METHODS FOR ECONOMIC AND FINANCIAL ANALYSIS OF INTANGIBLE ASSETS

Associate Professor Gabriel I. NĂSTASE
Director Department of University Studies
Masters–Christian University "Dimitrie Cantemir"
Member of the Academy of Scientists from Romania (AOŞR)
gabriel_i_nastase@yahoo.com

Abstract:
Intellectual property is intangible property stemming from human creation. This together with material goods (as goods acquired by the company), and natural resources used or usable in the production of materials, forms part of the national wealth. Referred to as intellectual property rights are also rights relating to intellectual creation and its results, the most varied forms.

Keywords: *research, development, innovation, intellectual property, intangible*

JEL Classification: M 21, M41

GENERAL FRAMEWORK

In a market economy based on free competition, intellectual property established markets, dominate industries, ensure international security, etc. generate profits., representing the greatest asset of a company.

Intellectual property is intangible property stemming from human creation. This together with material goods (as goods acquired by the company), and natural resources used or usable in the production of materials, forms part of the national wealth. Referred to as intellectual property rights are also rights relating to intellectual creation and its results, the most varied forms.

Intellectual property right is exclusive, private, to be recognized and protected by laws and legislative instruments under a state constitution. In Art. 41 of the Romanian Constitution stipulates that "ownership is guaranteed, private property is protected, regardless of ownership." Romania's participation in the international flow of values has long been subject to the existence of a national framework of intellectual property protection.

With the advent, in March 1996, Law no. 8 on Copyright and Related Rights, the legal framework for intellectual property protection in Romania was completed. Currently, the Romanian citizens have the opportunity to protect intellectual property by modern legislation, relevant current conditions of market economy. Under this legislation objects of intellectual property holders have exclusive and absolute rights, intellectual property rights are enforceable in court and can be measured economically by the effects they generate business.

Summary of intellectual property rights is to prohibit exploitation by any third party without authorization holders.

From a business point of view it is clear that intellectual property must be continuously monitored economic value because they cause the creation and maintenance expenses, and operation can generate income. Intellectual property by the amount they can make a substantial contribution to capital. Estimated profit and result of these rights may come from influences on the growth of revenue or decrease costs, such as: increasing sales, getting a higher price, gain markets, a dominant position or monopolistic market, maintaining a large number customers, providing a source of future business and generate additional business and further development of new products and new markets, lower labor costs, reduce material consumption, reduced utility consumption, lower recruitment costs and skilled labor, eliminate the initial costs for products and technologies,

design and development cost avoidance (when buying licenses), providing cheap and reliable funding sources, etc.. In short we can say that intellectual property contributes to:

- Profit company;
- Corresponding rates of return on investment;
- Economic contributions derived from the assets side of the business.

Each manager must be advised of the importance of identifying, assessing and protecting intellectual property in its own company for the operation to make maximum profits.

A practical self on these issues can be achieved by correct answers to the following questions:

- Intellectual property firm is identified at this time?
- Intellectual property is so important to the firm and how can help achieve its strategic objectives?
- There are gaps in terms of corporate intellectual property or technology failures and how they are compensated?
- Cost of generation and maintenance of intellectual property are accompanied by economic and strategic profits?
- Which is the strategy of protecting intellectual property in business?
- Company has a licensing strategy?
- The competitors have intellectual property and how they use their own goals?

In any company can identify an active intellectual property and intellectual property passive.

Active intellectual property generates most of the profits, act directly on production costs or introduce features that justify a high price. Reducing production costs is an area where intellectual property can lead to improved earnings. There are many ways in which intellectual property can control production costs, including:

- Reduced consumption of raw materials;
- Replacing other materials with cheaper, without compromising product quality and performance:
- Increasing the number of products produced per unit time;
- Improving product quality, which lowers the number of scrap;
- Improving the quality of production, which will reduce sewage and finished products rejected for quality control;
- Reduce electricity consumption and utility;
- Improving processes, the impact on aging equipment, thus reducing maintenance costs and repair times;
- Eliminating production steps and equipment used in the previous production process.

Passive intellectual property has no influence on production costs, the action is more subtle gains. Production and operating synergies may lead to higher profits. If large quantities of products are produced, they give synergistic benefits society, which ultimately translates into increased profits. Some of the typical synergies associated with a high production volume, are listed as follows:

- Raw materials can be purchased in large quantities which usually means price reductions. Suppliers offer price discounts to customers who make big orders. Economy resulting from the purchase of raw materials:
- Can achieve efficiency at every stage of production;
- Sales costs can be more easily controlled if there is a smaller number of sales agents, which carries a significant amount;
- Can make special arrangements with distributors;
- Costs related to compliance regulations can be dispersed over a larger quantity of products, as well as other fixed costs;

- Companies that carry a high volume production to ensure companies are able to pay utilities supplies, which can be obtained with discounts.

All synergistic benefits are helping to increase profits, if only through intellectual properties, leading to a dominant market position, especially trademarks and distribution network. In the intellectual property of a business liability can be taken into consideration all existing documentation and the book existing in the company, which does not participate in achieving production schedules.

In the past 10 years has seen a growth in recognition of intellectual property business. Intellectual property value is ultimately what people are willing to pay for it. Complex primary method of valuing a company introduces the total addition amount of material injury and the corresponding value of intangible assets in their expression or accounting - intangible, in which intellectual property is included. In industrial or commercial environment, can be identified over 100 intangible assets, which may be mentioned:

- Technical competence (documentation, studies, licenses, patents. Know-how), other object of industrial property, copyright, software, libraries, databases;
- Quality assurance system, staff qualifications, etc..;
- Commercial power (promotion, advertising, ford commercial, distribution networks etc.).
- Power management (quality, key managers, performance management etc.).
- Reputation (business reputation);
- Location;
- Customers;
- Creditworthiness and solvency to customers and banks;
-Stand on public and administrative bodies.

Practical assessment of the intangible assets is a complex and difficult. Multitude of factors that influence varies from one country to another, from one continent to another. Responsibility of carrying out transactions with these intangible assets, particularly intellectual property, is maximal because in many cases resulting social and political implications. The national policy support and activation of processes of innovation and technology transfer of research results, technology transfer (domestic and international) occupies an important place in the national economy. Conceptually, technology transfer refers to the transition of research results, which creates the source, the recipients do not have and can not create, but can apply and develop. In principle, evaluation of activities of domestic or international transfer of technology must go from firm diagnosis, in order to obtain an overview of its economic and financial situation. Thereby obtain a diagnosis component synthesis (production, quality, competition, turnover, financial situation, personnel). In this respect, the assessment a number of models able to base solutions on restructuring actions and strategic plans to guide research units - Development towards a market economy.

In Romanian and international theory and practice are used to calculate the economic efficiency and international transfer of technology, different models of Global Diagnostic; SWOT (Strenghts weaknesses, Opportunities and Hreats) Rolland Berger, AG. (Alexander Gheorghiu) CEMATT (Center for Management and Technology Transfer), BCR, Histogram, Method scores (scoring). Each of these methods has its specific and assigned a score for assessing economic and financial activities of the company.

Diagnosis Analysis of many models, some of them are not applicable to Romania (eg scores method). I think the most representative models and diagnostic analysis CEMATT overall diagnosis.

CEMATT Diagnostic Analysis model is designed as a tool of multicriteria diacnoses “check a company”. Structure type model is heuristic, because it refers to a search procedure of

unknown targets (evaluation "analyzed state enterprise"), based on its incremental operation, making a series of ascending steps, using a number of known criteria.

Comprehensive diagnostic analysis of a firm fixed strengths and weaknesses of its activity allowing the final assessment and calculation of economic efficiency of technology transfer (and international).

Construction of overall diagnosis involves determining the criteria designed to highlight the company in its complexity. In this regard note the following criteria by which we can guide you in compiling a comprehensive diagnosis:

• undertaking functions in connection with leadership attributes;
• structuralist definition of the enterprise concept, the criterion of 5 M;
• other criteria.

The national economy, the economic effects of introducing technical progress include the economic effects of applying the results of scientific research (CS) and Technology Development (TD) and the import of new technique. Uniform methodology for determining and analyzing the economic efficiency and social research (CS) and technology development (TD) and the introduction of technical progress (IPT), the authors have shown through mathematical formulas, methods for determining the economic efforts to implement the CS results and DT, and economic effects as a consequence of the results of CS and DT. For example, the valuation of patents requires a number of situations of interest to individuals and legal persons (Figure 1). Accounting Law no. 82/1991 established as customary in the balance sheets of registered traders appearing and intangible, and Law. Government Ordinance No. 15/1994 and. 54/1997, specify how the depreciation of fixed capital in tangible and intangible. In these circumstances, to establish a concrete value of patents and depreciation allowances, their evaluation is needed. Evaluation of a patent requires going through the following sequence:

A. Clarification of working principles

• assessment concerns only patented inventions (protected by title protection so);

This is in accordance with the law (Accounting Act no. 82/1991), which provides for balance sheet assets of Intellectual Property Rights (category are listed patents). Unpatented inventions can be considered:

- Be part of technological know-how, inventions unpublished applied in production;
- Be part of the research & development, inventions still not implemented in production. These are specific measures to protect privacy.

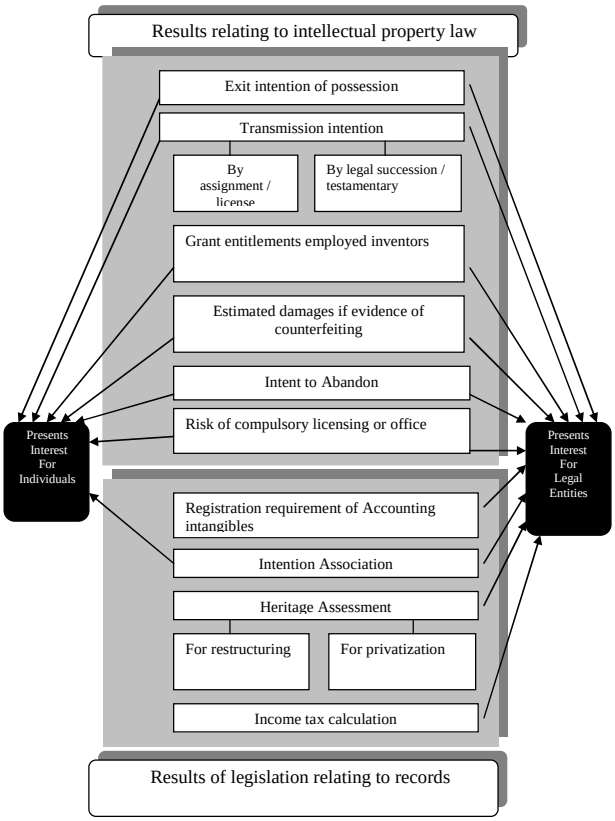

Figure 1. Situations requiring assessment of patent

• The final result is expressed quantitatively assess the value units (RON, Euro, USD etc.).. Not allowed qualitative assessment such as "X is the score eight patent" or "Y is valuable patent in 70%";
• outcome reflects the value the patent at some point in the concrete conditions of an operating business units and in relation to assessment;
• outcome is not the market value of the patent, but a starting value of negotiations. May have influenced the final amount due to the demand / supply market, the ability and interest of negotiators, etc..;
• margin approximating the final result depends on the specific case of each patent:
- Patented invention applied in production
- Patented invention being implemented in production (preparation phase of construction)
- Patented invention not applied in production.
Obviously as the degree of realizing in practice the invention increases the accuracy increases and the final outcome of the evaluation.
• both the assessor and beneficiary assessment agree to preserve the confidentiality of the results;
• both the evaluator and the recipient agree to use outcome assessment only for the purpose stated in the idea that assessment was undertaken;
• all patent information needed to calculate the amount and provided the holder is deemed accurate and in good faith.

B. Analysis of Diagnostic Patent
Diagnostic analysis of patents and prior assessment itself is carried out legally:
- Legal diagnostic analysis includes checking the legal aspects of laws, such as:

- Legal status of patent (life, any transfer / licensing, fees paid to date to maintain in force);
- Legal status of inventors and holders of their reports;
- Any outstanding payments due to application of the invention;
- Possible infringement lawsuits.

- Technical. Technical analysis refers primarily to:
• implemented inventions in production:
- Field of application
- Consumption of raw materials necessary
- Capacity production of proprietary object or proprietary method
• unimplemented inventions in production:
- Required investments (machinery, human resources and energy, etc.)
- Trade and Commercial Analysis deals:
- Domestic and foreign competition, represented father patents with similar themes;
- The degree of implementation in the production of competing patents;
- Any survey of public opinion regarding the products / methods in the field of the invention was made;
- Potential market segment interested in apply-ing industrial invention;
- Strategy patent holder in the short / medium / long on invention, including estimates of revenue.
- Office. The analysis is aimed at social issues as:
- Size and specialization of labor required;
- Ways of organizing and conducting the necessary staff.

C. Calculation of the recommended methods

Legislation and literature recommended several methods and computational techniques.

D. The provisions of current legislation in industrial property

Inventors have to determine the entitlements due under contract. Less used but still in force, is the methodology of calculation of such rights under Regulation implementing Law no. 64/1991 rule 53 para. 2. According to the Regulation of Law Enforcement nr.64/1994, Rule 53, para. 2:

> When negotiating entitlements in art. 66 para. 2 of the Act, will be used:
> a) after calculating the annual economic benefits from applying the invention, the unit prepared to apply the invention.
> b) If the calculation is made after the entry into force of this Regulation applied invention unit, has an obligation to call the inventor to prepare

It requires a few words:
- After estimation method relates solely to inventions already applied economics;
- Method is an algorithm for calculating the liabilities of the invention, receiver unit assigns its invention. Payment obligations include:
- Annual awards for 5 consecutive years of application;
- The share of annual savings postcal-lation, the first 2 years of implementation;
- Cash equivalent of legal rights resulting from authorship (salaries, etc..) Updated by indexing and amended with various additions.

Usually, however, the amount of entitlements granted to inventors residing in terms of the contract between the inventor and the company receiving the invention.

Moreover, the overall value of a patent, but can not be strictly equated with the amount of liabilities by the inventor losing. The amount of global patents is moving to accounting methods and valuation techniques, presented below.

E. Provisions of the literature

Traditional methods of valuing assets (assets) may be intangible:
a) Methods based on market comparisons
b) Methods based on estimated income
c) cost-based methods
It requires the following considerations:
- To recommend simultaneous use of these three methods. Establishing a credible values is possible only through comparative analysis of partial values that result from applying each method;
- A logical approach recommended by the three methods of evaluation, according to the specific asset evaluated.
For patents, the sequence of methods (overall), after preferences, is income / market / cost. Furthermore, preferences in adopting one of the methods for assessing intellectual property objects are presented schematically in table nr. 1.

Table 1. Methods for assessing items

Type	In method preference (overall)		
	Recom-mendation	Secon-dary	Low
Patents	Income	Market	Cost
Trade brands, services	Income	Market	Cost
For management Programs Computing	Income	Market	Cost
For Product cost	Income	Market	Cost
Copyrights	Income	Market	Cost

Note that often is made to assess (the situation which forced assessment) can move from one pole of interest to other methods.

Thus, the valuation of assets of a company, costing it is assumed that its component assets, so preference goes to a method based on cost. When assessing for privatization, matter-bility capable company and its resources, so preference goes to a method based on income. Since the input data and method, differentiated from one method to another, it is possible to obtain results (values) different. In this case, it is recommended mediation with different weights of intermediate values, a formula like:

$$V_{calc} = f_1 \times V_{cost} + f_2 \times V_{venit} < sau > V_{pia]\backslash} \quad (1)$$

where: f1 + f2 = 1

F. Cost-based method

Method based on the value of an item estimated intangible costs (intangible asset) on the principle of substitution. Thus, a prudent investor would not pay for an intangible or incorporeal more than the cost of replacing it with another comparable.
Replacement cost is the cost to create (at current prices) an intangible that has the same utility as those using modern production methods with modern designs to current standards and

qualifications current.
Replacement value is determined:
• updating and amortization of purchase price (if purchased with a patent a given price at a time). Purchase price history is updated with over integer coefficients calculated based on information provided by the National Commission for Statistics, Statistical Bulletin of prices, they reflect price trends in the economy. Prices updated subunit is corrected by a factor correlated with the remaining life, giving a present value remaining. Note that the remaining life of the patent depends on both the time remaining until expiry and renewals pace of technical and technological field of use patent.
• updating and amortization of all costs associated historical patents (in the case of a patent the company obtained dinpropria activity). Costs related to patent relates to historical research, prototype, preparation of construction, launching the manufacturing, etc. approval. Significance and damping coefficients update remains the same.

G. Method based on income

Income-based method, is to determine the economic net income, which can be obtained, with credibility, the use of intangible asset, such income is:
- Be the nature of cash-flow achievable during the remaining economic life of the intangible asset;
- Be the nature of profit;
- Be the nature of net fees.

Patent value is determined:
• updated by adding net profit profit on the remaining life (in patents whose eploatare not require additional expenditure);
• updating of gross cash flow during the remaining life (in patents whose exploitation requires additional costs).
In these cases, the remaining life has the same meaning, while the exploitation of the invention that can benefit, that period may not coincide with the remainder of legal protection.

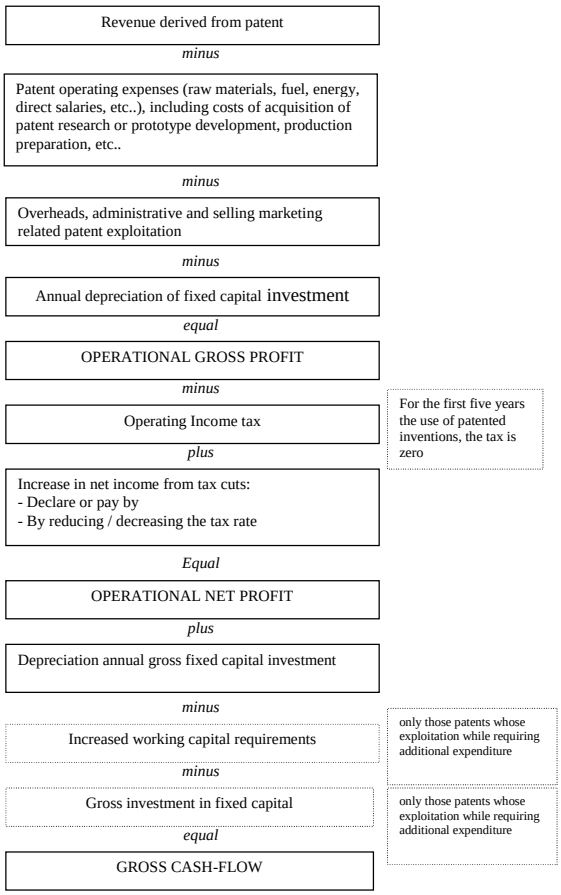

Figure 2. Market comparison method H.

The additional costs relate, in this case, the fixed capital investments and increasing working capital requirements. Subsequently, the net profit (or gross cash-flow) is update and totals for those years that is not the remaining life. In this case, the upgrade reflects the process by which the amount will be in future income is brought to present value by multiplying the discount factor. Discount factor for the year and the remaining life of n years, is of the form:

$$F_{(a)} \sum \frac{1}{(1+t)^{i}} \qquad (2)$$

where t = discount rate = 18 ... 25%

The discount rate is determined by comparison with the effectiveness of risk-free investment (government bonds). Therefore, the update factor subunit, the smaller the more distant and future income is greater, the higher the overall investment risk is lower.

Schematic model for determining the cash flow is shown in figure 2.

Method based on market comparisons, is to compare the market value (fair market value) of the same kind of intangible assets similar or comparable, and which were subject to normal market transactions. Using this method is limited by lack of information necessary to ensure comparability.

REFERENCES

1. Nastase, I., G., *Insurance law of industrial property rights of inventors,* QUALITY magazine, year X, no. 1-2, January-February 2009, p. 67
2. Nastase, I., G. *Implications of research, technological development and innovation in security system,* PhD Thesis, Ministry of National Defense, National Defense University, War College, Bucharest, 2008
3. Nastase, I., G., *Financial Management of the Company. Methods of analysis, evaluation and calculation of financial and economic efficiency of intangible fixed assets. Case Studies - The patent* PROUNIVERSITARIA Publishing, Bucharest 2010
4. Nastase, I., G. Lepadatu, G., *Interdependence of economic and technological environment,* journal QUALITY, year X, no. 6, June 2009, p. 40-45
5. Nastase, I., G., D. Nastase ,G, I, D, *Scientific research and technological development- factors of progress,* Journal INOBAROMETRU year I, no. 2, October 2009, p. 5
6. Nastase, I., G., *Economic and Financial Crisis in Romania in our Globalized World, Causes, Effects and Solution* METALURGIA INTERNATIONAL Magazine, vol XV (2010), no. 3, p. 111-113 3, p. 111-113
7. Nastase, I., G., Badea, C., D., NĂSTASE , G., I. D., *General Concepts of Political Science,* METALURGIA INTERNATIONAL Magazine, Vol V (2010), no. 1, p. 195-200 1, p. 195-200
8. NĂSTASE, I., G., BADEA, C., D., NĂSTASE, G., I., D., *Innovative models of development through science,* COGITTO Magazine, no. II, March 2010, vol II, Ed PROUNIVERSITARIA, Bucharest, 2010, p. 106-135
9. Nastase, I., G., Badea, C, D, System Problems, Research and Development and Innovation (RDI) of Romania, EUROMENTOR Magazine, Vol I, March 2010, p. 29-30