%}$$

Once the viable estimates or estimates for **VUT₂** are done, the «**conclusive valuation**» is establishing following the regulatory compliance protocol: Review, validation, reconciliation and reaffirmation of results. The reaffirmation, besides the one resulting directly from the application of **E3I®**, could also be done following an alternative criterion

¹¹ The effects of variations in **VUT₂** due to **PUV₂**'s variations are identical to variations of the same magnitude in the proportion **PUV₂/PUV₁**.

to reach the already virtually conclusive estimate. To assess the confidence probability level of the estimated a practical criterion can be applied: To consider the estimate standard error equal to one sixth of the range of values deduced by different reasonable ways according to the application of the **E3I®** to at least two pairs of investments, each one including the site subject to valuation.¹²

8. An illustrative example¹³

To value, at constant prices of the valuation date: 31-AGO-2010, a site planned for commercial and professional activities, located in a residential area characterized by single-family and multistory homes, called Loma Linda, located in Caracas, Venezuela. The site, identified as CC-03, has an approximate area of 2,746.88 mts.² 100% useful. In that urbanization and adjacent neighborhood there are not other sites for the same use. The assessment is required to estimate the market value of the parcel as required by the bank for a mortgage. Also, the valuation is necessary to update the financial reports of the owner-promoter of the improvements to be carried out, according with the financial information international standards.

The basic dimensions of the improvements to build on the site are: **15,822.86 m²** as **gross building area**, and **10,200.31 m²** of **total salable area**. Other data, information and relevant considerations for the valuation are obtained from the evaluation of official sales prices, offers, construction costs formulated by specialized firms and own estimates of associated costs by entrepreneurial and management activities: 66% - 199% on construction costs.¹⁴ Some illustrative views of both: the site and the projected development of interest are:

¹² It is assumed that the distribution of the sample means of the estimates follows a Normal Function (Gauss), whose range is approximately 6 times the standard error. For a more rigorous theoretical analysis of the case, but without better approximate practical results, it could be applied theory of errors, considering the errors that may have the different variables included in the calculation, and thus, its effect on the outcome. This analysis is beyond the scope of this paper whose only purpose is to expose the essentials of **E3I®**.

¹³ The details of the example are summarized in order to illustrate only the fundamentals of the **E3I®**.

¹⁴ The range 66% -199% is figured out on estimates made by the author of this paper, in Venezuela. The specific percentage on the construction cost depends on the regional market in which properties are analyzed.

Venezuela



Site to be valued



Virtual model of the improvement to be made on the site to be valued



Caracas



Typical residential homes (single and multiple) in Loma Linda



Loma Linda neighborhood



For the valuation the **E3I®** is applied considering two (2) property baselines: one, in the primary market; the other, on the secondary market. Applying **E3I®** it is estimated that the unit value of the site under consideration might be between 5,449.81 and 6,211.61 USD per square meter. The approximately average value is **USD 5.831/m²** with a typical error of about **± 2.18%**; this is an estimated within a range of **± 4.28%** with **95% confidence probability**.¹⁵ The estimates are accompanied with the necessary sensitivity analysis to target the variables that merit further estimated attention. These results and the calculations are shown in the two (2) tables inserted below:

¹⁵ Standard error $\approx (6,211.61 \text{ to } 5,449.81) \div 6 = 126.97$, which approximately represents 2.18% to 5,830.71. Assuming a normal sampling distribution of the estimate, the result is considered acceptable within the range $5,830.71 \pm 1.96 * 2.18\% \approx \mathbf{5,831 \pm 4.28\% \text{ with } 95\% \text{ confidence probability}}$. This estimate means: if 100 assessments of the case are done, it is expected that 95% of them are within the range indicated.

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Calculations Based on the Econometric Analysis Appraisal HJGuerra® - AEA® HJGuerra® - AEA®
Valuation of the Commercial Site CC 03 vs. Residential Site - Loma Linda - Appraise at AUG 31th. 2010, at current price of this date

Table of Values and Calculations - Analysis for Urban Real Estate Products in Market: Primary						
#	Concept	Source	Pivot Real Estate 1	Object Real Estate 2		
1.	Saleable Area ACV = (4) * (7) * (8)	M2 Estimated by calculation	575,40	10.200,46		
2.	Present Value Unit Price Sale PUV	USD/M ² Estimated by valuation	1.949,00	2.972,00		
3.	Present Value Expected Gross Income = (1) * (2)	US Estimated by calculation	1.121.454,60	30.315.772,97		
4.	Useful Site Area ATE	M2 Estimated by calculation	685,00	2.746,88		
5.	Site Unit Value VUT	USD/M ² Estimate by calculation	264,00	5.449,81		
6.	Site Value = (4) * (5)	USD Estimated by calculation	180.840,00	14.969.982,49		
7.	Construction Area Permitted Factor fcp	Facts and Legal Requirements	120,00%	576,00%		
8.	Saleable Area Factor fav	Estimated by analysis	70,00%	64,47%		
9.	Construction Area ABC = (7) * (4)	M2 Estimated by analysis	822,00	15.822,03		
10.	Present Value Unit Construction Cost CUC	USD/M ² Estimated by valuation	500,00	465,00		
11.	Entrepreneurial and Management Factor fga	Estimado by analysis	100,00%	80,00%		
12.	Construction Unit Value VUC = (10) * [1 + (11)]	USD/M ² Estimated by valuation	1.000,00	837,00		
13.	Improvement Value = (9) * (12)	USD Estimated by calculation	822.000,00	13.243.038,11		
14.	Present Value of the Investment on PIU = (6) + (13)	US Estimated by calculation	1.002.840,00	28.213.020,59		
15.	Gross Utility before taxes = (14) - (3)	USD Estimated by calculation	118.614,60	2.102.752,37		
16.	Tax Income ISLR	Estimated by Legal Rules	30,00%	30,00%		
17.	Net Profit after tax ISLR = (15) * [1 - (16)]	USD Estimated by calculation	83.030,22	1.471.926,66		
18.	Net Proportional Return after Tax (ISLR) by USD Invested = (17)/(14) %	Estimated by calculation	8,2795%	5,2172%		
19.	Net Income after Tax(ISLR) by M2 of Saleable Area = (17)/(11) USD/M²	Estimated by calculation	144,30	144,30		
20.	Site Estimated Unit Value = (5)	USD/M ² Estimated by the E3I®	264,00	5.449,81		
21.	With: 1) ΔPUV1, 2) ΔPUV2, 3) ΔVUT1, 4) ΔVUC ₁ y 5) ΔVUC ₂ : then ΔVUT ₂ :		1) 3,77% 2) 2,47% 3) 23,35% 4) 5,14% 5) 10,00%			
			1) -5,00% 2) 5,00% 3) 5,00% 4) 5,00% 5) -8,85%			
22.	Sensitivity of VUT ₂ respect to another variable = Δ VUT ₂ / Δ ... :		-1,33 2,03 0,21 0,97 -0,88			
23.	Attention Priority to the magnitudes of the variables:		2° PUV ₁ 1° PUV ₂ 5° VUT ₁ 3° VUC ₁ 4° VUC ₂			

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#	Concept	Source	Pivot Real Estate 1	Object Real Estate 2		
1.	Saleable Area ACV = (4) * (7) * (8)	M2 Estimated by calculation	415,58	10.200,46		
2.	Present Value Unit Price Sale PUV	USD/M ² Estimated by valuation	1.673,00	2.972,00		
3.	Present Value Expected Gross Income = (1) * (2)	US Estimated by calculation	695.272,03	30.315.772,97		
4.	Useful Site Area ATE	M2 Estimated by calculation	519,48	2.746,88		
5.	Site Unit Value VUT	USD/M ² Estimate by calculation	672,00	6.211,61		
6.	Site Value = (4) * (5)	USD Estimated by calculation	349.090,66	17.062.534,40		
7.	Construction Area Permitted Factor fcp	Facts and Legal Requirements	80,00%	576,00%		
8.	Saleable Area Factor fav	Estimated by analysis	100,00%	64,47%		
9.	Construction Area ABC = (7) * (4)	M2 Estimated by analysis	415,58	15.822,03		
10.	Present Value Unit Construction Cost CUC	USD/M ² Estimated by valuation	832,00	465,00		
11.	Entrepreneurial and Management Factor fga	Estimado by analysis	0,00%	80,00%		
12.	Construction Unit Value VUC = (10) * [1 + (11)]	USD/M ² Estimated by valuation	832,00	837,00		
13.	Improvement Value = (9) * (12)	USD Estimated by calculation	345.765,89	13.243.038,11		
14.	Present Value of the Investment on PIU = (6) + (13)	US Estimated by calculation	694.856,45	30.305.572,51		
15.	Gross Utility before taxes = (14) - (3)	USD Estimated by calculation	415,58	10.200,46		
16.	Tax Income ISLR	Estimated by Legal Rules	30,00%	30,00%		
17.	Net Profit after tax ISLR = (15) * [1 - (16)]	USD Estimated by calculation	290,91	7.140,32		
18.	Net Proportional Return after Tax (ISLR) by USD Invested = (17)/(14) %	Estimated by calculation	0,0419%	0,0236%		
19.	Net Income after Tax(ISLR) by M2 of Saleable Area = (17)/(11) USD/M²	Estimated by calculation	0,70	0,70		
20.	Site Estimated Unit Value = (5)	USD/M ² Estimated by the E3I®	672,00	6.211,61		
21.	With: 1) ΔPUV1, 2) ΔPUV2, 3) ΔVUT1, 4) ΔVUC ₁ y 5) ΔVUC ₂ : then ΔVUT ₂ :		1) 2,37% 2) 2,56% 3) 14,17% 4) 10,17% 5) 10,17%			
			1) -2,37% 2) 4,55% 3) 7,12% 4) 5,06% 5) -7,89%			
22.	Sensitivity of VUT ₂ respect to another variable = Δ VUT ₂ / Δ ... :		-1,00 1,78 0,50 0,50 -0,78			
23.	Attention Priority to the magnitudes of the variables:		2° PUV ₁ 1° PUV ₂ 4° VUT ₁ 5° VUC ₁ 3° VUC ₂			

To validate the estimated unit value obtained by the **E3I®** an alternative estimated is deducted by the approach based on the «potential development» of the site. The result: **USD 6,134.96 / m²**, which, with its corresponding sensitivity analysis, are shown below:

Present Value of the Site According to Its «Hypothetical Use or Development», Loma Linda, at AGU 31, 2010				
#	Concept	M2	USD/M2	Valor Total USD
1.	Saleable Area ACV y its Present Value	10.200,46	2.972,00	30.315.767,12
2.	Construction Area ABC	15.822,03	465,00	7.357.243,95
3.	Entrepreneurial and Management Factor fabg = %/(2) = 83%		385,95	6.106.512,48
4.	Construction Present Value = (2) + (3)		850,95	13.463.756,43
5.	Site	2.746,88	6.134,96	16.852.010,69
6.	With: 1) Δ PUV y 2) Δ VUC en %:		2,78%	6,26%
	τηεν ΔVUT ₂ :		5,00%	-5,00%
7.	Sensibilidad de VUT según variaciones en las variables:		1,80	-0,80

Fórmulas para los cálculos:
 $(Income - Cost) * (1 - isr) = (AVE * PUV - ABC * VUC - ATE * VUT) * (1 - isr) = 0 \Rightarrow VUT = \frac{AVE * PUV - ABC * VUC}{ATE}$

$\Delta VUT \% = \frac{AVE}{ATE * VUT} * PUV * \Delta PUV \Leftarrow \Delta PUV \text{ en } \%$
y
 $\Delta VUT \% = - \frac{ABC}{ATE * VUT} * VUC * \Delta VUC \Leftarrow \Delta VUC \text{ en } \%$

As noted, the value, according to this criterion, would be within the range of estimates by the **E3I®**. Therefore, it is reasonable to appoint that the estimated by the **E3I®**: **USD 5,831/M2 ± 4.28% with 95% confidence probability** can be taken as the **conclusive value** to define the **market value** of the site being valued. This conclusion is reaffirmed since the result comes from the balance in net income per unit of marketable buildable area from two (2) possible real estate investment sets, each including the site to be valued. At the same time, because of being a similar value to that obtained by the «exploitation scenario», but considering that if only this latter criterion would be applied, there would no be alternative comparison results to arrive at a conclusive value. Nor would know the value of the site according to their economic potential in conjunction with the possible in any other sites; neither it will be known which variables would merit more or less attention for its valuation.

Moreover, the result **USD 5.831/m²** (average within the range 5,449.81 - 6,211.61) might be judged on the criteria of **net proportional return of the investment** rather than the **net income per unit of salable area**. In that case, with the appropriate formulation the

estimated average value would be **USD 5.628/m²** in the range **5,048.01 - 6,208.72**.¹⁶ This result, in any case, would reaffirm that the expected value of interest would fall within the range **5.450 - 6209**¹⁷, validating, therefore, the one decided under the perspective of **net income per unit of salable area -the E3I®-**. It has to be appointed that the difference between the indicated average results is not greater than 3.60% (USD 5,831/m² vs. USD 5,628/m²).

9. Benefits derived from the formulated settlement

- ✓ It allows in a relative simple way, but in strict accordance with the **Fundamental Principles of Valuation**, the **IVS**, the **IFRS**, the **IAS**, the **IPSAS** and the **logic of the net income per unit of salable area**: To estimate the value that, at most, could have a vacant site considering the net income per unit buildable area that it might produce, given the factual or viable ones on improved sites taken as references, not necessarily located in the same urban area; consequently, facilitates the valuation of the vacant urban site in any real estate market of interest, quite active or not, whether local, regional, national or global.
- ✓ The solution validates the results expeditiously and specifically by itself, without the need of alternative methods, such as required when applying conventional methods, contributing also to create benchmark values for evaluating estimates by any other criteria.
- ✓ Helps to improve the interpretation of the market, even where there is few information; and, thus improving the objectivity, productivity and confidence levels estimations in the site valuation; as well as pointing out the attention to the variables of greatest impact on its magnitude.
- ✓ It is useful to estimate **Non-Market Values** and **Cadastral Value Plants** according to the **IVS**, as well as **fair values** under the **IFRS**, the **IAS** and the **IPSAS**.

¹⁶ The explanation and application of this criterion is done under the «The Equilibrium of the Net Return Real Estate Investment Approach©© -The ERI®-» described in *ad hoc* document, also authored by the undersigned this. The basic calculation formula under this approach is:

$$VUT_2 = \frac{fav_2 * fcp_2 * PUV_2}{fav_1 * fcp_1 * PUV_1} * (VUT_1 + CUC_1 * Fga_1 * fcp_1) - CUC_2 * Fga_2 * fcp_2$$

¹⁷ The more closely within the limits of the results at issue. If so, the expected average would be \approx **USD 5,830** \approx $(5,450 + 6,209) / 2$.

- ✓ If necessary, it provides a platform for valuing urban sites from the perspective of marginal investment analysis, considering the site to value as an investment alternative rather than as part of a pair of merged investment.
- ✓ Being useful for the valuation, accounting and financing of urban real estates from a universal perspective in open economies, the proposed solution is also a good tool to manage them in any market, whether local, national or global, including stagnant and/or depressed environment, with or without sufficient comparables.

10. The main conclusions and actions to follow

- ✓ The valuation of urban real estates presents constant challenges to improve and to overcome the common difficulties, costs, time and subjectivity, especially when the markets are imperfect as usually they are; and, in particular when it is necessary to value vacant urban sites because of the progressive limitations on offers, huge growth on the demands and increasingly stringent regulations on their property. In this paper a viable solution is proposed to overcome such difficulties based on the unitary net income which, as minimum, have to produce the improvements on the site when this is considered as part of a merged set of investments: **«The Real Estate Investment Indifference Approach©® -The E3I®-**.
- ✓ Given the strengths of the **E3I®** is appropriate to disseminate and to implement it in order to: a) valuing the site with relative ease but with conceptual consistence, especially when conventional methods have limitations; b) to build on the experiences to improve progressively the **IVS** and the qualified professional appraising; and , c) strengthen the real estate management.
- ✓ To continue develop the approach by implementing it from dynamic and probabilistic considerations so that possible sets of values could be gotten from investment simulation, in amounts and timing, diverse sales plans as well as different financial costs and management costs associated with housing developments.

11. Some basic references

- *International Valuation Standards Committee (2007): international Valuation Standards. London. GB.*

- *Appraisal Institute (2008): The Appraisal of Real Estate. 13° Ed.. Chicago. USA.*

12. Brief author's curriculum vitae

✚ Electrical Engineer (Central University of Venezuela, 1964). MSc. in Industrial Management and MSc. in Operations Research (E.U.A., PIB today New York University, 1969, 1970). Certify on Industrial Regional Development (Netherlands, RVB, 1971), Smaller Enterprise Development (Japan, JICA, 1982) and Quality Leadership (Swedish Government, 1995). Certified on Real Estate Valuation (Venezuela, CIV, 1973, 1994). Specialist on Financial Institutions (Venezuela, Andrés Bello Catholic University, 1987). Following Doctoral Program on Administrative Sciences (Venezuela, Simón Rodríguez National University).



✚ Member of the Venezuelan Engineers College (CIV), the Appraisal Engineering Society of Venezuela, and the UPAV. Author of several universities careers for both, undergraduate and graduate studies; also for professional development. As professor teaches at the Central University of Venezuela and at the Venezuelan Army University. Also, coordinates the Specialist Graduate Studies on Real Estate, Machinery and Industries Appraisal at the Antonio José de Sucre National University in Venezuela. He is the coauthor and expositor of the **Modular Graduate and Continuous Education Plan in Valuation Engineering**, approved by the UPAV Extraordinary Congress 1995 (Caracas, Venezuela) as a new guide educative paradigm for the UPAV's Members.

✚ He has written, publisher and presented various articles on engineering, costing, valuation, management and education. Among them, the first Venezuelan Handbook to Formulate and Evaluate Professional Fees in the practice of Engineering, Architecture and Related Professions (CIV, 1973). He has been invited as speaker in Brazil, Canada, Colombia, Costa Rica, Cuba, United States of America, United Kingdom, Guatemala, Holland, Honduras, Japan, México, Peru, Dominican Republic, Sweden, Uruguay and Venezuela.

✚ Carry out the free exercise of the profession on Management, Finance, Cost and Valuation. Serves as Assistant Justice. He is Consultant-Director of **HJG Consultants** and Chairman-Counselor of the **Valuation and Productivity Institute, AC**, with offices in Venezuela.