

# PRACTICAL APPLICATION OF INTANGIBLE ASSET VALUATION APPROACHES AND METHODS

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## **ABSTRACT**

*Intangible assets and its valuation is a recent phenomenon. This is despite the fact that intellectual property has been around for several centuries. Today, matters are more complicated, and integrated IP management is required. When valuing intangible assets, we consider each of the different valuation methodologies, in light of the information available and the specific circumstances, in order to determine the best method for ascertaining value. The methodologies commonly used to determine the value of intangible assets are: the Cost Approach, the Market Approach, the Income Approach. This article is intended to be an overview of the most widely used valuation methodologies and its practical application.*

## **KEY WORDS**

*Intangible assets. Value. Valuation. Quantitative approach.*

## **JEL CLASSIFICATION**

*G12.*

## **INTRODUCTION**

Issues surrounding the management of technology have changed because the global economy has changed, and intangible assets have become more salient. The imperative for the integrated management of intangible assets stems from changes in the global economy and changes in business organization. These changes in the global economy, both separately and collectively, are requiring that both innovative and imitative firms place greater importance on intangible assets and its valuation.

Valuation of intangible assets represents one of the most delicate problems. This paper attempts to critically analyze prevailing methods for valuation of intangible assets and contains sample examples of calculation its value.

## 1 THEORETICAL BACKGROUND

This chapter includes a list of definitions and classification of intangible assets and a basic description of each valuation approach.

### 1.1 Definition of Intangible Assets

According to Smejkal (2010), an intangible asset can be conceptually defined as property consisting of a specific intellectual content, the objective expression of which is capable of being the subject of social relations, without the necessity of its embodiment in material form. Objectivization allows to perceive intangible assets sensually (usually by sight or hearing), just as any tangible asset (i.e. an asset expressed in an objective material form) is perceptible by touch.

From an economic point of view, Bouteiller, (2010) suggests a generally applicable definition of the term “intangible asset”, under which an intangible asset is the result of past events, characterized by three characteristics: they are not material in nature, are capable of generating future net income, and are legally or otherwise protected.

The new Civil Code addresses the issue of intangible assets in Section 496, which defines it as follows: "*Incorporeal things are rights whose nature allows it, and other things without corporeal substance.*" Smejkal (2010) further states that, in legal terms, not all intangible assets are subject to rights to intangible assets. The subject of these rights includes only those intangible assets that are governed by special legislation for which the socio-economic conditions have been created in which the legal and political reasons for such legislation are based.

An intangible asset is a relatively new phenomenon in the field of accounting and taxation. The International Financial Reporting Standards deal with intangible assets in IAS 38. An intangible asset from the perspective of IAS 38 must be: "... identifiable, controlled by an entity and capable of bringing future economic benefits."

It follows from the above that designations and definitions vary depending on the perspective. It can be said that *intangible property* is understood as a wider concept. When identifying the market value, however, the term *intangible asset* is generally used.

## 1.2 Classification of Intangible Assets

The diversity of intangible assets also causes difficulties in their classification. A clear division based on their characteristics is provided by Malý (2007), who divided intangible assets into the following groups:

### 1. Intangible results of creative intellectual activity:

- The actual content of an idea: patent-protected inventions or engineering solutions, utility models and industrial designs, semiconductor topographies, plant varieties, etc.
- The way of expressing or rendering ideas: copyright work including computer programs and database structure, performances of artists performing copyright works.

### 2. Intangible results of experience and other intellectual activities: know-how, business secrets, audio records, audio-visual records, etc.

### 3. Intangible values of personality:

- Values and manifestations of an individual's personality, e.g. honour, name, human dignity, privacy, personal expressions
- Personal data of a natural person

### 4. Expression of the economic individuality of an entity and its product and activities:

- Protective marks - trademarks, designation of origin and geographical indication, company name, logo, or other expression of the entrepreneur
- Name of the legal entity
- Goodwill

For the sake of completeness I should also mention the classification used in foreign literature. According to Contractor (2001), intangible assets are divided into three sets, which together form corporate knowledge. The first group includes registered assets protected by industrial and intellectual property rights, such as inventions, utility and industrial designs, trademarks, copyright. The second group contains the elements of the first group, and includes all unprotected intangible assets (drawings, plans, manuals, know-how, business secrets). The third group includes intangible assets from the previous group and other intangible assets such as: collective corporate knowledge, employee skills and knowledge, customer satisfaction, corporate culture.

Besides the term 'intangible property', the term *intellectual property* is used. According to Blair (2005), **intellectual property** consists of all intangible assets that are capable of being the subject of private relations of their owners and have a certain, at least potential, property value.

Svačina (2010) states that intellectual property includes industrial property rights and copyrights. Industrial ownership is a narrower concept, which only includes a part of intellectual property. Industrial property is created on the basis of a decision by the Industrial Property Office to grant protection. Industrial property is the sum of the absolute rights to intangible assets that must be industrially usable. (For details see Table1)

Table 1 Classification of Intellectual Property

Intellectual Property			
Copyright	Industrial Property Rights		
Copyright works	Engineering solution	Right to designation	Related Rights
Related works	Invention	Trademarks	Industrial design
Software	Utility model	Designation of origin	Know - how
Databases	Semiconductor topography	Geographical indication	Plant varieties
		Business name	Breeds of animals
			Discoveries
			Trade secret
			Goodwill

Source: Own compilation.

### **Intellectual and Industrial Property**

Telec (1994) defines intellectual property as a legal and economic abstraction that consists of a set of different objectively expressed ideal (i.e. intangible) objects that are neither things in our current legal framework nor rights as such, but as intangible property values are capable of being independent subjects of legal and economic relations. These intangible assets cannot be the subject of conveyance (sale, gift, deposit, inheritance or other transfer), but only the rights to them. That is why we are talking about intellectual property rights. These intangible objects originated either as a result of the intellectual creative activity of individuals, or as a result of non-creative activities of individuals or legal entities.

Smejkal (2010) notes that from an economic point of view, these intangible objects of intellectual property, or more precisely the rights to them, are money-valued goods having their exchange and utility value in the market. The theory and practice focuses in particular on the valuation of patents, utility models and industrial designs, trademarks, and trade secrets. Intangible assets (which are partly the result of research and development) that are professionally, materially and legally qualified to be eligible for (industrial) legal protection generally include (Kubíček and Svačina, 2006):

- Inventions
- Utility models

- Industrial designs
- Topography of semiconductor products
- New plant varieties and breeds of animals
- Trademarks
- Designation of origin of products
- Business name
- Improvement suggestions,
- Methods of prevention, medical diagnosis of diseases and treatment of people
- Computer programs (software)

### 1.3 Approaches to and Methods of Intangible Asset Valuation

Despite the high number of different valuation methods the approaches on which they are based are only three: comparison, cost and income approach.

#### I. Cost approach

This approach looks for the sum for which the same or similar asset might be obtained. These data are used for the calculation of the maximum price, for a rational buyer will never pay more than what they might need to pay for the same asset elsewhere. This approach is rarely used in practice (trademark registration application, purchase of intangible asset in the context of impartial competition with a sufficient number of participants). Some legislative regulations assume this approach. Cost approach to price calculation uses historic prices or historic prices reflected at the present time. In the case of technical solutions the result is not usually the market price. Cost methods include costs of acquisition, industrial legal protection, advertising and costs of sacrificed opportunities (Čada, 2007).

There are two cost-based methods (Reilly, 1999):

**Cost replacement method** – This method is based on creation of an accurate copy of the valued intangible asset and includes the wear level as of the valuation date reflecting reduced applicability of the asset. This procedure assumes used of the original inputs and procedures on the price level as of the assessment date.

$$V_{IA} = \sum_{i=1}^n \sum_{t=0}^T [C_i \times (1 + I_{CPI})^t \times (1 + i)^t] \times (1 - A) + GTD$$

$V_{IA}$  – The value of the intangible asset

$C_i$  – Cost item value incurred for development of the original intangible asset

$I_{cpi}$  – Cost item price change between the time when the costs were incurred (t) and the valuation date, measured by an appropriate price index (CPI)

i – Lost opportunity costs

A – Level of applicability reduction of the incurred costs (depreciations) as of the valuation date.

GTD – Gain from tax deductibility of the asset

t – Remaining life of the intangible asset

**Substitution cost method** – This method is based on creation of an intangible asset with a comparable applicability. This procedure assumes the use of new, more effective inputs and procedures available as of the valuation date, if any (Svačina, 2010).

## II. Income Approach

The value of an intangible asset in the income method can be theoretically defined as the difference between the value of the business using the given asset and the value of a business not using the same or a similar asset. Practical calculation of this difference is usually implemented on lower levels, always by comparison of two products – one containing and the other not containing the intangible asset in question (Kislingerová, 1999).

### Licence analogy method

This is the most widespread method of intangible asset valuation, especially used for intellectual property right valuation. The principles of this method are based on tradability of intellectual property rights by means of licensing agreements. The market value of intangible assets is derived from licensing trade analogy. It is mainly applied to intangible assets for which a number of comparable transactions are available. (Svačina, 2010)

Mathematical expression according to Svačina (2010):

$$H_{NA} = \sum_{t=1}^n \frac{T_t \times PM \times LP \times K_t \times (1 - d)}{(1 + i)^t} + TAB$$

$T_t$  – Sales volume plan of the product containing the intangible asset being valued (net sales)

PM – Share of the intangible asset in the sales volume of the product containing the intangible asset being valued

LP – Royalty rate

$K_t$  – Obsolescence index (this index helps to express the general dependence of the value of the engineering solutions on time.) The overall tendency of the value of engineering solutions has

a decreasing tendency over time. In order to determine the index it is necessary to estimate the length of the useful life of the solution being evaluated.)

i – Cost of missed opportunity

t – Remaining useful life of the intangible asset

d – Corporate tax rate

TAB - Benefit from the tax depreciation of the intangible asset

If the income approach is used, it is important to mention a non-market valuation method, namely **valuation of intangible assets pursuant to Act no. 151/1997 Coll.**

This type of valuation is, in practice, called profit capitalization, and is considered to be a simplified version of the income based approach compared to the discounted cash-flow method. This valuation method is considered universal and simple, but the determination of the market value of the intangible asset may be distorted. This is because it does not consider the nature of the intangible assets and their differences. However, we believe that the major problem is the administrative determination of the capitalization rate, which currently represents 12% for property rights. It is a question whether, given the components based on which the capitalization and discount rates should be determined, this value is justified, or rather in which manner it was determined. Mathematical expression of the method, pursuant to the law:

$$C_v = \frac{Z_j}{\left(1 + \frac{p}{100}\right)^j}$$

$C_v$  – Value of the property right determined using the income approach method

$Z_j$  – Net annual proceeds from the use of the right in the years in which it will be used, determined in accordance with the procedure set in Sec. 17(2) a) or b) of the Act

$p$  – Percentage capitalization rate for property rights set out in Annex 22 to the Implementing Decree

$J$  – Serial number of the year in which the right will be used

$n$  = Number of years for which the right will be used, but not more than the number of years under Sec. 17 (3) of the Act.

### III. Comparative Approach

According to Malý (2007) market methods calculate asset value by studying transactions with assets similar to the valued one. Transactions implemented on free and open market may substitute for asset price assessment. For these methods to be used the following conditions must be met:

- Existence of a market where intangible assets comparable to the valued one are traded



- Existence of a sufficient number of transactions implemented with these assets
- Possibility to obtain detailed information about these transactions.

What is compared: economic characteristics, technological properties, functional properties, branches of economy, economic conditions on the given market at the time of the compared transaction, existence of super-standard financial conditions of the transaction. This method requires a developed and liquid intangible asset market. In the Czech Republic this method may only be used on the theoretical level.

#### **Multiplier method** (Malý, 2007)

Mathematical expression of direct comparison:  $V_{IA} = \frac{P_c}{X_c} \times X_{EA}$

$P_c$  – The price of the comparable intangible asset

$X_c$  – Key economic characteristic of the comparable intangible asset (such as EBITDA, EBIT)

$X_{EA}$  – Equal economic characteristic of the valued intangible asset.

## **2 RESEARCH GOAL AND SAMPLE EXAMPLES**

The main objective of the paper is to provide a comprehensive overview of existing valuation methods for intangible assets and to identify their advantages and disadvantages. This paper contains sample examples for each approach for better understanding.

### **Example 1: Valuation of a new trademark using cost-based method**

A company ordered a trademark to be designed by an advertising agency, and paid CZK 70 thousand for its creation. The company paid another CZK 6 thousand for marketing services. The company asked the Industrial Property Office to have the trademark registered in the Register of Protective Designations, and the registration fee, together with the costs of a patent attorney, amounted to CZK 12 thousand.

In this case, it is possible to value the trademark using the cost-based method. Trademark costs incurred are as follows: cost of creation: CZK 70 thousand, marketing services: CZK 6 thousand, registration (+ related costs): CZK 12 thousand. Thus, the total costs are: CZK 88 thousand. It should be noted that the result will represent only the minimum value of the subject of the valuation.

Although it is a relatively simple calculation of the value of an intangible asset, its application is very limited. No cost-based method is able to arrive at the market value of an intangible asset. This approach implicitly assumes that the economic value of an intangible asset is related to the cost of its creation, but this is almost never the case in practice.

### **Example 2: Valuation of industrial design using license analogy method**



The subject of the valuation is an industrial design - engineering solution – the service life of which is estimated to be 5 years. Data on production volume are fictitious. The royalty for industrial designs typically ranges from 2% to 6%. In order to determine the obsolescence coefficient, it is necessary to estimate the useful life of the valued intangible assets. Engineering solutions always have a limited lifetime, because in the future they will definitely be overcome by different solutions. This aspect has to be taken into account and is expressed by the obsolescence coefficient.

The value of the obsolescence coefficient is also fictitious; it can be considered an average value. The capitalization coefficient was calculated using the ratio:  $1/(1+i)^t$  in accordance with Act no. 151/1997 Coll. on property valuation. The size of the share of the intangible assets is also illustrative. Table 2 shows a detailed calculation.

Table 2 An example for calculating the valuation of an industrial design using license analogy method

Year	Production volume RV (CZK)	Royalty of 4 % RV x LP (CZK)	Obsolescence coefficient KZ 8 %	RV x LP x KZ (CZK)	Capitalization coefficient KK 13 %	Share in production 20 % PM	Net annual value (CZK) RV x LP x KZ x KK x PM
2012	30 mil.	1 200 000	0,92	1 104 000	0.884	0.20	195 187
2013	32 mil.	1 280 000	0,84	1 075 200	0.783	0.20	168 376
2014	34 mil.	1 360 000	0,76	1 033 600	0.693	0.20	143 256
2015	36 mil.	1 440 000	0,68	979 200	0.613	0.20	120 050
2016	40 mil.	1 600 000	0,60	960 000	0.542	0.20	104 064
<b>Total</b>							<b>730 933</b>

Source: Own figures.

**Example 3: Valuation of an industrial design pursuant to Act no. 151/1997 Coll.**

The subject of the valuation is an industrial design - engineering solution – the service life of which is estimated to be 5 years. In the last year of the use of this right the production volume was CZK 40 million. The question is what percentage of the production volume is adequate to the specific case. An average rate of 1% of the total production volume will be used. In particular, in this case, the annual net proceeds from the use of the right in the years in which

the right will be used will be CZK 400,000. The capitalization rate for valuation of property rights is 12%.

$$C_v = \frac{400\,000}{(1 + 0,13)^1} + \frac{400\,000}{(1 + 0,13)^2} + \frac{400\,000}{(1 + 0,13)^3} + \frac{400\,000}{(1 + 0,13)^4} + \frac{400\,000}{(1 + 0,13)^5}$$

$$C_v = 353\,982,30 + 313\,258,67 + 277\,220,06 + 245\,327,49 + 217\,103,97$$

$$= 1\,406\,892,49 \text{ Kč}$$

Obviously, the result differs substantially from the result calculated by the license analogy method. The difference can be attributed to different input values. The problem is the very finding of these input values, which may be approached a little differently by each entity.

### 3 RESULTS AND DISCUSSION

In the previous chapters, valuation approaches used to measure intangibles are characterized and each approach is illustrated by an example. Each method has its scope of application, often as a support method. Table 3 lists the most significant advantages and disadvantages of individual approaches and methods.

Table 3 Advantages and disadvantages of individual approaches

Approach	Advantages	Disadvantages
<b>Cost-Based</b>	<ul style="list-style-type: none"> <li>▪ It is based on the principle of economic substitution</li> <li>▪ Simple calculation</li> <li>▪ It is appropriate in cases where the benefit from an intangible asset is not unambiguous</li> <li>▪ The value of an intangible asset will be reflected in the accounting records immediately after its creation</li> </ul>	<ul style="list-style-type: none"> <li>▪ These methods are unable to determine the market value of an intangible asset because there is no direct relationship between the value of the intangible asset and the cost that is necessary to create it</li> <li>▪ In the calculations, this approach does not take into account future returns that the intangible asset is capable of generating</li> <li>▪ The result does not reflect the potential benefit from the asset</li> <li>▪ It is difficult to determine the cost of "creating" an intangible asset because it is necessary to perform a detailed analysis of the subject of valuation (basic, technical parameters)</li> </ul>
<b>Income-Based</b>	<ul style="list-style-type: none"> <li>▪ It is based on the principle of economic expectation</li> <li>▪ Income approach methods are generally applicable to most types of intangible assets</li> <li>▪ The basic method of valuation of intellectual property rights, which are tradable in the form of license agreements</li> <li>▪ Relatively simple calculation</li> </ul>	<ul style="list-style-type: none"> <li>▪ The disadvantage of these methods is that they are based on assumptions of future development, which is always associated with a certain degree of risk</li> <li>▪ It is necessary to predict not only the future cash flow but also to estimate the discount rate</li> <li>▪ The non-market valuation method (pursuant to the law) is never able to quantify the market value of the asset</li> </ul>

	<ul style="list-style-type: none"> <li>▪ In most cases, the necessary data is available from the financial records of the companies</li> <li>▪ The related cash flow is predictable</li> </ul>	because it does not consider the nature of the intangible asset and their differences
<b>Comparative</b>	<ul style="list-style-type: none"> <li>▪ It is based on the principle of equilibrium</li> <li>▪ Relatively unambiguous valuation approach</li> <li>▪ It can be used for checking the results of other approaches</li> <li>▪ It can be applied to a wide range of intangible assets</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited market for intangible assets trading</li> <li>▪ A high level of market awareness is required</li> <li>▪ The necessary sources and information for the valuation are not publicly available, or not complete</li> <li>▪ The uniqueness of intangible assets complicates the comparison</li> </ul>

Source: Own compilation.

## CONCLUSION

Intangible assets are characterized by uniqueness; each asset needs a unique approach to valuation. Quantitative approaches express the value of intangible assets in monetary units. After compiling a detailed overview of Czech and foreign academic publications, it is clear that the above valuation approaches are not uniform. Each approach has been developed to meet certain requirements, and has a different view of the issue, but neither is universal.

The cost-based approach assumes that an intangible asset can be measured on the basis of the costs invested in it, converted to the present value, or as the sum of the costs that would have to be expensed to create the same or similar intangibles again. The problem with this method may be the weak link between the costs expensed, i.e. the value of the intangible asset, and its future benefits (whether in profit or loss). Another problem may be the fact that the value for the owner of the intangible asset may be much higher than the value calculated using past costs.

In practice, the income-based approach is the most widely used, especially in relation to industrial rights. It takes into consideration the future benefits that the intangible asset will bring us.

The comparative approach determines the value of an intangible asset by comparing the sales of the same or very closely related assets on the market. In practice, however, it is very difficult to find this information because it rarely happens that intangible assets are sold separately; usually the company is sold as a whole, including all intangible assets owned. Another problem is the finding of a comparable asset itself; most of the intangible property is

very specific, so if we can find a comparable business, it needs a lot of adjustments and "custom tailoring", which requires a great deal of skill and experience on the side of the appraiser.

The main characteristic of the valuation of intangible assets is the high degree of subjectivity reflected in individual methods in numerous valuation steps. There is no single procedure according to which we could proceed and come to a clear conclusion. The paper presents the characteristics of the basic valuation approaches of intangible assets and focuses on their advantages and disadvantages.

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