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**EVALUATION OF INTELLECTUAL PROPERTY AND INTANGIBLE ASSETS**

**Working paper for discussion**

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The purpose of the present paper is to provide a succinct but fairly full description of the current status of theory and practice in the valuation of intellectual (intangible) capital, including econometric research, the professional valuation of intellectual property and intangible assets, as well as new approaches to the valuation of knowledge-based business.

**1. Basic concepts, aims and types of valuation**

The concept of “intellectual capital” (IC) is used essentially by managers in the administration of personnel and intangible assets, in creating a favourable image of the company with the aim of attracting investment, and in valuing a knowledge-based business with a view to sale or purchase. It is broader than the more usual concepts of “intellectual property” (IP) and “intangible assets” (IA). At the same time, it is close in meaning to the concept of “intangible capital” used in work on econometrics at least since 1990. The most important concepts used in this paper also include “institution”, understood as the totality of legal norms, rules and standard forms of behaviour, and “transaction”, understood as the basic element of microeconomic analysis.

## **1.1. Valuation of a knowledge-based business and of intellectual capital**

### **1.1.1. Econometric valuation of intangible (intellectual) capital**

In the classic work of Griliches<sup>1</sup> on the use of patent statistics in economic measurements, intangible capital is the natural non-observable variable which raises the market value of a company and which depends on the quantity of the patents it holds, the volume of investment in research and development<sup>2</sup> and other similar factors. Associated with the presence of intangible capital in a company is the raising of its market value above the replacement value of tangible assets, taking into account the “going concern” factor. This last stipulation is important. In the professional valuation of a business, the “going concern” factor is customarily taken into account and linked with the asset of the same name. This asset is related to the number of intangible unidentified<sup>3</sup> assets. Its value is determined as an addition to the replacement value of the tangible assets, calculated using a standard scale for each type of business. The work cited refers to the raising of the market value of a company above the replacement value of its tangible assets by taking this addition into account, i.e. one of the intangible assets (the going concern) is not included as a component of intangible capital.

Of interest for research, as also for the business, is the dependence of the calculation value obtained on observable indicators, including investment in research and development and the number of patents obtained. Econometric research (Griliches Z. 1990) has shown that for large public corporations there is a practically linear relationship between investment in research and development, the number of patents obtained and the rise in the value of intangible capital. It should be noted that in this context the value of intangible capital was obtained as the difference between the market capitalization<sup>4</sup> and the replacement value of the tangible assets taking into account the “going concern” factor, i.e. the market capitalization of a company (the product of the share price and the number of shares) was taken as its market value. Such a substitution is in practice unavoidable, since large public corporations are almost never sold as one unit. Accordingly, the standard definition of market value as the most probable price has no meaning in the case of such corporations. At the same time, it is easy to calculate the market capitalization of a public corporation on the basis of data from open sources, and this is very convenient for researchers. However, it is precisely for public corporations that the existence of such a relationship is of more theoretical than practical value.

The established dependences could be of practical value only in cases where, when a company is bought or sold, difficulties arise in defining its market value using standard methods (Pratt S. 1989) which are based on comparable sales analysis or cash flow discounting. In such cases the possibility of assessing the value of intangible capital on the basis of patent statistics could offer a fully acceptable way out of the situation. The company’s market value could be calculated as the sum of the replacement value of the tangible assets, the value of the going concern (defined using the table) and the value of the intangible assets. However, in practice this possibility is not available.

It was possible to establish the existence of a linear relationship between the volume of investment in research and development and the number of patents obtained only for large companies which possess thousands or tens of thousands of patents. For small and medium-sized companies such a simple relationship does not exist. Indeed, currently such a

dependence probably does not exist for large companies either, since there has been a substantial rise in the proportion of research and development whose results are not patented. For example, the results of investment in software development are not generally patented. For the same reason, in most cases there is currently no linear relationship between the number of patents obtained and the value of intangible capital, including for large public corporations.

The most impressive example in this area is the Microsoft company. According to the latest financial report, its market capitalization on 1 August 2001 was \$380 billion. The net worth of the company at that date was an eighth of that sum - \$47,289 million. All long-term assets, including software rights, totalled \$5,275 million. Meanwhile Microsoft is known to possess fewer patents than such companies as Xerox and IBM, though its market capitalization is higher.

Nevertheless, the search for appropriate observable indicators should not be regarded as hopeless. The work by Griliches referred to above was at the time almost the only success among many attempts to find an application of patent statistics as an economic indicator. The key to this success was the correct selection of observable groups of indicators and the successful definition of intangible capital. It is all the more surprising that his work is currently unknown to the community of IC specialists.

#### **1.1.2. Valuation of intellectual capital at the time of the sale of a business**

In theory the market value of a knowledge-based business should not be different from the market value of any other business generating the same financial results. In accordance with the principle known as the “Modigliani-Miller theorem”,<sup>5</sup> **the value of a company depends only on the size of the cash flow generated by its activities and does not depend on its asset structure.** However, experience offers grounds for doubting the correctness of this assertion.

The market value of a company (as distinct from its price) is a magnitude used in calculation. The actual price may be substantially higher or lower, depending on the specific circumstances in which the transaction is accomplished. Yet these differences must not completely invalidate the valuation of the business by professional valuers.

IA valuation is the most delicate part of valuation of a business. It is essentially in this context that the valuation of a business normally precedes the evaluation of IA. First, the market value of the business as a whole is determined using the income approach and/or comparable sales analysis. Then the market value of tangible assets is assessed. The valuation of IA as a whole is obtained as the difference between the market value of the company or business and the value of its tangible net assets (assets after deduction of liabilities). Only then are IA valued separately, if at all. This approach to the valuation of IA or IC is usually called the “return-on-assets” (ROA) method. Subsequently the value of IA and the value of the business are refined in the light of these refinements. The reverse sequence of actions (from assets, including IA, to the valuation of the company as a whole) is practically impossible, since as a rule there are simply not enough data to permit separate valuation of IA.<sup>6</sup>

In addition, the ROA valuation procedure tallies with the principles of bookkeeping and with the fact that usually by no means all IA at the time of the sale of the company are reflected in its balance sheet. As long as IA constituted a relatively small part of the value of a company, this did not cause any problems. The difference between the price of the sale-purchase of a company and the value of its net assets was reflected in the balance sheet as goodwill. This automatically took into account the value of all IA not recorded on the balance sheet. However, as the knowledge-based economy expanded, this practice ceased to tally with the facts. According to data published in 1994 by the United Kingdom Accounting Standards Board, the sums paid for goodwill rose from 1 per cent in 1976 to 44 per cent in 1986. In 1996, i.e. a further 10 years later, it had become clear that there was no point in attributing such a difference to goodwill, since it constitutes up to 90 per cent of the value of transactions. Accordingly, accounting practice changed. An increasing proportion of the sum received is attributed to identifiable assets, principally IP. Substantial changes were made in standards governing accounting of IA in 1999.

Modern approaches to IC, developed in the main by authors from northern Europe, Australia and the United States, go much further, requiring yet more radical changes in the principles governing the valuation and recording of IA and citing many examples of a striking lack of correspondence between the indicators of market value used for calculation purposes and the real price of transactions in the knowledge-based business sector. The clearest and most persuasive of these examples is the acquisition of the Lotus company by IBM for \$3.5 billion in the context of a balance-sheet value of \$226 million and falling profitability (Edvinsson L. , Malone M.S. 1997), as well as the repeated revaluation of the "Very Useful Company" with evaluation errors involving a factor of three (Stewart T. 1997) on each occasion. Of greatest significance in these requirements is that in valuing a knowledge-based business, the human capital which is a component of IC must be taken into account. It is quite obvious that in the acquisition of Lotus the buyers took into account the outstanding qualities of the company's management and programmers. However, it does not follow that they must be taken into account in the composition of the IA and reflected in the balance sheet. This runs counter not only to specific standards, but also to fundamental bookkeeping principles.

### **1.1.3. Valuation of intellectual capital when attracting investment**

Similar problems arise in connection with the valuation of IC for purposes of attracting investment, when this may involve other direct or portfolio investment or the purchase of shares in public corporations by small shareholders. In this way, if Microsoft shares were to be valued on the basis of dividends, they ought to stand at a fraction of the actual level (judging by actual stock exchange prices). Of course, in buying Microsoft shares, potential shareholders must take into account not only the flow of dividends, but also capital investment, i.e. future growth in the value of the company. Yet even this does not fully explain what is happening. All that may be safely affirmed is that the expectations of small investors are reflected in share prices. These expectations are highly optimistic, despite a series of court cases which have caused a substantial drop in the price.

If in the case of Microsoft the expectations of investors (small investors first and foremost) may be explained in terms of Microsoft's exceptional reputation and belief in its unsinkability, this explanation will not work for small companies. However, very high (even

excessive) expectations may be observed practically throughout the sector connected with software production and Internet services. Indeed, something similar is occurring in all science-intensive business, especially in the United States. The question arises: how do all these companies attract investors? The answer, it seems, is that they manage to successfully display their IC and persuade investors of the urgent need to invest in them, despite the absence of profits at present and in the foreseeable future.

To display IC is not always to publish a report on IC. The main element here is the creation of an image of a company which is sure to succeed. As practice shows, this happens fairly often, whereas most such successful businessmen have no concept of the practice of publishing reports on IC. Nevertheless, the practice of IC accounting and publishing reports on IC exists. On the basis of this practice the structure of IC may be assessed.

## **1.2. The structure of intellectual capital**

A fairly full overview of practice in the preparation and publication of reports on IC is to be found on the web site of the Danish Trade and Industry Development Council.<sup>7</sup> It is clear from this overview that a universal conception of the structure of IC has yet to be accepted. Nevertheless, a few general principles have already been developed. For example, human capital is identified as a separate item in all reports. The remaining part is also subdivided into a number of items, and a component known as market capital (relational capital, customer capital or brand capital) is usually identified. This part is related to the company's situation in the market, its links with customers and partners. The remaining part, which is rather heterogeneous in composition, is then called structural capital.

### **1.2.1. Human capital**

The term "human capital" was introduced into scientific parlance at least as early as 1962 (Machlup F. 1962), in connection with the knowledge economy (Machlup F. 1984). In the history of the IC movement (Sullivan P.H. 2000, pp. 238-240), the account begins with the publication of a monograph in Japanese (Itami H. 1980). This testifies to the isolated nature of the IC movement within the community of management specialists.

Human capital is not only a trained and assembled workforce, but also good management, and contracts with outstanding specialists in the area covered by the business. For example, the managers of Lucent Technology, when trying to illustrate the company's merits, first draw attention to the number of Nobel laureates working in the Bell Laboratory. The Laboratory with its unique scientific potential constitutes the principal wealth of the company, although this potential cannot be regarded as an asset in the usual sense. Human capital also includes know-how, which is inseparable from a specific individual. The use of such know-how usually requires not only knowledge of how certain things are done, but also the ability to perform the corresponding functions. This skill is seen most clearly among jugglers. Something similar takes place in surgery, where it is not enough to know how an operation is carried out - one must know how to perform it at the required level - and also in many other areas of human activity. This also relates to what is known as tacit knowledge. In order to manage human

capital successfully, management must monitor roughly the following set of parameters: education; vocational skill; work-related knowledge; vocational leanings; psychometric characteristics; work-related skills.

Human capital is not reflected in the breakdown of the company's assets, since it does not belong to the company. There is a juridical technique which makes it possible to bind the most valuable specialists to a company with the help of rewards and commitments (golden handcuffs) and to reflect contracts with them in the composition of IA. However, this technique cannot be applied to all workers. A simpler way of binding staff to a company is to make workers shareholders or co-owners of the company. This form is also not universal. Besides, the problem arises of the property rights of dismissed workers etc.

Significant problems arise in connection with taking investment in human capital into account and measuring the results obtained. Under the rules of financial reporting, the cost of staff training must be classified as expenditure and not investment, though from the viewpoint of management accounting it would be better to include it as investment. In order to assess the results of such investment, many companies devise rather complex accounting systems basically comprising qualitative indicators. The shift from qualitative to quantitative indicators expressed in money terms is rather problematic. At best one may expect the presence of dependences being fulfilled for large companies with thousands of employees.

### **1.2.2. Structural capital, including intellectual property**

Structural capital is the most heterogeneous part of IC. It covers IC rights, information resources, instructions and methods of work, the way the company is organized, etc. For all its heterogeneity it is structural capital which most corresponds to what is called IA. Structural capital encompasses systematized knowledge, including know-how, which is in principle inseparable from individuals (workers) and from the company. Thus know-how is a part of both human and structural capital. This is very important to an understanding of the phenomenon of the loss of IC value (impairment) in the event of disloyal (opportunistic) behaviour by employees or their dismissal.

### **1.2.3. Market (customer) capital**

Market capital conventionally includes: trademarks and service marks; company names; business reputation; the presence of insiders in partner or client organizations; the existence of regular customers; repeat contracts with customers, etc. (Brooking A. 1996). Only part of this list can be called assets in the narrow sense of the word. For example, people who foster the interests of one organization while working in other organizations cannot be considered as assets, although from the viewpoint of ensuring the success of the business these are very important assets. The concept of "customer capital" was introduced in 1993 by Herbert St. Onge, when he was working with the Canadian International Bank of Commerce. It must be acknowledged that the identification of this component of the total mass of IP is an outstanding achievement.

The measurement of market capital in any quantitative indicators, including its valuation separately from other components of IC, is pointless in most cases, although the quantitative measurement of individual parts of market capital is possible. Many companies show the quantity of regular consumers of their products, for example, the number of registered users of a software product, subscribers to a newspaper, etc. It has long been common to value trademarks and service marks, and recently brands, in money terms. Specifically, the Interbrand company regularly publishes the results of calculations of the value of leading brands. However, there is no unanimity among specialists concerning the relationship between the concepts of “trademark”, “brand” and “reputation”. Indeed, many of them consider the term “brand” to be jargon. Correspondingly, there is no agreement on what Interbrand is actually valuing.

With some reservations one can assume that the valuation of brands using the Interbrand technique means the valuation of market capital as a whole. In its publications Interbrand indicates the market capitalization of companies whose brands are valued, and separates out the part of the value attributable to IA (i.e. to IC). In this part the method of calculation is very reminiscent of the valuation of intangible capital, which was mentioned above, or valuation of IA using the “big cauldron” method (Desmond G.M., Kelley R.E. 1988). It is then used to obtain the value of the brand, with a different percentage for different companies, but how this is determined is unknown. In order to discuss the results of the calculations of Interbrand objectively, greater openness is necessary on the key issue - the formula by means of which the value of a brand is separated out from the value of IC as a whole.

### **1.3. Relationship between concepts**

As already noted above, the concept of IC is broader than IP or IA, although here a number of substantial reservations must be made. All three concepts differ not only as to their sphere of application, but also as to the persons who use these concepts. In other words, they enter into the professional jargon of various professional groups. The concept of IC is used basically by managers, the concept of IP by legal specialists, and the concept of IA by professional valuers and bookkeepers. Of course, managers, bookkeepers and professional valuers also use the concept of IP, but they coarsen it and, as a rule, make it much narrower. Managers and valuers perceive IA in a significantly broader sense than bookkeepers, etc.

#### **1.3.1. Intellectual capital and intellectual property**

The concept of IC as formulated in the Convention establishing the World Intellectual Property Organization (WIPO) is very broad. It embraces all rights relating to literary, artistic and scientific works, the performances of performing artists, phonograms, and broadcasts, inventions in all fields of human endeavour, scientific discoveries, industrial designs, trademarks, service marks and commercial names and designations, protection against unfair competition, and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields. In this context IP includes not only property rights but also moral rights, including the right to integral performance, the right to a name, etc. These rights by no means necessarily give rise to revenue. Consequently they cannot be categorized as IC.

The subsequent stage in refinement relates to individual types of IC. The most significant of them relate to the different concept of know-how in the concepts of IP and IC, and also the relationship between the concepts of “trademark” and “brand”.

From the business point of view it is customary to distinguish three types of know-how: that which is not dissociable from a specific individual (employee), that which is not dissociable from a company, and that which is dissociable in general from an individual and from a company. Juridical protection is extended only to the third type of know-how. Only such know-how may be considered to constitute the assets of a company in the full sense of the word. However, in its actions management must take into account the existence of the three types of know-how.

A brand is the commercial equivalent of a reputation. It is reputation, and not a trademark, which constitutes the obligatory element that is present in all variants of the use of the term “brand”. This term is widely used by specialists in advertising and management and by professional valuers. In this context “brand” may also be understood as the name of a well-known company, and the name of a popular good, and a well-known trademark. However, the presence of a trademark is not mandatory. Consequently, to link a brand with a trademark is not entirely correct. Moreover, unlike a trademark, the term “brand” has no legal definition. However, IC management implies the identification and valuation of brands themselves, and not trademarks.

### **1.3.2. Intellectual capital and intangible assets**

The relationship between the concepts of IC and IA is equally complex, if IA is understood in the precise accounting sense. It is customary to define IA as any long-term assets which are not linked directly with any tangible object. For a long time IA were considered to include any assets for which no place had been found among other “normal” assets. Consequently the composition of IA is highly heterogeneous. The best-known of them - goodwill - is obtained as the difference between the price of buying a company and the value of its net assets - i.e. it is essentially a bookkeeping fiction which is not connected with any specific object apart from the company as a whole. The same applies to “going concern”, although this asset arises in a completely different manner. These assets are called unidentifiable assets or goodwill-type assets. Essentially they constitute bookkeeping fictions. Moreover, IA include a multitude of identified assets, i.e. assets linked with a specific non-material object (an invention, a trademark, etc.), improvement of leased property, a contract, etc. The basis for accounting of any such asset on the balance sheet is usually the existence of outgoings on acquiring or creating it. In other words, the balance sheet reflects not assets as such, but bookkeeping operations linked to their acquisition.

IP rights constitute only a part of identified IA. This is the most significant part of such assets, but by no means all. In this context a significant part of the IP rights belonging to a company are not reflected on the balance sheet, as they did not arise in connection with any bookkeeping operations. Most often copyright is not reflected on the balance sheet because it arises by virtue of the creation of a work, while the corresponding costs can be recognized as expenditure.

Thus IA may include assets which are not at all related to IC (for example, improvement of leased property), while many components of IC do not form part of IA, if IA are understood in a bookkeeping sense. In principle components of IC which do not belong to the company, including human capital and part of market capital, cannot form part of IA. In addition, copyright and neighbouring rights that belong to a company are not usually taken into consideration in a company's IA, although in theory they can be. Experience shows that many companies do not seek to reflect such assets in their balance sheets, although they do seek to display them to potential investors. As a result a huge gulf is created between the balance-sheet value of a company and its market capitalization. In the case of Microsoft this gulf reached two orders of magnitude (100 times) in 1999. Roughly the same may be observed with many Internet companies. From this point of view the desire to reflect IA more accurately in balance sheets (Wyat A. 2002) is questionable.

It should not be concluded from the above that bookkeeping needs to be changed radically. Here we are dealing with the fundamental contradictions between the principles of bookkeeping and the properties of the knowledge economy (or the algebraic properties of knowledge itself). Bookkeeping is based on the principles of ordinary arithmetic. If there is an increase somewhere, then there must be an equivalent decrease somewhere else. Knowledge is subject to completely different algebraic rules (non-rivalrousness); it lacks the quality of scarcity (Stiglitz J.E. 1999). Three Nobel laureates have drawn attention to this property (L. Kantorovich, W. Leontief, K. Arrow). This has gone unnoticed in the literature on IC. These contradictions may be smoothed over, but they cannot be overcome. Indeed, there are grounds for considering that the scope for smoothing over the contradictions is almost exhausted, i.e. international financial accounting standards in this regard are close to perfection. In this context bookkeeping information remains one of the most important sources of information used in valuing a business and taking decisions on the investment of capital in one company or another. But it must be supplemented by other forms of accounting.

### **1.3.3. Intellectual capital accounts (experience in the countries of northern Europe)**

Intellectual capital accounts prepared and published by a few companies constitute a supplement to traditional accounting reports. These accounts are viewed as an instrument for measuring IC, managing it and displaying the company's attraction to investors. Such accounts are of two types. The more detailed account is prepared for internal requirements, first and foremost for management and to display to the staff of the company for the purpose of consolidating common efforts. The abbreviated report, which omits information that is not intended for public distribution, can be prepared for publication with the aim of attracting investment or for distribution to potential investors.

It is essentially the published accounts which are available for research. They are based on a variety of models for the presentation of information and bear a variety of names, such as "Holistic accounts" (Rambøll), "Quality accounts/ethical accounts" (Consultus), Navigator (Skandia), "Human resource accounts" (SCAA, ABB, Telia). Nevertheless, all these accounts may be viewed as IC accounts - they must all show the investor how the company is moving from its present situation to the situation which it can and should occupy.

The “What there is” section generally contains visualized information on the company’s present resources. A significant part of this information is of a non-financial nature. Information on human resources, customers, technology is supplied in the form of graphs, figures, etc.

The “What is done” section contains essentially non-financial information concerning the efforts of management to develop the company’s IC. Special attention is paid to the development of human capital, customer care, access to technology.

Finally, a third section, “What happens”, displays movement towards the set target. In this section financial indicators are essentially used to show how the company’s IC is making it possible to generate profit through the appearance of new goods or services which customers need.

IC accounts cannot stand alone. They become important only when seen in a context. This context is the vision of the management system and the competition form. In this context IC accounts supply a new reality. They give a more adequate idea of the new reality than the traditional IA. IC accounts make it possible to throw light on the astounding gulf (involving a factor of 10 and even hundreds) between the balance-sheet value and the market capitalization of companies. In addition, a fairly profound meaning is contained in the differentiation of the components of IC, separating out human capital, market capital, etc. Under the IC approach, if the company loses one of these components, then its entire IC is impaired, and consequently so is the company itself. This involves a clear violation of the principle known in the theory of corporate finance (Brealey R.A., Myers S.C. 1991) as the law of conservation of value. According to this principle, **the value of an integral unit is equal to the sum of the values of its parts**. In the case of components of IC this principle may be used only in order to give each of the parts of IC a certain value. However, for the purposes of practical decision-making it is not only unproductive, but causes confusion. This is very important. In order to draw attention to it Edvinsson even states that the value of IC components must not be added, but multiplied! Then it is obvious that if the value of one of them is zero, the value of the entire IC is zero. IC accounts just show relatively weak points and the efforts of management to regulate the situation, and offer hope that as a result the value of the whole business will rise sharply.

Practice shows that potential investors readily acquaint themselves with IC accounts. For them it is not so important that the IC valuation should be expressed in monetary terms, but the clear presentation of data is very significant.

It should be pointed out that the reaction of investors to IC accounts requires further research. In the period 1995-2000, decisions on investment in knowledge-based business were taken too often without proper preparation, and even in the absence of any business plan. This enables us to speak of excessive expectations on the part of investors. But it was this very period that saw the main wave of enthusiasm regarding IC accounts.

#### **1.4. Valuation of patents and sales licences**

Valuation of patents and sales licences is a relatively thoroughly studied problem. There is extensive literature on this subject, some of it of very high quality (Romary J.M. 1995). In this paper, attention will focus on individual aspects which are essential for an understanding of the remainder.

##### **1.4.1. Parties in licensing agreements and negotiations**

It is when a patent or licence is sold that IP is the object of the sale-purchase. Consequently, in this case one may speak of the market value of IP and methods for determining it.

Where the price of the licence is concerned, the parties to the licensing agreement are pursuing not mutually exclusive but opposing goals. The licensor (the seller of the licence) is interested in the highest possible price, the licensee (the buyer) the lowest. Here lies the difference of principle with corporate transactions, where the goals of the parties may coincide, and with the valuation of damage when exclusive rights have been violated, when the parties are pursuing mutually exclusive goals.

Negotiations on the price of a licence or patent normally take place with the participation of professionals, each of the parties appointing a team for the negotiations. Even in principle the question of independent valuers does not arise here. This is very important to an understanding of the differences between IP valuation and valuation of other assets, if valuation is understood as a type of professional activity. It is when determination of the market value of IP for the purpose of sale is involved that the participation of independent professional valuers is not required. As a rule, the team for the negotiations is formed of legal specialists, patent lawyers, technical specialists and specialists in the market for the goods to be produced under licence.

##### **1.4.2. Types and scales of payment**

The following circumstance, which is important for understanding of the situation, is linked with the form of payments under the licensing agreement and what precisely should be understood by valuation. Professional valuers and specialists in trade in licences approach this issue from different viewpoints and reach different conclusions.

As a rule, payments under a licensing agreement consist of a lump-sum payment and percentage deductions from subsequent sales (royalties). There are many combinations of these forms, with royalties linked to various monetary or physical indicators, payment schedules, changes in the royalty rate over time, etc. The ability to correctly select the combination and propose well-founded royalty rates and the size of the lump-sum payment to a large degree determines the success of the negotiations. Here specialists in trade in licences understand valuation to be specifically the well-founded selection of royalty rates and the lump-sum payment. The shift from royalties to a lump-sum payment, i.e. the discounting of expected cash flows, is for them just a mental exercise. The contract indicates the royalty rates and the lump-sum payment.

It is precisely the discounting of all expected cash flows that professional valuers understand as IP valuation. The key element in this process is the selection of the discount rate. However, if the settlement is carried out through the payment of royalties, the problem of selection of the discount rate simply does not exist. This is the significance of the use of royalties.

When selling a patent it is really essential to obtain its valuation in the form of a figure, i.e. not only to express the purchaser's expected profits in monetary form, but also to discount them in relation to the present moment, i.e. the moment of the conclusion of the deal. But the sale of a patent is a much rarer event than the sale of a licence.

#### **1.4.3. Calculation of the royalty rate**

The methods used in calculating the royalty rate for a specific transaction are fairly varied, but they are all highly approximate. The simplest of them are based on the use of tables of average royalty rates by industry and group of products. Such tables are compiled on the basis of data on a large number of deals. These data are sometimes published, but more often they are supplied against payment as a form of information service.

It should be pointed out that the use of tabular data creates a dangerous illusion of simplicity. The less one is prepared, the more readily one will use such tables, and the less critically one will look at them. Meanwhile, the selection of a baseline to which the tabular rate is applied is of critical importance - whether the price of the whole item produced under licence, or only part of it. More delicate questions relate to refinement of the royalty rate for specific cases. Such data cannot be obtained from the tables.

A more complex approach called the income approach involves direct calculation of the profits which the licensor who has bought the licence will receive, and the losses which will be borne by a licensor who has been deprived of a monopoly on the use of a patented design solution. If the licensor's losses are smaller than the licensee's profits, then there are objective grounds for the conclusion of a contract. The problem lies in the extraordinary difficulty of calculating the profit obtained by one party and the loss suffered by the other. This problem is barely discussed in the literature on valuation of IP and IA, since it goes far beyond the boundaries of this topic. Nevertheless, it can be the subject for thoroughgoing scientific study.

#### **1.5. Valuation of damage when exclusive rights are violated**

Valuation of damage when exclusive rights are violated is the area of valuation activity where the parties (the victim and the violator) have practically no chances of reaching agreement. More precisely, if the parties find a common language, the case passes smoothly into the sphere of trade in licences, i.e. the violator becomes a licensee. Cases of interest are those where it is impossible to reach agreement on the extent of the damage, including criminal cases of piracy.

### **1.5.1. Valuation of harm caused by pirates in the field of copyright and neighbouring rights (audio, video, software)**

In court cases concerning violations of copyright and neighbouring rights which have caused significant harm, the victim usually institutes proceedings specifying the amount of the harm, while the violator or his counsel demonstrate that the question of harm on such a scale does not arise.

The method for calculating the harm alleged by the victims is normally based on the proposition that one pirated copy of a music album, film or computer program displaces one legal copy of the same work from the market. Of course, this approach does not suit the violator. However, the problem lies not only in his or her refusal to acknowledge the result obtained, but in the fact that this refusal may be well founded. If the court and the victim do not succeed in demonstrating to public opinion that the decision taken by the court on the basis of the proceedings brought by the victim is fair, it cannot be regarded as fully satisfactory. If such situations arise systematically, society may face much more serious problems than piracy. Consequently the principles on which the calculation of harm is built must be well founded in the framework of independent research, and society must acquire ownership of the results produced.

### **1.5.2. Valuation of harm caused when a right to industrial property is violated**

In principle the same problem arises when valuing harm resulting from the violation of the rights of the holder of a patent or trademark. However, here it is less acute. In the case of a violation of a right to a trademark, the consumer usually turns out to be not only on the side of the victim, but one of the victims, having been sold a forgery instead of the branded product. In the event of real or alleged violation of a patent, the product manufactured in violation of the patent does not normally differ in price from the lawfully manufactured product, or does not differ very substantially. Consequently, the assumption that one unit of the product manufactured lawfully is displaced by one unit of the counterfeit product is quite realistic. For the same reason no conflict arises between the victim (the patent holder) and the consumer.

### **1.5.3. Standardization of approaches to valuation of harm**

In this way, the problem of valuing harm caused, or, to be more precise, the problem of justifying the basic principles applied in valuing harm caused, is most acute for violations in the sphere of copyright. In a few countries, for example France, the victim is not obliged to demonstrate each time that the valuation method it proposes is scientifically well founded. There are standard approaches which enable the court to reach a decision fairly expeditiously. In countries where such standard principles are not applied, for example in Russia, each piracy case becomes a major problem for the investigators and the court. This points to the urgent need to develop such principles which can be recommended for inclusion in the legislation of all countries.

## **2. Valuation methods**

To date the best-known, most complete and most precise of the published works on IP and IA valuation is that of Smith G.V. and Parr R.L. (2000). In addition, there are excellent aids to the valuation of trademarks (Smith G.V. 1997) and the valuation of early-stage technologies (Razgaitis R.S. 1999). A brief synopsis of the current literature on this topic is provided below.

### **2.1. The income approach (method)**

The income method in its broad sense is considered to be the principal method of establishing the value of IP rights. The comparative sales method (the market method) and the cost approach may be used to supplement the income method.

The income method has many variants, which are often referred to as separate methods. Principal variants of the income method:

- Method D1 - Royalty relief;
- Method D2 - Discounting/capitalization of advantages in income;
- Method D3 - Discounting/capitalization of cost savings.

Each of the three main variants can be applied in two modified forms, designated by the letters (a) and (b). Modification (a) is based on the capitalization of the average profit or cash flow, while modification (b) is based on the discounting of expected cash flows or expected profits. In each case either profit (before or after tax) or cash flow may be selected as the indicator of profitability. The modifications of all three basic variants of the income method which have the best underpinnings in theory, and at the same time are the most complex, are based on cash flow discounting, while the simplest modifications are based on direct capitalization of profit. Selection of a method is defined as a compromise between a desire for a high-quality result and a judicious desire for simplicity in the valuation procedure.

#### **2.1.1. Cash flow discounting**

In order to establish the market value of IP rights, method D1 is most convenient, used either in modification (a) with capitalization of profit (before tax) or in modification (b) with discounting of expected profit (also before tax). This method is most suited for valuing patents and licences for sale.

The basis used for the calculation is the assumed licence payments in the form of royalties - regular payments calculated as a percentage of the earnings received as a result of the realization of production under licence. The size of the royalties is determined in the light of previous experience, using a special table of standard industrial royalties or some other relatively simple method.

The calculation method may be broken down into the following seven stages:

1. A forecast is prepared of the volume of sales from which the payment of royalties is expected. The forecast is prepared in physical and value terms and broken down by year or shorter interval.
2. The royalty rate is determined. If experience in the sale of licences of a similar type is lacking, the data are taken from the tables of standard royalty rates. The tables are also published.<sup>8</sup>
3. The economic life of the patent or licence is determined. It may be significantly shorter than the legal life, if the invention becomes obsolete before the validity of the patent expires.
4. Expected payments in the form of royalties are calculated. As a rule, royalties are deducted from the volume of sales in value terms for the periods into which the entire economic life of the patent or licence is broken down. But royalties calculated on the basis of the number of units of manufactured production are also used.
5. From the expected payments in the form of royalties are deducted all costs associated with maintaining the patent in force etc. (if they are of the same order of magnitude as the expected royalties).
6. The discounted flows of the profit obtained from payments in the form of royalties are calculated. The discounting coefficients are determined on the basis of the sphere of application of the invention and of industrial and individual risks.
7. The discounted value of the profit flows for the entire period is determined. For this discounting operation the profit flows are added together.

The flow of profit in the current year is recorded with coefficient **1**. It is considered to consist of those resources which are received or must be paid immediately.<sup>9</sup> For each subsequent year the discounting coefficient is obtained by multiplying the coefficient for the preceding year by the value

$$1/(1+r)=100/(100+\text{discount rate})$$

where **r** is the discount rate expressed in decimals (it is equal to the discount rate in per cent divided by 100). The sum obtained is known as the present value (designated **PV**<sup>10</sup>). It may be expressed by the formula:

$$PV=CF_0+1/(1+r)\times CF_1+[1/(1+r)]^2\times CF_2+\dots+[1/(1+r)]^T\times CF_T$$

where **PV** is the discounted value of the final sequence of the flows **CF**<sub>0</sub>, **CF**<sub>1</sub>, **CF**<sub>2</sub>, ... **CF**<sub>T</sub>, the index **0** corresponds to the current year, the index **T** to the last year of use of the asset being valued.

The advantages of method D1(b) are: (1) the ability to use it both in valuing IA (IP rights) which are already being used and in valuing IP rights whose use is only proposed; (2) relative simplicity of use; (3) the ability to use standard industrial royalty rates. Method D1(a), as a rule, produces a valuation which is too crude, but it is simpler to use.

The other variants of the income method are recommended for use when the method of relief from royalties is not applicable. For example, when establishing the value in use of rights to know-how, it is better to use the method of capitalization of cost savings.

When establishing the investment value of an investment in the form of IP rights in the registered capital of a new corporate body or portfolio of IP rights being used in an investment project, the method of discounting of advantages in income should be used.

### 2.1.2. Direct capitalization

Capitalization is a simpler procedure than discounting. However, its use is recommended when the asset being valued is already in use and generating a steady income, or there is a need for a rapid fairly crude valuation of an asset which is expected to generate a steady income. Profit is a more convenient indicator for capitalization than cash flow.

Capitalization of profit makes it possible to determine fairly precisely the value of an asset in cases where the profit from the use of the asset being valued is steady. For example, this profit is constituted of licence payments (royalties) for the use of a patented invention which are constant in volume, while the asset being valued is made up of exclusive rights arising from the patent for the invention. The profit before tax is used in the calculation, since the purpose of the valuation is to determine the market value of the asset. It is assumed that the asset is taken into account off the balance sheet or on the balance sheet with the valuation according to minimum value. On the sale of the asset for price **V**, i.e. the calculated market value, this entire sum will constitute the profit before tax.

In order to determine the market value for the existing use of an asset which is generating a steady income, the annual profit (before tax) obtained from the use of the asset being valued during the current year must be multiplied by a special multiplier **M**:

$$\mathbf{V=Mx(\text{profit from the use of the asset during the year}).}$$

If the profit is constant, the multiplier is calculated according to the formula:

$$\mathbf{M=1/r_0=100/(\text{rate of capitalization}),}$$

where **r<sub>0</sub>** is the rate of capitalization for steadily operating enterprises in the industry concerned, expressed as a decimal (it is equal to the rate of capitalization in per cent divided by 100). If the profit is steadily growing at rate **g**,

$$\mathbf{M=1/(r_0-g).}$$

To obtain the valuation of an asset generating a steady or steadily growing profit, use is made of multipliers and rates of capitalization calculated using special methods on the basis of stock market data. Usually a capitalization rate is selected of between 10 per cent and 50 per cent, corresponding to the values of the multiplier  $M=10$  and  $M=2$  respectively. For IA the rate of capitalization is usually higher than for other assets and for the business as a whole. For the valuation of the business, multipliers from 6 to 8 are most often used, while in valuing IA the multiplier may be equal to 3-5.

### **2.1.3. Merits and shortcomings of the income approach**

The advantage of the income approach is that it is universal, theoretically well-founded and makes it possible to determine precisely that value of the asset (market value, investment value, etc.) which must be determined in accordance with the type of transaction being conducted and the purposes of the valuation. The principal shortcoming of the income approach is the complexity involved in obtaining the necessary initial information for the calculations.

## **2.2. The market approach**

The market approach to the valuation of assets (including IA) is first and foremost a comparison-of-sales method. In addition, under the market approach it is customary to consider other methods based on the use of generalized information on market sales.

### **2.2.1. Comparison-of-sales method**

The comparison-of-sales method in the traditional sense is practically not applicable in the sphere under consideration, except for the valuation of rights to programs for computers being transferred on the basis of shrink-wrap licences. The comparison-of-sales method may also be used to supplement the income method. However, all transactions in which the need arises to value IP are rather unique. It usually proves impossible to find suitable similar deals.

### **2.2.2. Use of industrial indices (standard royalty rates)**

One of the variants in the application of the market approach may be considered to be the use of standard industrial royalty rates. The literature describes cases where such industrial standards were established spontaneously and functioned for a number of years (Romary J.M. 1994).

### **2.2.3. Merits and shortcomings of the market approach**

The market approach has two undoubted merits. Firstly, it is based on the use of market information, and secondly, it is simple to use. However, the second merit can very easily prove to be a shortcoming. The simplicity of use of the market approach is merely apparent. The standard royalty rates for specific types of product, industrial indices and other indicators produce very approximate guidance for the conduct of actual transactions. The entire difficulty lies in taking into account the individual features of a specific transaction, and it is here that the market approach provides no guidance.

### **2.3. The cost approach**

The cost approach is viewed in the literature on IP valuation as one of three possible approaches. It is considered suitable only as a supplement to the income method (if the valuation is not for bookkeeping purposes). This approach, like the previous two, can be applied in a number of variants.

#### **2.3.1. Cost of asset reproduction (reinstatement)**

The most consistent application of the cost approach is the direct calculation of the costs of activities whose outcome was a patentable invention, computer program, etc. It should be emphasized that what is involved is not accounting of costs with reflection in the accounts, but simply calculation. As a variant it is possible to calculate which costs would be required for the conduct of the same activities taking into account the prices and rates of payment on the date of the valuation. Such calculations are often carried out when immovable property is being valued. However, with regard to IA they generally have no meaning. The result of creative activity is too much a result of creativity, and not a cost.

#### **2.3.2. Replacement costs**

Roughly the same can be said of another variant in the application of the cost approach, at the root of which lies the idea of replacement of one asset by another which is of equal value from the viewpoint of the function performed. To a certain extent this substitution is also possible with respect to IA. For example, the replacement of one entertaining film by another which is similar in content normally has no major significance, if the public merely wishes to pass the time happily, the advertiser to place the advertisement and the cinema owner to sell tickets. However, the possibility of making such a substitution is the exception rather than the rule.

#### **2.3.4. Shortcomings in the cost approach**

The cost method has one very significant shortcoming. The valuation obtained using this method bears no relation to the real value of the asset being valued (of course, this applies only to IA).

### **3. Institutions**

The transformation of knowledge, reputations and other intangible values into capital which generates revenue and is measurable in monetary terms is effected by institutions which constitute the soft infrastructure of the market. These institutions include: (1) copyright and patent rights, other institutions of intellectual property, legislation on competition; (2) bookkeeping records of IA; (3) the customs of business, including standards and methods of valuing business and IA, which are used by professional valuers, technological brokers, etc.

### **3.1. Professional valuation**

IP valuation is an extensive sphere of activity which only partially intersects with the sphere of professional valuation, i.e. the professional assessment of the value of property, including IA. It includes the valuation of patents and licences for sale and valuation of harm caused when exclusive rights are violated. Both have only an indirect relationship with the activities of professional valuers. The same may be said regarding the valuation of early-stage technologies. In this section the subject of the analysis is not so much the valuation of IP as that part of the institution of professional valuation which relates to the valuation of IA.

#### **3.1.1. Organizations of professional valuers and valuation standards**

In most countries valuation activities are regulated by professional organizations of valuers, which draw up and adopt their own standards of valuation. These standards are mandatory for the members of the organizations.

There also exist associations of self-regulating organizations of valuers, created at the national, European and worldwide level for the purpose of harmonizing standards governing valuation activities. The most prestigious of these organizations is the International Valuation Standards Committee (IVSC). This Committee (IVSC) draws up and regularly publishes additions to and changes in international valuation standards, on the basis of which the self-regulating organizations in the various countries draw up their own standards.

The sphere of activity of professional valuers is traditionally divided into subject areas, among which there is no such field as IP valuation. An exception to this rule is Russia, where IP valuation is a separate field and the corresponding option exists during training of valuers in institutions of higher education. In the countries of Europe it is customary to make a separate subject area of the valuation of IA, the valuation of IA always being closely linked to the valuation of businesses. In the United States in general the valuation of businesses and IA are regulated by a single standard. There is sufficient justification for this, principally unity of approach and methodology for the valuation of businesses and IA. The same unity of methodology in valuing a business (enterprise) and IA is characteristic for other countries, including Russia.

Another but no less important justification for combining the valuation of a business and valuation of IA is linked to the growth in the role of IA in the value of companies. The author of The Age of Reason, Charles Handy, wrote that the IC of a corporation is usually three to four times greater than the value of all its tangible assets. However, as early as 1966 Leif Edvinsson considered these data to be obsolete. Then he valued the range of this indicator for the majority of companies at between 5:1 and 16:1. Between 1996 and 2001 the importance of IC grew steadily. In other words, the value of present-day companies is basically determined by the IC they possess. At the same time, the value of IC must be spoken of with care, since IC to a large extent consists of elements which in principle are not sold, and consequently have no value in the generally accepted sense. In any event, one may not speak of the market value of IC. In this context one may speak of the value of a business and the value of a company as a whole, since companies are sold from time to time; each transaction in this sphere gives rich food for analysis and reflection.

### **3.1.2. Valuation of intangible assets according to international standards**

The international valuation standards adopted in 2001 consist of standards proper and guidance for their application. Specifically, guidance note No. 4 is devoted to the valuation of IA. It should be noted that up to 2001 IVSC was unable to adopt a single official document on IA valuation - there were only drafts. This fact points first and foremost to the complexity of standardizing the valuation of IA and the responsible approach adopted by IVSC to this problem.

At the same time, guidance note No. 4 adopted in 2001 should not be regarded as a success. It is too strongly imbued with the standard thinking intrinsic to professional valuers and the insufficient understanding most of them display of the specifics of the subject. The concepts and methods used in the valuation of IA are generally the same as in the valuation of other types of assets. The specifics of valuation of IA are expressed too weakly, and the classification of IA is very approximate. Thus, all elements of market capital are combined in the concept of goodwill, elements of human capital (or more precisely, its traces) are included in the concept of going concern as “intangible elements of the value of an operating business”. The explanation of IP is absolutely unintelligible. Of course, one can assume that in the national standards of each of the countries this concept will be correctly interpreted in the light of the specific features of the national legislation in this field. But another explanation is much more likely - a not very sure grip of the subject.

The same explanation can be advanced for the absolutely serious approach to the cost method - in particular, the detailed consideration of the “cost of recreating” the intangible asset and the “cost of replacing all of its constituent parts”. In relation to the greater part of IA these arguments look odd.

Overall a fairly large portion of the guidance is wasted in a surprisingly limp manner on recommendations, some of which are correct but absolutely not specific to IA, while others are not applicable to IA. In this connection the adoption and publication of this guidance must be regarded as a failure. Indeed, there are grounds for supposing that IVSC as currently constituted is absolutely not ready for methodological work in the field of IA valuation.

### **3.1.3. Valuation of intangible assets using European standards**

In November 2000 the European Group of Valuers' Associations (TEGoVA) published new valuation standards,<sup>11</sup> which are supplemented by methodological guidance. One of the guidance notes - No. 8 - is devoted to valuation of IA, including IA which are not included in a company's balance sheet. Moreover, the notes reflect a new paradigm of the evaluation of a business, based on the theory of IC. The content of the IA which are subject to valuation offers fairly convincing evidence of this. According to the note, all IA subject to valuation, including IA which are not taken into account in the balance sheet, are divided into three categories:

1. Goodwill of a business (undistributed intangible assets);
2. Personal goodwill; and
3. Identifiable intangible business assets.

Business goodwill is inseparable from the company and may be taken into account on the balance sheet after its sale in accordance with the principle set out in 2.4.2. Personal goodwill, as a rule, is linked to the person of the head of the company, is not transferred when it is sold and consequently is not taken into account when its value is calculated, except in cases where, after a change of company ownership, the same person continues to head it.

Identifiable business IA can be individually valued if a finite economic life can be attached to them, and if over that period they produce benefits for the business. Usually this category includes IP rights and other similar assets, including know-how, information resources,<sup>12</sup> lists of customers, etc.

In addition, under guidance note No. 8 IA include:

- Trained and assembled workforce;
- Favourable labour agreements;
- Affiliation agreements;
- Favourable leases;
- Favourable supply contracts;
- Favourable insurance contracts;
- Employment contracts;
- Covenants not to compete;
- Customer relationship;
- Permits;
- Technical libraries and newspaper libraries;
- Other intangible assets.

Of the entire list of potential IA, the following definitely form part of human capital: personal goodwill, trained and assembled workforce; favourable labour agreements; employment contracts. These assets, as a rule, are non-transferable. Exceptions are employment contracts which provide for the possibility of transferring the recruited person to another company. In addition, know-how forms part of both human capital and structural capital.

Human capital, as stated above, cannot be the property of the company. In this lies a difference of principle from the property rights arising in particular from the obligations of the employees of a company. At the same time, human capital plays almost the leading role in

shaping the value of the company. Property rights, as a rule, can be included as part of IA, and contracts with the most valuable employees may be transformed into company property by the use of a fairly refined legal technique.

Customer capital is represented in guidance note No. 8 by such IA as covenants not to compete and customer relationship. Some IP rights should probably also be included here, including rights to: trademarks, service marks, names of places of origin of goods, brand packaging, brand names. In this context IP rights may be taken into account on the balance sheet, but covenants not to compete and customer relationship, as a rule, may not. In other words, here there is yet another gulf between the composition of IA in the valuation and the bookkeeping sense.

The specific features of guidance note No. 8 set out above provide grounds for affirming that this guidance has been drawn up on the basis of a theory of IC, or at least taking it into account. However, note No. 8 does not contain any recommendations concerning the effecting of measurements or calculations that differ from the standard valuation procedures. Nevertheless, the note concedes that, where necessary and justified, methods of calculation may be used which are different from those specified in the standard. This rule is customary for this type of normative document.

### **3.2. Taking into account intangible assets**

Bookkeeping is justifiably considered as one of the basic elements of “soft” infrastructure. Correspondingly, IA accounting is one of the most important institutions which ensure the transformation of intangible values into capital.

#### **3.2.1. Taking into account intangible assets in accordance with the international standard**

International accounting standard (IAS) No. 38, on intangible assets, which lays down a procedure for taking into account and reflecting IA in accounts, was drawn up by the International Accounting Standards Committee (IASC) Board as one of its last - in July 1998. Apart from the standard referred to, taking into account IA is touched on by the provisions of IAS 22, on business combinations (revised 1998), IAS 36, on impairment of assets (approved by the IASC Board in April 1998), and several others. IAS 38 directly relates only to identifiable IA, and only those which are not specifically dealt with in other standards. Thus, IAS 38 does not apply to financial assets, rights to exploration or development and extraction of minerals, petroleum, natural gas and similar non-renewable resources. In the first place IAS 38 relates to IP. Taking into account assets of the goodwill type is regulated by IAS 22, which is perfectly logical, since bookkeeping goodwill arises as a result of precisely such operations.

IAS 38 provides that the company should recognize IA, at cost, if and only if:

- (a) It is expected that future economic benefits relating to the assets will flow to the company; and
- (b) The cost of the asset can be measured reliably.

The two requirements are applied both to IA acquired externally and to those generated internally (para. 19). In this context IAS 38 contains additional criteria concerning recognition. Not recognized as assets are internally generated goodwill, original trade names (marks), publishing titles, slogans, customer lists and items similar in substance.

From here it is fairly obvious that practically all costs connected with the generation of IA in the broad sense are taken into account as expenditure (for example, costs of research, training, advertising, etc.), while IA generated in this process are not taken into account on the balance sheet.

In the Russian-language version IAS 38 uses not the terms NIR [scientific research] and OKR [development work], which are usual for legal normative instruments, but the concepts of “research” and “development”, defining them as follows.

Research is original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding.

Development is the application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of commercial production or use.

Under paragraphs 42 and 43, expenditure on research is always recognized as an expense when it is incurred. That is predetermined by the impossibility of demonstrating at this stage a link between the IA being generated and probable future economic benefits.

To all appearances, this rule embodies the most fundamental difference between the IAS approach to taking into account research costs and the Russian approach to the same issue. The Russian bookkeeping rules do not forbid capitalizing costs for NIR and OKR. This is mistakenly perceived by many specialists as conferring an additional degree of freedom. In fact this IAS norm relieves the bookkeeper of the need to take the same correct decision each time. This is like the railing which separates the pedestrian from the carriageway or the spectator on a high observation platform from its dangerous edge.

The phase of creation of IA which is known as development is much more open to analysis and relatively safe in the sense that a negative result may appear. At the same time, it is more capital-intensive. Consequently, under paragraph 45 of IAS 38, development costs should be recognized as IA if the company can demonstrate all of the following:

- (a) The technical feasibility of completing the intangible asset so that it will be available for use or sale;
- (b) Its intention to complete the intangible asset and use or sell it;
- (c) Its ability to use or sell the intangible asset;

(d) How the intangible asset will generate probable future economic benefits. Among other things, the enterprise should demonstrate the existence of a market for the output of the intangible asset or the intangible asset itself or, if it is to be used internally, the usefulness of the intangible asset;

(e) The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset; and

(f) Its ability to measure the expenditure attributable to the intangible asset during its development reliably.

“If an enterprise cannot distinguish the research phase from the development phase of an internal project to create an intangible asset, the enterprise treats the expenditure on that project as if it were incurred in the research phase only” (IAS 38, para. 41).

In other words, if the risk of obtaining a negative result is lower, but costs rise, and may consequently lead a loss of proportionality in relating them to expenditure for one year, then the restriction is relaxed. Translated into imagery this means that the railing ceases to be continuous, and that specially placed passages and signposts appear in it.

Externally there is little connection between all this and the algebraic properties of information, knowledge, inventions, etc. However, the lack of a connection is misleading. The connection may be perceived if one examines the motivation of investment in research and development. On the one hand, this investment may not lead to any positive result. On the other, if the result is positive, it may be used in many ways. It is precisely because of the possibility of making a number of uses of individual positive results obtained against a background of almost chronic failures that investment in research and development pays off at the statistical level. To one degree or another this conclusion may be applied to other IA for which, under IAS 38, the costs of creation are recorded as an expense.

Outlays on advertising, the development of successful slogans and generally the creation of a company image, it seems, have little in common with outlays on research, but there is something common here. This common feature appears most clearly in the dependence of the effect on the size of the company, its turnover. If a successfully chosen slogan or trademark leads to 1 per cent growth in the volume of sales or the price of the good, the effect is proportional to the size of the company, while costs for the development of a slogan or trademark do not depend on company size. Roughly the same thing happens with the results of research. If research makes it possible to raise the productivity of labour or the quality of the goods produced, the effect in monetary terms will be directly proportional to the size of the company, or, more exactly, to the scale of use of the result obtained.

The aspect of taking goodwill into account is considered in IAS 22, on business combinations, in the section on the purchase of one company by another. The definition of the concept formulated in paragraph 42 of IAS 22 leaves no doubt that it is a question of a purely bookkeeping concept of goodwill: “Goodwill arising on acquisition represents a payment made by the acquirer in anticipation of future economic benefits. The future economic benefits may

result from synergy between the identifiable assets acquired or from assets which, individually, do not qualify for recognition in the financial statements but for which the acquirer is prepared to make a payment in the acquisition.”

“Any excess of the cost of the acquisition over the acquirer’s interest in the fair value of the identifiable assets and liabilities acquired as at the date of the exchange transaction should be described as goodwill and recognized as an asset” (para. 41). Otherwise “goodwill”, i.e. “the full difference between the acquirer’s interest in the fair values of the identifiable assets acquired less the cost of acquisition”, is recognized as negative.

“Goodwill” should be amortized on a systematic basis over its useful life. The amortization period should reflect the best estimate of the period during which future economic benefits are expected to flow to the enterprise. There is a rebuttable presumption that the useful life of “goodwill” will not exceed 20 years from initial recognition (para. 43). If the presumption of the 20-year term is disputed, the “goodwill” is checked annually in relation to the decline in value, and here the reasons for the disputing of this assumption are revealed, including losses from impairment of the assets (IAS 36).

In this way, international standards include a technique which makes it possible to minimize the negative consequences of the fundamental contradiction referred to above.

### **3.2.2. The contradiction between valuation and accounting standards**

Bookkeeping or financial accounting is a more conservative institution than that of professional valuation. Consequently contradictions arise between them.

Most obvious are the contradictions between the TEGoVA 2000 standard and IAS 1999. In particular this relates to the valuation and taking into account of IA. The list of assets liable to valuation and that of assets taken into account on the balance sheet does not coincide. In addition, guidance note No. 8 to the TEGoVA 2000 standards recognizes this fact to be unavoidable. The assets liable to valuation include “personal goodwill” and “trained and assembled workforce”, but as separate assets. The standard for accounting of IA assumes that goodwill is one asset, while “trained and assembled workforce” is taken into account in the asset “going concern”. This difference is easily explained. The fact is that financial accounting is not intended for use in decision-making. Management accounting, including accounts on IA, exists for these purposes. Valuation is needed for management purposes rather than for financial reporting. The problem is that valuation is also needed for financial reporting.

### **3.2.3. Hierarchy of valuation standards**

Currently a definite hierarchy of standards of professional activity has been established. Insofar as the holders of money - the most liquid form of capital - are investors, it is they who set the tone in the standards “market”. The standards of financial reporting are adapted to their requirements, and standards of valuation must adapt to the standards of financial reporting. This is the path taken by the development of international valuation standards adopted by IASC. As a result a situation is being created where the TEGoVA 2002 standards, which are more advanced and more closely correspond to the goals of valuation activity, cannot compete with international

valuation standards. At the same time, guidance note No. 4 on intangible assets to the international valuation standard corresponds neither to the IA concept nor to practical requirements, as was mentioned above. Moreover, the contradiction which has arisen cannot be resolved within the professional community of valuers, for at least two reasons, each of which is sufficient. Firstly, there are too few specialists among professional valuers who properly understand the problem, including the legal subtleties and the presence of contradictions of a fundamental nature. They will always constitute a minority, including in the ruling bodies of self-regulating organizations. Secondly, valuation standards must be adapted to standards of financial reporting. This is no longer an internal problem of the community, but an external requirement.

### **3.3. The intellectual property regime and the protection of rights**

The IP regime comprises legislation on IP, and also institutions which ensure the effective application of this legislation, including the effective protection of exclusive rights in the event of their violation.

#### **3.3.1. Dependence of market capitalization on the effective protection of IP**

There is a fairly obvious link between the effective protection of IP, on the one hand, and the market capitalization or market value of knowledge-based companies on the other. In the first place this relates to companies whose business is linked to the production of software, printed output, and also audio, video and cinema production. For such companies the key question is effective protection from unauthorized copying of their output, and the issue is becoming more acute as copying technology and telecommunications develop.

A valuation of the harm caused to such companies by the violators of copyright and neighbouring rights (pirates) is needed not only in order to understand the scale of the problem but also to underpin court cases. In a few countries, for example Russia, the problem of valuation of harm is very acute. In order to obtain a guilty verdict and punish pirates, the prosecution must demonstrate the existence of harm on a large scale. However, to link the actions of a specific pirate with the losses borne by the victim is very difficult.

If the problem is approached from a strictly scientific point of view, the economic aspects of the problem of violation of exclusive rights and efforts to combat it may most conveniently be studied through the example of the sound recording industry. There are several reasons for this. Firstly, the International Federation of the Phonographic Industry (IFPI) continuously collects and analyses information on the state of the industry, and publishes data on the scale of violations of copyright in various countries. Secondly, the main output of the sound recording industry - music albums - is fairly homogeneous. Essentially they are issued on compact discs. The albums manufactured in breach of copyright virtually do not differ in quality from lawfully manufactured albums with similar content. Lastly, the violations themselves are relatively homogeneous. Essentially they involve the manufacture and sale of music albums on compact discs without the permission of the holders of exclusive copyright to the works being performed and neighbouring rights to the recording (phonogram). This last very significant condition (homogeneity of violations) ceased to be fulfilled only with the growth of the Internet and the

appearance of the MP3 standard. Violations of copyright in the field of video were more heterogeneous from the very beginning. For example, in this field enormous harm is caused by what are known as “ragged copies” of films (copies recorded from the screen during showings in competitions). However, quantifying this damage is extremely difficult. Matters are even more complex in the field of software. Here the areas of application and the categories of consumer are very diverse. Consequently simple approaches are inadequate to say the least.

### **3.3.2. Transaction costs in the protection of exclusive rights**

Analysis of the practice of the courts shows that the balance between the transaction costs of law enforcement bodies during judicial prosecution of pirates, on the one hand, and those borne by pirates in organizing illegal business on the other, is changing in favour of the pirates. This is an objective obstacle to effective efforts to combat piracy. According to estimates by specialists from the Russian Ministry of the Interior’s Investigating Committee who have practical experience in this field, the investigation of a single case of piracy demands time and resources comparable with the cost of investigating three murders. Such a high price throws doubt not only on the possibility of fully eradicating the phenomenon of piracy, but also on the desirability of expending efforts and resources on attempts to combat it. It is essential to reduce the costs of investigation and the judicial system.

The most radical solutions aimed at reducing transaction costs in the prosecution of pirates are contained in a law adopted in 1998 in the United States and known as the Digital Millennium Copyright Act. In particular, this law extends legal protection not only to copyright performances but also to the technical facilities used in their protection, prohibits the use of certain types of technology, etc. However contentious such solutions are, in diverging far from the idea of copyright, it seems that there is no real alternative to them.

An additional means of lowering transaction costs in prosecuting pirates is the simplification of procedures when counterfeit products are seized and declared to be counterfeit and the harm caused is assessed. Comparison of practice in France and in Russia clearly shows that difficulties in combating piracy in Russia are largely the result of the fact that the process is overcomplicated. Measures to combat piracy can be made speedier and more reliable by standardizing the rules for determining harm suffered by the holders of the rights as a result of violations.

### **3.3.3. Lowering transaction costs by standardizing procedures**

The difficulty in standardizing the rules for assessing the harm caused by pirates does not arise from the absence of calculation methods. Sound recording companies and organizations fighting piracy propose an adequate number of very simple and understandable calculation methods. They are all based on the assumption that each unit of a pirated product (for example, a pirated copy of a music album) displaces from the market a unit of a similar product which has been manufactured lawfully. Bearing in mind that the pirated product costs a fraction of the price of the original and is practically no different in quality, this assumption is equivalent to assuming that demand for the product in question is inelastic. In this way, the question of the uniform application of standard principles applicable by companies in assessing the harm they have suffered is directly linked to the question of the elasticity of demand for their products.

Analysis of data published by IFPI (The recording industry in numbers 1996-1999), using simple mathematical models (Kozyrev A. 2000), shows that the assumption of the inelasticity of demand for music albums does not contradict the factual data, if this demand is considered on a large scale (at the country level). In other words, the average consumer of audio products who has access to a CD player consumes roughly four new music albums per year. In countries with a high level of audio piracy, two or three of these four albums are pirated; in countries with a low level of piracy, all four albums are legal. Consequently, one may expect that in the complete absence of cheap pirated products, consumer spending on acquiring new albums will increase, and demand for them will not fall.

Of course, a similar approach cannot be applied to software. First of all, software is too heterogeneous in its purpose, complexity, price, etc. One can identify types of program for which demand cannot be elastic. For example, operating systems fall in this category. An operating system must be installed in every computer, however much it may cost. The situation is less clear in relation to various utilities. And it is quite obvious that there are a huge number of programs which people buy in pirated form only because these programs form part of a package recorded on one CD. Bearing in mind the importance of efforts to combat piracy in the field of software, on the one hand, and society's very ambiguous attitude to it on the other, this problem must be studied with great care, including at the international level. If not, there is a risk of a negative reaction in society to the actions of anti-piracy organizations and the courts. Very telling in this regard is the example of the arrest of the Russian programmer Dmitry Sklyarov in the United States. Many Russian software manufacturers, considering the Digital Millennium Copyright Act a very progressive law, did not wish to speak of this publicly, fearing a negative reaction from society (not the authorities!). In order to avert situations where the decisions of courts in some countries are perceived with hostility by the public in other countries, it is desirable to draw up international principles for assessment of harm. In this case the negative reaction, if there is one, cannot be so severe.

### **Conclusions**

1. There is a definite gulf between theoretical investigations in the field of the knowledge economy, some of which are very profound, and the investigations of practitioners from the IC movement. The latter throw doubt on the applicability of certain fundamental theoretical propositions, including the Modigliani-Miller theorem and the law of conservation of value. At the same time, the practitioners do not notice the fundamental algebraic properties of knowledge and information which are well known in the theory, and do not see the unavoidable contradictions in market institutions.
2. In order to overcome the contradictions between valuation standards constructed on the basis of the IC approach and the standards of financial reporting, there is a need for joint efforts by the scientific community, practitioners of IC valuation and associations of investors with an interest in more adequate reflection of the value of companies in reports. This problem cannot be solved by a handful of valuers alone.

3. There is a need to develop simple principles for the valuation of harm caused by piracy in the sphere of sound recording, software production, the cinema, etc., which will be recognized by authoritative international organizations. The existence of such principles will make it possible to raise the effectiveness of efforts to combat piracy in the former socialist countries.

### Notes

<sup>1</sup> Griliches Z. 1990.

<sup>2</sup> Not applicable to English version.

<sup>3</sup> In addition to the “going concern” factor, unidentified assets include goodwill.

<sup>4</sup> Griliches used the term “stock market value”, not “market capitalization”.

<sup>5</sup> Nobel economics laureates in 1990.

<sup>6</sup> This view is disputed by the proponents of the direct intellectual capital (DIC) method.

<sup>7</sup> Not applicable to English version.

<sup>8</sup> But they do not provide very good guidance, as different authors cite contradictory data.

<sup>9</sup> When valuing investment projects the zero term of the discounted cash flow is generally negative. In examples of calculation of the value of IP rights given in textbooks, it is usually equal to zero.

<sup>10</sup> Not applicable to English version.

<sup>11</sup> European Valuation Standards/The European Group of Valuers’ Associations. The Estate Gazette, 2000 - 460 p.

<sup>12</sup> In the Russian Federation information resources are considered as material objects under the Information, Computerization and Protection of Information Act and consequently must be recorded not as intangible assets but as fixed capital.

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