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## **ANALITICAL MEASURES USED IN INTELLECTUAL CAPITAL VALUING**

*The article discusses the use of various methods of evaluating the intellectual capital of companies, provides a comparative description of their main advantages and disadvantages, as well as recommendations on their applying for the most efficient use of intellectual capital in order to achieve strategic goals and increase the value of companies.*

**Keywords:** *valuation, intangible assets, intellectual capital, performance, value-based management*

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## **АНАЛИТИЧЕСКИЕ МЕТОДЫ ОЦЕНКИ ИНТЕЛЛЕКТУАЛЬНОГО КАПИТАЛА**

*В статье рассматриваются вопросы применения различных методов оценки интеллектуального капитала компаний, дается сравнительная характеристика их основных преимуществ и недостатков, а также рекомендации по их применению для наиболее эффективного использования интеллектуального капитала для достижения стратегических целей и повышения стоимости компаний.*

**Ключевые слова:** *оценка, нематериальные активы, интеллектуальной капитал, эффективность; управление, направленное на создание стоимости*

In the most ordinary and unsophisticated way definition of intellectual capital (IC) can be given as set of knowledge that can be turned into company's earnings. In accordance with the accounting approach intellectual capital can be described pretty similar to the definition of intangible assets as non-monetary assets without physical substance that are:

- identifiable, controlled by a company as a result of past events;
- held for use in the production or supply of goods or services, for rentals to others or for administrative purposes;
- from which future economic benefits are expected to flow to the company.

For the purposes of valuing of intellectual capital it is crucial to understand the nature of different components that form company intellectual capital. Hubert Saint-Onge model as one of the most popular models for identifying and classifying intellectual capital components divides intellectual capital into three main parts: human capital, structural capital and customer capital.

Human capital includes the knowledge, competencies, experience, skills, creativity, innovativeness and talents of personnel within a company and is often treated as one of the most important intellectual capital component of a company.

Structural capital can be described as company supporting and infrastructure resources and consists of the company organizational processes and learning capacity, databases and software, patents, copyrights, design rights, production and sales secrets, trademarks, franchises and mineral rights.

Relational capital includes not only customer relations but also the company's external relationships with its network of suppliers, as well as its network of strategic partners and stakeholders. The value of such assets is mainly influenced by the company's reputation.

Measuring relational capital, the challenge remains in quantifying the strength and loyalty of customer satisfaction, longevity, and price sensitivity.

Prior to going into the issues and problems surrounding the measurement and reporting of intellectual capital, we need to find out why companies want to value IC. Young, knowledge-intensive companies face the problem of attracting external financing and need to develop methods to quantify their intellectual capital for dealing with investors and lenders. There a number of reasons why companies want to measure IC and the main reasons are connected with strategic or internal management purposes. Such reasons include:

- linking of intellectual capital resources with company strategic vision;
- supporting or maintaining various parties' awareness of the company;
- influencing overall value of a company as well as it's stock prices, by making company intellectual capital visible to current and potential investors;
- measuring effectiveness of a company's intellectual capital usage.

The growing interest in intellectual capital has led to the development of three broad analytical measures (methods) which are used in its valuation:

- market-to-book ratios;
- Tobin's Q;
- calculated intangible value (CIV).

#### *Market-to-book values.*

The value of intellectual capital is commonly expressed as the variance between the market value of the company and its book value. People are recognising the growing divergence occurring in the marketplace between the book value and the market capital of various companies.

The growing disparity between market value (MV) and book value (BV) is largely based on the intangibles of the business providing the base for future growth. The largest disparity occurs in high-tech and knowledge-intensive industries, where investment is heavily weighted in intangible assets such as R&D and brands.

From an internal perspective, differences between MV and BV are due primarily to assets that are not currently included in the traditional balance sheet total, such as knowledge, relationships, and image. The external perspective on the gap between MV and BV is due primarily to the company's future opportunities and these are currently not valued in the traditional balance sheet.

Market-to-book ratios have both theoretical and practical problems. First, the stock market is volatile and responds, often strongly, to factors entirely outside the control of management. Stock market price data are a highly volatile series, which can often be dominated by irregular, seasonal and cyclical factors. Furthermore, market-to-book values ignore exogenous factors that can influence MV, such as deregulation, supply conditions, general market nervousness, as well as the various other types of information that determine investors' perceptions of the income generating potential of the firm, such as industrial policies in foreign markets, media and political influences.

Companies with large intangible values tend to have share prices that fluctuate more than other companies. In a publicly traded company, the greater the ratio of intangible to book value, the more uncertain the investment, as witnessed by recent falls in technology stocks.

Second, there is evidence that both MV and BV are usually understated. To encourage companies to invest in new equipment taxation rules deliberately permit companies to depreciate assets faster than the rate at which they actually wear out. Calculations of IC that use the difference between market and book values can also suffer from inaccuracy because book values can be impacted if firms choose to, or are required to, adopt tax depreciation rates for accounting purposes.

Third, adopting the market-to-book approach for valuing intangibles suffers from timing inconsistencies because market value is determined and revised constantly whereas book values are only updated periodically.

The reliability and usefulness of the difference between MV and BV can be enhanced by looking at the ratio between the two, rather than at the raw number. One can then compare a company with similar competitors or benchmarked against the industry average and also make year-to-year comparisons of the ratios. While the market-to-book method of valuing IC is subject to several problems, it has served to draw attention to the undeniable existence of IC, and for that reason alone has been a constructive innovation.

Traditionally, *Tobin's Q* was used as a method for predicting investment behaviour. Tobin's Q compares the market value of a company with the replacement cost of its assets. It uses the ratio (the "Q") to predict the investment decisions of the firm, independent of macroeconomic conditions such as interest rates. The replacement cost of fixed assets can be determined as the reported value of a company's fixed assets plus the accumulated depreciation and adjusted for inflation.

As with market-to-book ratios, Tobin's Q is most revealing when similar companies are compared over a period of several years. Use of both Tobin's Q and the market-to-book ratio are best suited to making comparisons of the value of intangible assets of firms within the same industry, serving the same markets, that have similar types of fixed assets. These ratios are useful for comparing the changes in the value of IC over a number of years. When both the "Q" and the market-to-book ratio of a company are falling over time, it is a good indicator that the intangible assets of the company are depreciating. This may provide a signal to investors that a particular company is not managing its intangible assets effectively and may cause them to adjust their investment portfolios towards companies with growing or stable "Q's". An advantage of Tobin's Q over the market-to-book ratios, is that the Tobin's Q approach neutralizes the effects of different depreciation policies.

Tobin's Q can be a useful measure of intellectual capital because it can reflect the value markets place on assets which are not typically reported in traditional balance sheet. By making intraindustry comparisons between a company's primary competitors, these indicators can act as performance benchmarks that can be used to improve the internal management or corporate strategy of the company. The information provided by these ratios is used in internal benchmarking enabling the company to track its progress in the area that it has defined as being integral to its success.

*Calculated intangible value* allows to determine a monetary value of intangible assets. This method allows us to calculate the fair value of the intangible asset. Calculated intangible value computes the value of intangible assets by comparing the company's performance with an average competitor that has similar tangible assets. An advantage of the CIV approach is that it allows company-to-company comparisons using audited financial data and can be used as a tool for benchmarking.

Determining CIV:

1. Determine average pre-tax earnings.
2. Determine average year-end tangible asset (from balance sheet).
3. Return on assets (ROA) is calculated as average pre-tax earnings/average year-end tangible assets.

4. Compare the ROA against the industry's average ROA. If a company's ROA > Industry ROA proceed to step 5.

5. Excess return = Pre-tax earnings – [industry – average ROA \* company's average tangible assets].

6.  $(1 - t) * \text{excess return} = \text{premium attributable to IA}$  (where  $t$  = average income tax rate and IA= intangible assets).

7. CIV = premium/company's cost of capital.

Limitations of CIV method. First, the CIV uses average industry ROA as a basis for determining excess returns. By nature, average values suffer from outside problems and could result in excessively high or low ROA.

Secondly, the NPV of intangible assets will depend on the company's cost of capital. However, for comparability within and between industries, the industry average cost of capital should be used as a proxy for the discount rate in the NPV calculation. Again the problem of averages emerges and one must be careful in calculating an average that has been adjusted for outliers.

Additional approach used in valuation of intellectual capital is *Real options-based approach*. Over the past twenty years, there has been a growing body of academic research that has taken the theory and methodology of financial options and applied it to the valuation of intangible assets. This is known as real option theory, an extension of financial option theory. An option is the right, but not the obligation to buy (or sell) an underlying asset at some fixed price for a predetermined period of time. A real option is an option that is based on non-financial assets. It applies the same techniques and variables as the Black-Scholes model on which financial options are based, but uses non-financial inputs. Real options can be applied by using nonnumeric strategy options to determine the value to proceed, defer, expand or abandon investment. By drawing on financial markets' techniques, benchmarks, and information, businesses can discipline their investment decisions and align them with the investment decisions of the market. They can close the gap between strategy and shareholder value.

Reporting intellectual capital is often criticized by accounting professionals for the high uncertainty associated with the returns on intellectual assets. Intellectual capital by its very nature, derives its value from the opportunities it creates. Unlike the previous measures of IC – market-to-book value, Tobin's Q, and CIV – real options (option pricing models) provides an approach which values the opportunities arising from IC. Deciding how much to spend on R&D or the kind of R&D in which to invest, translates to the valuation of opportunities. Companies with new technologies, product, development ideas, defensible positions in fast-growing markets, or access to potential new markets own valuable opportunities. For some companies, opportunities are the most valuable things they own and the question is how do we map the opportunity to reality. The analysis of real options is more than simply a valuation tool. It is also a formal strategic tool, offering a proactive rather than just reactive flexibility.

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