ИССЛЕДОВАНИЯ СОВРЕМЕННОГО СОСТОЯНИЯ РЕКЛАМНОГО РЫНКА УКРАИНЫ

В статье проведен анализ объема медийного рекламного рынка Украины. Рассмотрена динамика объема таких видов медиа рекламы, как: ТВ-реклама, реклама в прессе, радио реклама, наружная реклама, реклама в кинотеатрах, Интернет-реклама и их целесообразность использования на промышленных и машиностроительных предприятиях. Рассмотрен объем рынка маркетинговых сервисов и объем рынка директ-маркетинга Украины.

Ключевые слова: рекламный рынок, рекламная стратегия, рынок маркетинговых сервисов, рынок директ-маркетинга.

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ІДЕНТИФІКАЦІЯ ТА КІЛЬКІСНЕ ВИРАЖЕННЯ НЕВИЗНАЧЕНОСТІ ОЦІНКИ НА РИНКУ НЕРУХОМОСТІ

Досліджено джерела об'єктивної, суб'єктивної і модельної невизначеності оцінки на ринку нерухомості. Доведено, що застосування більш адекватних моделей процесу ціноутворення дає змогу зрозуміти складні ризики та їх наслідки при прийнятті управлінських рішень на ринку нерухомості, проте не нівелює невизначеність. Обґрунтовано необхідність застосування концепції невизначеності з метою оцінки якості отриманих результатів.

Ключові слова: *ринок нерухомості, концепція похибки, концепція невизначеності, суб'єктивна невизначеність, об'єктивна невизначеність.*

1. Introduction

Deficiency of empirical data, due to lack of transactions involve a significant degree of valuation uncertainty of the property. The worsening macroeconomic situation, the fighting in eastern Ukraine, the hryvnia devaluation, reduced purchasing power led to lower liquidity of property market. The need to take into account the liquidity premium has become an additional factor of uncertainty at the property market. Given this fact, there is a need for scientific research and practical foundations to identify and quantify the degree of valuation uncertainty of the property.

2. The object of research and its technological audit

The object of research is the process of determining value factors for property market. Probabilistic nature and information closure of property market, irrational behavior of its members, originality and uniqueness of each property, a high degree of subjectivity in the identification of the market condition cause the inability to exactly determine the market value. Accordingly, it is necessary to define the characteristics of the accuracy and reliability of the results.

3. The aim and objectives of research

The aim of this article is to study the theoretical and methodological issues of identify and quantify the uncertainty of valuation results for properties.

The following tasks were solved:
— To conduct a comparative analysis of the error and uncertainty concepts.
— To investigate sources of valuation uncertainty at the property market.
— To develop valuation algorithm of properties in terms of probability theory.

4. Literature review

Since the process of calculating the property value is an economic measurement, it has completed determining the valuation accuracy. The founder of the Chicago School of economics in the early twentieth century marked the real psychology for valuation of economic processes requires recognition of the existence of two kinds of judgments: the formation of proper valuation and valuation of its reliability [1]. The problem of the accuracy and reliability of valuation of properties investigated in the works of many foreign and domestic scientists [2–7]. Most of the above authors used a classic approach to valuation of the quality of value measurement results that is based on the error concept. However, the classic approach is appropriate to apply in the case of measurement of physical quantities in linear metric scales. In a non-traditional field of measurement as the economy, more correctly applied approach, which is based on the uncertainty concept. Guide to the Expression of Uncertainty in Measurement [8] are significantly influenced the regulatory framework for measuring. Given the fact that herein the term «measure» is interpreted as «... a set of operations, which aim is to

determine the value of the measured value ...» [8], all the provisions of the modern concept of measurement can be used in the theory and practice of valuation.

5. Materials and methods of research

The methodological basis of this work is a set of methods for scientific knowledge of outlined problems, general principles, methods and tools that were used in research. The theoretical basis of the research was the works of domestic and foreign scientists in uncertainty of value factors of property market. The information base of research is materials of government portal, periodicals, research results of domestic and foreign scientists, international and European standards of valuation, international financial reporting standards, data on the Internet. Legal framework of research made applicable laws and regulations of Ukraine. Attainment of the objectives was carried out using the method of causation, system analysis, synthesis, systematization and generalization.

6. Research results

The aim of valuation process is to determine the specific type of value associated with the valuated object. According to the International Valuation Standards «... value isn't a fact and assessment of the most probable price that would be paid for goods or services that are offered for sale at a certain time ...» [9]. The most probable price, which the National Standard № 1 interpreted as market value [10] is a reflection of the deductive process of pricing both sides of the transaction — the seller and the buyer (investor). Ultimately, the final transaction price is influenced by subjective assessments of its members and usually doesn't match the calculated value of the property.

Variability in prices is due to the propensity of economic agents to irrational behavior at the market influenced by various psychological factors, different goals, needs, attitudes, varying degrees of awareness and others.

The report of the Forum on Financial Stability, submitted in April 2009, it was noted that the lack of methodology for disclosure of valuation uncertainty was one of the causes of the global financial crisis in 2008.It was emphasized that one of the objectives of financial institutions is to improve the quality of valuation methodology and a more complete disclosure of the valuation process and uncertainty associated with valuations [11].

Requirements for disclosure of uncertainty, «... inherent for cash flows of the asset or liability ...» regulated and International Financial Reporting Standards «Fair Value Measurement», issued by the International Accounting Standards Board in 2013. The standard set of fair value hierarchy, which has three levels of input methods for evaluating the fair value [12]:

1. Input data of the first level — a quotation price (unadjusted) in active markets for identical assets or liabilities to which the entity can access at the measurement date.
2. Input data of the second level — the input data (except quotation price attributed to the first level), confirmed by the market.
3. Input data of the third level — is the input data for the asset or liability that are not in the public domain.

It is clear that in the valuation of property we use the second and often third level.

Additionally, we note that in July 2012 the UK Association of Chartered Certified Accountants, Chartered Institute for Securities & Investment and «Long Finance» was proposed concept of confidence accounting [13]. The authors of the concept suppose that accounting based on discrete values of assets and liabilities is not enough for an objective valuation of the financial condition of the company and the related uncertainties and risks. The financial information must be assessed in terms of completeness and clarity for making financial decisions [13], Given the large number of sources of uncertainty, including the uncertainty of the external environment and market, lines of balance sheet, income and expense and cash flow statement proposed to enter as probability distributions using histograms and confidence intervals.

Uncertainty sources are completely disclosed in the working document «Uncertainty valuation» prepared by the International Valuation Standards Council, in particular [14]:

1. The status of valuator — a source of financial uncertainty. The accuracy and appropriateness of judgments of valuator depend on his skills, experience and the degree of independence of his position.
2. The volume of work — a source of material uncertainty that arises when the amount of research reduced below the level that normally would be expected to evaluate the specific asset for a specific purpose.
3. Market uncertainty — the result of financial, macroeconomic and political crises when market information is incomplete and possibly controversial.
4. Model uncertainty — the result of features of valuation models or chosen valuation method.
5. Input data uncertainty — the lack of empirical data is a source of financial uncertainty. Examples of output data uncertainties include:
   - If the data were taken from different sources and combined, there will be a range of fluctuations of market value.
   - If the data were taken from the archives and actualized at the valuation date.
   - If the data were taken from the existing analogs, the uncertainty may emerge from correction results.

In a working paper it is noted that uncertainty is inherent to any valuation, as analysis of imperfect markets involves weighing the expediency of available information necessary for the aim of valuation. Objective of uncertainty measurement lies not in choosing the worst case scenario or prediction of future value fluctuations, and to provide information on the measurement variability of fair value at the valuation date.

In the context of the above, we note that the classical approach to quality valuation of the results is based on the error concept is determined. According to the International Dictionary of Metrology «... the true quantity value in measurement description is considered as single unexplored in practice ...» [15]. True quantity value can be determined only due to the presence of errors (systematic and random) of measuring instruments.

However, the property market is stochastic system. The uncertainty concept is based on the assertion that «... as a result of incomplete description of the value there is not a single true quantity value but rather — a set of true values consistent with the definition. However, this set of values, in principle and in practice, is unknown ...» [15].

Estimated value of the market value is a random variable, causing uncertainty regarding the truth of the result even when all known or acceptable components of the error are evaluated and made appropriate changes. This uncertainty is associated only with the measurement process, not the measuring instruments. Founder of Solid State Physics L. Brillouin, which many books devoted to proving the existence of uncertainty in the process of learning, noted that measurement inaccuracy is secondary, it is a consequence of the existence of objective uncertainty [16].

For example, when calculating the value of properties, absolute and relative errors were very small. At the same time, the uncertainty degree (as a measure of uncertainty in the results) due to the random nature of the property market, heterogeneity of properties, valuator qualifications, etc. can be quite high. Given the fact that value is the probabilistic observation, it can accept the idea ofwell-known statistics W. J. Reichmann that «... Probability is a measure of uncertainty. Where everything is due, there is no place for conventional idea of probability, since there is no doubt ...» [17].

The valuation process is essentially a value measurement. According to DSTU-N 2681-94 «Metrology. Terms and definitions» [18], measurements are divided into direct and indirect, including consequential. According to L. Leifer in determining the market value using comparative approach (sales comparison method) we apply the method of direct measurements, and the revenue and expenditure — indirect method of measurement [7]. However, measured values is obtain directly from the experimental data for direct measurement, while for indirect — through calculations by measuring other values to which measured value is associated by functional dependence [18]. Each of the valuation methods essentially is the process of developing a mathematical model that establishes a link between the most probable price and pricing factors. Given this fact, it can be concluded that all three approaches to determining the value of properties are indirect measurements.

Algorithm for valuation of properties in terms of probability theory is presented in Fig. 1.

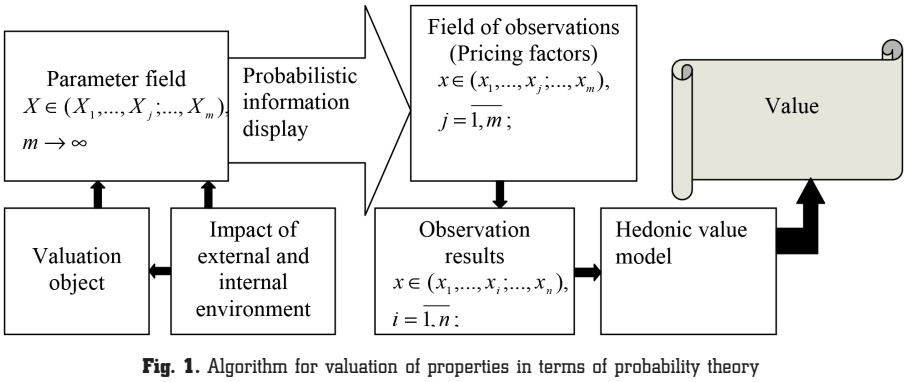

Fig. 1. Algorithm for valuation of properties in terms of probability theory

Each property contains an infinite amount of information. Characteristics of the valuated object on side ring factors influencing internal and external environment form a plurality of parameters, the number of items of which isn't limited. In the study, we put forward a number of hypotheses about the impact probability of evaluation object parameter to its price. Using the methods of inductive logic we can check the degree of confirmation of a hypothesis. However, when testing any finite number of hypotheses we can't know the infinite amount of information. During the probabilistic information display field of observation is formed, which is a certain amount of pricing factors. Valuation of the property based on observations carried out on the basis of the model function corresponding rules in the selected criteria.

Hedonic value model of property V is:

$$V = f_V(\beta_1 F_1,...,\beta_j F_j;...,\beta_m F_m) \pm U, \quad (1)$$

where V — the value of the property, UAH or USD; F_j — the pricing factor; j — the number of pricing factor $j = \overline{1,m}$; m — the number of pricing factors; β_i — the indicator of the contribution of i-th factor variable in the total value of the property; U — random variable, which includes the effect of outstanding factors, measurement features and random errors.

In determining the value of the property valuator chooses the way of specifying functional dependence (1). This widely used priori information and decision.

The use of more appropriate pricing models allows understanding the complex risks and their impact on decision-making in the management of properties, but not eliminates uncertainty.

In the context of the above, we note that we agree an outstanding scientist in the field of science and technology methodologies A. Ursul that in the process of learning must take into account not only subjective, but also objective uncertainty. «... The process of learning is the process of reflection an object by subject. During reflection in knowledge it can be reproduced and the uncertainty of the object of knowledge ...» [19]. A. Ursul notes that the thesis concerning the unity of certainty and uncertainty «... inextricably linked to the notion of knowledge as a reflection ...» [19]. Given the fact that the property market is inherently uncertain in order to better inform the customer about the pricing process and possible management decisions it is necessary to specify the overall level of uncertainty for final valuation.

Separately, we note that in addition to the quantitative aspect, there is a qualitative aspect of the information that we receive as the result of analyzing the property market and evaluated object. One of the most prominent qualitative features of information is value, which is directly linked to valuation. With the vast array of market data it should highlight only the information that is appropriate for chosen type of valuation and price. Additionally, we note that the valuation function is a decision necessary to solve a particular problem. The process of election of pricing factors with subsequent development of pricing model is taken place in any form. Therefore, in practice often used heuristic approach, which originally formulated the hypothesis, data are collected and classified, price model is developed and then its properties are

studied and checked. As shown by mathematician and philosopher J. Schrader, the assumption of statistical information theory that the less the initial knowledge of the subject, the more information it receives from the message, without adequate real properties of scientific knowledge. At sufficiently low level of initial knowledge the subject doesn't understand the message and doesn't define a significant amount of information [20]. Unskilled analyst with a lack of awareness can't make an adequate analysis of market data, which is a source of uncertainty of the results of subjective valuation.

Uncertainty level, as the error value, describes the accuracy of valuation and often calculated using the methods of mathematical statistics on similar algorithms (Table 1). However, there is a difference in interpretation of the law of probability distribution of random variables.

Table 1

Methods for calculating the error value and uncertainty level

Error	Uncertainty
Error characteristics: Standard deviation, or mean square deviation: $S_{\bar{x}} = \sqrt{\sigma^2}$, where $S_{\bar{x}}$ — standard deviation, UAH or $; σ — variance, UAH or $; $\sigma = \frac{1}{1-n}\sum_{i=1}^{n}(x_i - \bar{x})^2$	Uncertainty characteristics: Standard uncertainty u; Total uncertainty: $u_c = \sqrt{\sum_{i=1}^{n} u_i^2}$
Confidence interval: $P = 2t_{\alpha,k}\sqrt{\frac{\sigma^2}{n}}$, where $t_{\alpha,k}\sqrt{\frac{\sigma^2}{n}} = \Delta_{\bar{x}}$ — marginal value of marginal absolute error value, UAH or $; where α — significance level, $\alpha = 1 - p$; k — number of degrees of freedom, $k = n - 1$	Confidence level. Expanded uncertainty: $U_p = ku_c$, where k — coefficient of coverage, at $k = 2$ the level of confidence is approximately 95 %; at $k = 3$ the level of confidence is approximately 99 %
Interpretation of results. Interval: $P(-\Delta_p, +\Delta_p)$ contain error of measurement with probability p	Interpretation of results. Interval: $(V - U_p, +V + U_p)$ contains a larger share (p) of distribution of values that could reasonably be attributed to the measured value

Confidence boundaries of errors are «... the upper and lower bounds of the interval that covers measurement error with a certain probability ...» [18]. This is frequency interpretation of probability, which is determined on the basis of a sufficiently large number of experiments (in which case we can assume that the probability of an event is approximately equal to its relative frequency).

Uncertainty of measurement, as a parameter, is characterized the dispersion of a set of possible values of variables, not error of specific measurement result. «... For this measured value and for the result of measurement ... there is an infinite number of values, scattered around the result ... that with varying degrees of confidence can be attributed to the measured value ...» [21]. This is subjective interpretation of probability, which characterizes the degree of confidence. Given this fact, the uncertainty of valuation result is characterized by the interval, which is the range of prices against which we can say with great confidence that it is the real market value.

7. SWOT-analysis of research results

Strengths — knowledge of uncertainty level for valuation result will allow the person who takes investment or management solutions to properly assess risks and ensure optimal strategy for negotiations (to determine the lower limit of price reduction).

Weaknesses — a process of identify and quantify the uncertainty is very time-consuming process.

Opportunities — depending on the specific situation, the quantity and quality of available information and others, different methods of calculating the uncertainty interval, which will be the subject of further research, are chosen.

Threats — an unstable economic and political situation in our country, unforeseen scenarios of Russia's military aggression against our country and conflicting forecasts for the world market are major risk factors for adequate analytics of property market.

8. Conclusions

1. The classic approach to valuation of the quality of the results, which is based on the error concept, is determined. The true value can't be determined only due to the presence of errors of measuring instruments. In the approach, which is based on the uncertainty concept, the uncertainty of results related only to the process of measurement, not measuring instruments.

2. Objective uncertainty arises from the stochastic nature of the market, contradictory and incomplete market information. Model uncertainty is the result of inadequate valuation model or incorrectness of chosen valuation method. Source of subjective uncertainty at the property market is the low qualification of analyst.

3. Developed algorithm for valuation of properties in terms of probability theory made it possible to determine the difference in interpretation of the law of probability distribution of random variables in error concept and uncertainty concept. The error concept uses the frequency interpretation of probability, which is determined on the basis of a sufficiently large number of experiments. The uncertainty concept uses the subjective interpretation of probability, which characterizes the degree of confidence.

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ИДЕНТИФИКАЦИЯ И КОЛИЧЕСТВЕННОЕ ВЫРАЖЕНИЕ НЕОПРЕДЕЛЕННОСТИ ОЦЕНКИ НА РЫНКЕ НЕДВИЖИМОСТИ

Исследованы источники объективной, субъективной и модельной неопределенности оценки на рынке недвижимости. Доказано, что применение более адекватных моделей процесса ценообразования дает возможность понять сложные риски и их последствия при принятии управленческих решений на рынке недвижимости, однако не нивелирует неопределенность. Обоснована необходимость применения концепции неопределенности с целью оценки качества полученных результатов.

Ключевые слова: рынок недвижимости, концепция погрешности, концепция неопределенности, субъективная неопределенность, объективная неопределенность.

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АНАЛІЗ РЕЗУЛЬТАТИВНОСТІ ВИКОРИСТАННЯ КАПІТАЛУ АКЦІОНЕРНИХ ТОВАРИСТВ БУДІВЕЛЬНОЇ ГАЛУЗІ УКРАЇНИ

У даній статті проаналізовано стан будівельної галузі України та проведено дослідження діяльності обраних будівельних компаній шляхом аналізу рентабельності їх власного капіталу. Виявлено основні фактори впливу на рівень прибутковості власного капіталу акціонерних товариств будівельної галузі, здійснено порівняння з результатами німецької будівельної компанії.

Ключові слова: *власний капітал, рентабельність, методика DuPont, рентабельність реалізації, рентабельність активів.*

1. Вступ

Важливою складовою механізму управління капіталом в системі забезпечення корпоративної безпеки є аналіз результативності його використання. Такий аналіз дозволяє визначити основні фактори, що впливають на ефективність діяльності та управління ресурсами компанії, допомагає визначити можливі резерви зростання прибутку. Якщо керівництво підприємства ефективно працює, воно в цьому впевнюється. Якщо ж управління не зовсім ефективне, керівництво не тільки буде знати про це, але також буде чітко бачити чому і що вони можуть з цим вдіяти. Аналіз результативності на рівні підприємства дозволить побачити його сильні та слабкі сторони, а відтак зробити висновки щодо потрібних заходів з підвищення рівня інвестиційної привабливості та корпоративної безпеки акціонерного товариства.