

Valuation of intellectual property

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In the article the problem of valuation of intellectual capital is discussed. Author examines the nature, common features, specific features of the different valuation approaches. The problems appraisers confront with during the process of valuation and the further researches are also reviewed in the article.

Keywords: intellectual capital, valuation of intellectual capital, intellectual resources, intangible assets, valuation approaches.

Пальчук О.І. ОЦІНКА ІНТЕЛЕКТУАЛЬНОЇ ВЛАСНОСТІ

В статті розглядається проблема оцінки об'єктів інтелектуальної власності. Проаналізовано сутність, спільні риси, особливості кожного з підходів до оцінки інтелектуальної власності. В роботі також окреслено проблеми з якими стикаються оцінювачі при визначенні вартості інтелектуального капіталу та визначено перспективи подальших досліджень.

Ключові слова: інтелектуальний капітал, оцінка інтелектуального капіталу, інтелектуальні ресурси, інновації, нематеріальні активи, підходи до оцінки.

Пальчук Е.И. ОЦЕНКА ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ

В статье рассматривается проблемы оценки объектов интеллектуальной собственности. Проанализированы сущность, общие черты, особенности каждого из подходов к оценке интеллектуальной собственности. В работе также очерчены проблемы с которыми сталкиваются оценщики при определении стоимости интеллектуального капитала и определены перспективы дальнейших исследований.

Ключевые слова: интеллектуальный капитал, оценка интеллектуального капитала, интеллектуальные ресурсы, нематериальные активы, подходы к оценке.

The intangible assets created through the processes of innovation represent a major share of the value of today's businesses. Despite their fundamental importance, the understanding of intellectual property and intellectual property rights does however differ widely amongst businesses large and small. The valuation of intellectual property assets is complicated by the fact that no two intellectual property assets are the same. Numerous valuation standards, articles and publications have been issued during the last years concerning different intellectual property rights with different geographical scope and different regulation approach. The bottleneck for the improvement of intellectual property market is not in the lack of accepted methods or standards, their content or consistency, but in the limited dissemination of the fact that they exist and the little confidence in their results.

Last researches in intellectual property was made by P. Druker, T. Stuart, F. Fukuyama, A. Galchinsky, S. Sidenko, A. Chukhno etc. But as it was mentioned above many aspects of intellectual property remain disputable and insufficiently studied.

The purpose of the article is introducing the basic approaches that are currently used to deal with the difficult question of the intellectual property valuation.

In the twenty first century mankind made a transition from a matter – based economy to one based on ideas, from an emphasis on natural resources to thought, design, and organization. Lately, the intangible component has grown rapidly. The ratio of market to book value of world biggest companies doubles between 1973 and 1993, even before the run up in share prices in the second half of the 1990s. One of the world's biggest companies, Microsoft, has most of its value in "knowledge capital", embedded in its personnel, its organization, patents, copyrights, brand value, and so on.

In modern economics the question of classifying and measuring intangible assets remains an important unfinished issue in finance and economics theory and in the practice of management.

Intellectual property plays a very important role in the modern economy and its significance is growing. For most companies in developed countries more than 75% of their value is directly linked to intellectual property and intangible

Table 1

Fortune Global 500 list of year 2016 [4].

Rank	Company	Country	Industry	Revenue in USD
1	Walmart	United States	Retail	\$482.1 billion
2	State Grid	China	Power	\$329.6 billion
3	China National Petroleum	China	Petroleum	\$299.3 billion
4	Sinopec Group	China	Petroleum	\$294.3 billion
5	Royal Dutch Shell	Netherlanand United Kingdom	Petroleum	\$272.2 billion
6	Exxon Mobil	United States	Petroleum	\$246.2 billion
7	Volkswagen	Germany	Automobiles	\$236.6 billion
8	Toyota Motor	Japan	Automobiles	\$236.59 billion
9	Apple	United States	Technology	\$233.7 billion
10	BP	United Kingdom	Petroleum	\$225.98 billion

assets". Even the value of intellectual property for the largest companies in the Fortune Global 500 [1]. ranges between 45% – 75% and also represents the highest growth area in the global economy [2]. An analysis of the fortune 500 companies showed that, in 1975, 60 per cent of their market capitalization was represented by tangible assets but, twenty years later, tangible assets percentage was only 25%. The trend has continues since 1995 [3]. Top10 of the Fortune Global 500 list of year 2016 represented below in the table 1. The rankings, which have been released by the magazine at its website, appear in the July 20, 2016, issue of the magazine. The following is the list of top 10 companies, as published on July 20, 2016. It is based on the companies' fiscal year ended on or before March 31, 2016 (table 1).

To understand better the power of different countries in the global economy it is important to represent the list of the top 10 countries with the most Global 500 companies (table 2).

Table 2

The list of the top 10 countries with the most Global 500 companies.

Rank	Country	Companies
1	USA	134
2	China	103
3	Japan	52
4	France	29
5	Germany	28
6	United Kingdom	26
7	South Korea	15
7	Switzerland	15
9	Netherlands	12
10	Canada	11

Intangible assets include assembled trained workforce, designs, customer lists, accounting

and operations related records, supplier/distributor relationships, contracts, and intellectual property. The other two major classes of assets are monetary assets and tangible assets (real estate, equipment, buildings, etc.).

Despite the significant importance of intellectual property, valuation of intellectual property, and valuation of intangible assets, generally, is still an emerging field.

Unfortunately it's no use in book value. The book value of a company is determined by looking at a company's balance sheet, and equals the value of the assets over the company's liabilities. The market value of a company is calculated by the market price of the publicly traded stock, times the total number of shares issued. Book value of the company often does not account for the value of intangible assets, such as goodwill and brand equity, that are not reflected on the balance sheet. It's also skewed for companies with few tangible assets, such as technology and software corporations.

Different organizations try to develop standards for valuation of intellectual property and other intangible assets. In fact, the Cabinet of Ministry of Ukraine adopted the National Standard 4 "Valuation of property rights of intellectual property" only in 2007. It has been cited as the only public valuation standard that takes into account the unique aspects of different forms of intellectual property (patents, copyrights, trade secrets, and trademarks) in providing valuation standards.

Besides the important issue of stock market valuation, there are several principal business circumstances in which intangible value needs to be measured.

- A company sale, merger, or acquisition. The acquiring company will appropriate the physical assets or the purchased firm, but what

is the injection of new knowledge worth? Usually accounting measures do not coincide with economic or market-based values. Many mergers and acquisitions are justified on the grounds of combinatorial synergy between the knowledge base of the two companies. However, there could also be combinatorial incompatibilities, knowledge transfer costs over many years and cultural compatibility problems between the merging organizations.

- Sale, purchase, or licensing of separable assets such as brand, patents, copyrights, data bases, or technology. "Separable assets" are those that can be detached from the company that possesses them and transferred, sold, or licensed to another firm. This could include any transferable knowledge, codified or teachable, and rights to intellectual property or markets. Here, only a portion of the intangible assets of a company are spun off to another firm, by a legal transfer agreement and/or by training the other firm in the use of the transferred knowledge. But how much should the company licensing or acquiring these assets pay?

- Lawsuits involving intellectual property infringement. Here courts need to determine infringement costs and penalties.

- Tax liability calculations in the context of transfer of intangible assets and technology to affiliated firms, possibly in another nations.

- Corporate alliances. During negotiations over the formation of a joint venture or the many other forms of strategic alliances such as management service contracts, franchising etc the valuation of the knowledge knowledge contributions of each partner is a key issue.

- Research and Development (R&D) management. Putting a value on prospective future knowledge generated by R&D investments is key to selecting between competing R&D projects. Other crucial measurement area is valuating each partner's contribution in co-development projects.

Valuation of intellectual property is increasingly important to business success. For example, as intellectual property is a key component of business value, accuracy in valuation of intellectual property will increasingly be a success indicator for businesses transactions (e.g., acquisitions, sales, licensing transactions, etc.).

"Value" is generally defined as the "present value of future benefits to be derived by the owner of property." As such, "valuation needs to quantify the future benefits and then [use such future benefits to] calculate a present value."

There are three major methods for valuation of intellectual property – the cost approach, the income approach, and the market (or transactional) approach. Each of them is discussed in detail below.

Appropriate selection of an intellectual property valuation method depends on factors that are set forth in the "valuation pyramid" described by Flignor (e.g., business, legal, and financial context) and other factors discussed belows [5].

The cost based approach is based upon on the principle of substitution, i.e., value of an asset is estimated on the basis of cost to construct a similar asset at current prices. The assumption underlying this approach is that the cost to purchase or develop new property is commensurate with economic value of the service that the property can provide during life [6].

It considers the cost of the inputs spent on making particular intellectual property is equivalent to the value derived from the same. If the creation is not useful then also it has value because certain amount of inputs had been spent on it which carries value.

The replacement cost of an Intellectual property asset is the cost to develop similar functionality to the subject Intellectual property outside the scope of the legal protection. A common usage of the replacement cost method is the cost to "design around" a patent or set of patents. This method is based on the principle of substitution – an investor would not pay more for an asset than the cost to obtain similar benefits from another asset. This method is particularly useful when the legal protection is weak or the technology is relatively well-known, and the Intellectual property does not produce income currently.

Limitations for cost based approach:

1. Under this method the value of intellectual property is not the real value, as it does not directly consider the amount of the economic benefits that cannot be achieved nor the time period over which they might continue.

2. It is difficult to determine all historical development costs.

3. This approach consider cost equivalent to value which cannot be true.

4. This approach doesn't consider risk involved in future.

In view of these limitations, the cost approach is primarily used when:

- it is not feasible to project earnings for the intellectual property
- the intellectual property is not the type of asset that can be readily transferred to a third

party separate from the organization in which it currently resides

- the IP is developed for “in-house’ use and not for resale.

In the income approach assets are valued based on what they will earn in the future. This requires estimates of future cash flows (both inflows and outflows) in terms of both amount and timing; economic life; and risk-adjusted discount rate that reflects the required return. The approach thus considers factors such as gross & net revenues; gross profits; net operating income; pretax income; net income; and cost savings, etc.

Projected cash flows are the future income attributable to the intangible asset. It is important that the analysis should capture all direct and indirect costs associated with the IP in question, including lost sales of bundled products or services, incremental overhead costs, necessary investment and the likely effects of competition on the price premium or costs savings derived from the asset. The economic life refers to the length of time that the Intellectual property will be able to command the price or cost premium. The economic life is generally bounded by the legal life of the asset but is often much shorter. For instance, it is common in the electronics field for the technology to become obsolete in as little as 3 years, often well before the patent expires. The discount rate refers to the expected cost of financing the asset in question.

The income method, while highly analytic, is also quite subjective. Subjectivity is employed throughout the methodology, with particular care required to assess all the business and financial dynamics that impact the expected incremental cash flows. The use of a terminal value, which captures value beyond the years, can often represent a significant percentage of the total asset value. The income method has been well analyzed and published, with texts and software readily available. While care is required for all valuation methods, the subjectivity involved in the income method can be especially tricky.

Limitations for income method: it is very difficult to estimate income attributable to intangibles, its economic life, appropriate discount rate/cost of capital and discount rate.

Under the market based approach (transactional approach) of the value of intellectual property can determine by considering the market prices paid for similar properties as a part of third party transactions. The approach estimates the value of an intangible asset based on market prices of comparable intangible assets that

have been bought / sold or licensed between independent parties. In other words, it provides indications of value by studying transactions of property similar to the property for which a value conclusion is sought.

The transactional approach is appealing because it is a direct measure of the value of the intangible asset. As such, it is often considered to be the most reliable of methods when it can be performed credibly. As a general rule transaction data can never be ignored in a valuation exercise – it either must be incorporated or affirmatively rejected as part of the analysis [7].

Typically, there are two steps to a transactional method valuation – screening and adjustments. Screening refers to the selection process of identifying candidate third party transactions with sufficient information on pricing, scope and terms and conditions to be deemed comparable to the intangible asset in question. Adjustments refer to an explicit quantifiable change in the valuation due a specific rationale. Adjustments are typically grounded in a baseline transaction (or transactions) that are sufficiently close to the subject intangible asset, and for which sufficient information is available to analyze the technical, legal, business and financial terms.

Bottom line – for the market based approach to be effective there must be relevant information about the market available. This is very often not the case in respect of intellectual property transactions.

For intellectual property it is often difficult to implement the market based approach because information about third party transaction involving similar property is scarce. The following are the requirements for valuation of intellectual property.

Factors for selection of the appropriate method to use are discussed above. For example, use of a market approach is preferred if there is sufficient market information. If not, the income approach is typically preferred. A cost approach is usually applied only in certain situations as described above.

The selection of valuation method also can vary with respect to the type of intellectual property to be valued, as shown in the following graphic 1.

Similarly, valuation may vary with the particular transaction/business situation in which the valuation is being performed.

The value of an intangible asset is subjective. However, it plays an extremely significant role in assessing the value of a start-up, especially because these companies do not possess much

sales, revenue or other tangible assets [8]. In such circumstances, intellectual property valuation experts need to perform extensive due-diligence and understand the core technology disclosed in a patent vis-à-vis the market trend. For early-stage products the risk is high as there is very less information available regarding the viability of the product.

For examples, when it comes to putting up a social value to their industry status, Facebook and Twitter are quite the dramatists.

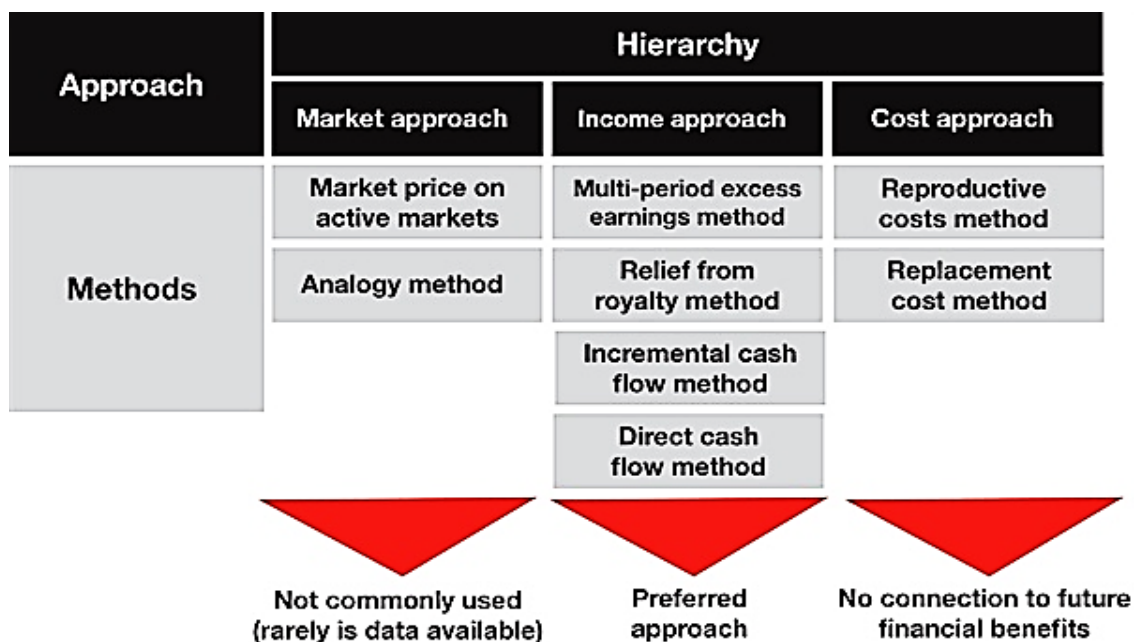
Following its acquisition of Instagram for \$521 million in August 2012, Facebook increase the value of its intangible assets. As of December 2013, the company had 1858 issued patents and 2501 filed patent applications in the United States, and 494 corresponding filings in other countries. Most of these patents are related to social networking, web technologies and infrastructure, and related technologies. With most of its issued patents, Facebook today values itself at \$202.09 billion [9].

Twitter has an intellectual property asset of 956 issued patents. Most of its patented technol-

ogy lies in message distribution, graphical user interfaces, security and related technologies. With a majority of Twitter’s patents also due to expire between 2016 and 2031, the company now values its enterprise at \$22.9 billion.

With IP valuations dropping, the task to assign fair values to intellectual property is going to become a more daunting task for companies and valuers. The bigger a portfolio, the greater will be the time and effort spent to assign a monetary figure to it – an absolute challenging time ahead for intellectual property valuers [10].

Summary. The topic of intellectual property valuation can (and does) fill books. The selection of which approach to use and how it should be specifically applied depends on numerous factors including the kind of IP at issue, the context in which the valuation is made (e.g., valuation in patent litigation is much different than valuation of intellectual property in the context of M&A work). This short article is merely intended to introduce the basic approaches that are currently used to deal with the difficult question – what is the intellectual property worth?



Graphic 1. Three valuation approaches as they apply to intellectual property assets.

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