

APPLICATION OF INTELLECTUAL CAPITAL FINANCIAL VALUATION METHODS UNDER CONDITIONS OF ECONOMIC RECESSION

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Abstract

Intellectual capital measurement, as a problem of management research, is investigated for third decade already. Intellectual capital measurement methodology is still not well-established neither in management literature nor in business practice. Intellectual capital financial valuation methods are generally based on the data of financial accounting, stock market information and various economic indicators. These methods are often positively assessed for the ease of their application, for the reference to objective and easy obtainable information, as well as universally perceived resulting information. However, they are more applicable under the stable economic circumstances. Lots of barriers arise, complicating applicability of these methods in practice and distorting interpretation of valuation results under the extreme economic fluctuation and especially during the deep recession.

The main objective of this research is to reveal problems and difficulties, complicating application of the intellectual capital financial valuation methods under conditions of economic recession.

The nature and methodological features of intellectual capital financial valuation methods are analyzed, and their merits and demerits are highlighted in this paper first of all. The prevailing tendencies of micro- and macro-economic changes and their influence on the applicability of intellectual capital financial valuation methods are explored afterwards. The main findings and conclusions of this paper are based on the positivistic methodological approach.

Keywords: intellectual capital, financial valuation methods, economic recession.

JEL Classification: G01, M49, O16.

Introduction

Issues of intellectual capital (further IC) and its impact on business performance are widely investigated in the IC theory since 1990s. IC measurement and reporting have been identified as those of the most importance for today's business success. It is widely accepted that effective management of IC is a reason for the growth and stability of organization's value creation. However because of the restrictions of financial accountability and legal regulation this kind of resources is often left outside the traditional organizational reports.

Over the last decade managers, investors, creditors and other stakeholders have recognized importance of IC measurement and reporting. These issues are emphasized within the research of almost all IC theory gurus (Sveiby, 1997; Edvinsson & Malone, 1997; Stewart, 1998; Sullivan *et al.*, 2000; Bontis, 2001; Andriessen, 2004; Roos *et al.*, 2005; Mouritsen, 2009; and others). Issues of intellectual capital definition and structure are still being researched in the IC theory from the evolutionary point of view (Choong, 2008; Tan *et al.*, 2008; Vlismas *et al.*, 2011). The impact of IC management and reporting on organization's performance is explored quite actively up to now (Alwert *et al.*, 2009; Moeller, 2009; Boujelben & Fedhila, 2011; Maditinos *et al.*, 2011). Examples from different industries and regions are discussed trying to find out some tendencies and set up kind of the best practice of IC measurement and reporting (Yi and Davey, 2010; Diez *et al.*, 2010; Rashid *et al.*, 2012; Mehralian, 2012).

IC measurement has been one of the hottest topics within the IC theory for a long time, but despite that lots of unanswered questions are still being left. It is still discussed if it is necessary to measure IC in order to make management decisions (Dumay, 2009; Ousama *et al.*, 2011; Dumay & Rooney, 2011). Comparative analysis of different IC measurement methods is still being performed (Bontis, 2001; Van den Berg, 2003; Andriessen, 2004; Vaskeliene, 2006, 2007). Quantitative research approach versus qualitative as well as IC measurement for the internal and external purposes within the organizational IC measurement research are analysed (Vaskeliene, 2007; Užienė, 2010). Lots of critical assessments of intellectual capital measurement methods in scientific literature can be found. Commonly authors attempt to penetrate their strengths and weaknesses or try to find out the limits of their application. Despite that the essence and utility of quantitative and qualitative, financial and non-financial, perspective and retrospective IC measurement methods are still under discussion.

Most commonly intellectual capital measurement methods fall under the heading financial or non-financial. The logic and techniques of financial methods are generally based on the data of financial

accounting, stock market information and various economic indicators. Most commonly they are called financial valuation methods. These methods are quite popular among the accounting community. Authors analyzing them (Stewart, 1994; Stewart, 1998; Sveiby, 1997; Luthy, 1998; Reilly & Schweih, 1999; Standfield, 2002; Van den Berg, 2003; Rodov & Leliaert, 2002; Lev & Zarowin, 2003; Pulic, 2004) focus on different management problems and have different measurement scopes. Resulting information of these methods is very precise, usually expressed as one indicator providing particular rating among other organizations and based on retrospective data.

Intellectual capital non-financial measurement methods represent different measurement techniques, designed on the base of performance measurement and strategic management platforms. Usually they are designed as a set of comparative indicators, oriented in to the qualitative problem solving character and diversiform resulting information.

Thorough analysis of the critique of financial and non-financial methods within the IC theory reveals lots of pros and cons for either group of methods. Financial valuation methods are often positively assessed for the ease of their application, for the reference to objective and easy obtainable information, as well as universally perceived resulting information. Non-financial measurement methods are positively assessed for the rich qualitative resulting information useful for management decisions. But frequently they are criticized for their complicated, time and effort intensive application in practice.

However, whether the intellectual capital financial valuation methods are applicable during all the stages of economic development? How differ possibilities of their application under conditions of global economic recession? What influence does the stock market crisis make on their application? How the application of these methods is influenced by the decline of organizations financial performance as well as the declining macro-economic indicators? The answers to these questions, conditioned by the global economic recession, are investigated further.

The following question outlines the key problem of this paper: “*What influence the global economic recession makes on the applicability of intellectual capital financial valuation methods?*” The main objective of this research is to reveal problems and difficulties, complicating application of the intellectual capital financial valuation methods under conditions of economic recession.

It is achieved by analyzing the nature and methodological features of intellectual capital financial valuation methods first of all. The prevailing tendencies of micro- and macro-economic changes and their influence on the applicability of IC financial valuation methods are explored later. The research is based on the theoretical debate within the Lithuanian and foreign papers on the critical aspects of financial valuation methods. Macroeconomic indicators are described while analyzing outcomes of economic recession. The main findings and conclusions of this paper are based on the positivistic methodological approach.

Intellectual capital financial valuation methods

Different financial valuation methods are applied for IC measurement and management in scientific research. Table 1 provides an overview of them.

Comparative analysis of the IC valuation methods reveals that half of them are created under the influence of the Finance theory. The rest come from the IC theory. The methods focus on different problems, but mostly are intended for external valuation purpose. Most of them attempt to cover all types of intangible resources. Sometimes they reflect the whole value of organizational resource tangible assets included. Commonly they are based on the retrospective information. Most of them use monetary measures and deliver one single result indicator. The state and the flow valuation techniques are nearly of the same frequency among them.

The logic and techniques of IC financial valuation methods are generally based on the data of financial accounting and various forms of their application. The most popular approaches used within these methods are income and cost valuation. Calculation of normalized earnings based on some years of historical data, their forecasts and present value estimation are the most popular techniques among these methods (*Calculated intangible Value, Options, Intangibles Scoreboard, etc.*). Often income approach comes in use along with the cost approach with a purpose to calculate residual value of income and compare it with the return of other companies (*Calculated intangible Value, Economic Value Added, Value-Added Intellectual Coefficient, etc.*). These methods are often positively assessed for the ease of their application, for the reference to objective and easy obtainable data, as well as universally perceived resulting information. But at the same time they face some difficulties related to the forecast of income and present value calculation under economic fluctuation. Sometimes they are criticised for the unsolved problems of synergy ignorance between tangible and intangible assets and the difficulties to funnel a part of earnings to each of the capital types.

Table 1. IC financial valuation methods

Method	Author (year)	Derivation paradigm	Problem solved	IC coverage	Data used on a time scale	Measures	Number of indicators	Valuation technique
Calculated Intangible Value	Stewrt, 1997; Luthy, 1998	Finance theory	External valuation	Full	Retrospective	Monetary	1	Flow valuation
Economic Value Added	Stewart, 1994	Finance theory	External / Internal valuation	Full (tangible resource included)	Retrospective	Monetary	1	Flow valuation
Market-to-Book Ratio	Stewrt, Sveiby, Edvinsson, Malone, Roos, etc., 1997	Finance theory	External valuation	Full	Retrospective	Coefficient	1	State valuation
Tobin's Q	Tobin, 1981	Finance theory	External valuation	Full	Retrospective	Coefficient	1	State valuation
Options	Luerman, Pindyck, Dixit, 1998; Clare, Detore, 2000; Van den Berg, 2003	Finance theory	Internal valuation	Partial (projects)	Perspective	Monetary	1	Flow valuation
Intangibles Scoreboard	Lev, Gu, 1999	IC theory	External valuation	Full	Retrospective	Monetary	1, >1	Flow valuation
"i" Valuing Factor	Standfield, 2001	IC theory	Internal valuation	Partial (decisions risk)	Retrospective	Coefficient	1	Flow valuation
Value-Added Intellectual Coefficient	Pulic, 2000	IC theory	External valuation	Full (tangible resource included)	Retrospective	Coefficient	1	Flow / State valuation
Weightless Wealth Tool Kit	Andriessen, 2000	IC theory	External / Internal valuation	Full	Retrospective / Perspective	Monetary	1, >1	Flow valuation
Valuation Approaches (Income, Cost, Market)	Smith, Parr, 1994; Lee, 1996; Reilly, Schweih, 1998	Finance theory	External / Internal valuation	Full / Partial	Retrospective / Perspective	Monetary	1	Flow / State valuation

Some of methods analysed are based on the stock market information, company's market value calculation and its comparison with the book value or other indicators (*Market-to-Book Ratio*; *Tobin's Q*; *"i" Valuing Factor*). Within the IC theory, one can find the widespread statement that the difference between company's book value and its market value represents the IC or the intangibility of resources. But, according to Andriessen (2004), the subtracting market value and book value is not a good method to calculate the value of IC because it reminds comparing apples with oranges. Market value is based on the present stock market information, which is very unstable and can change a lot in a short time. Book value is a more stable indicator, which represents the difference between reported assets and liabilities, both of which are valued at historical costs. The residual between market value and book value can be claimed for different subjects, for example, business reputation, brand value or competitive position. Looking at the logic of the ratio, one can see that it changes when a change in accounting rules occurs, but that does not mean that the value of IC changes. Ratio of Tobin's Q neutralizes accounting problems related to depreciation policies

because it uses replacement costs instead of book value, however, the other problems associated with this ratio as measure of IC are still left unsolved. Nevertheless such methods are positively assessed for the ease of their application and valuation results expressed as one indicator providing particular rating among other organizations interpretation.

Different economic indicators are sometimes employed in the calculation of financial value of corporate IC. For example, an average industry's ROA (*Calculated intangible Value*). Such methods are often based on the assumption that the premium on a company's value is a result of its IC. This can be a premium in market value, a premium compared with normalized earnings, or a premium return on assets. The present value of the premium earnings after taxes when earnings are compared with the industry average ROA is calculated (*Calculated intangible Value*). But here we face problems, when we try to calculate the value of IC for a company that performs below industry average. In this case, this value is negative, but that can't be true. Some other problems can here occur, related to the finding of the right industry benchmarks and the difference of the calculation of book value between companies.

And finally within the IC theory one can find quite new and sophisticated IC measurement methods, based on the both financial and non-financial valuation techniques (*Weightless Wealth Tool Kit*). Such methods are always rich in their results interpretation, they commonly open the sense of space for decision making and provide possibilities of composite financial and non-financial valuation results interpretation. But at the same time they face lots of difficulties related to non-financial valuation techniques, such as huge amount of primary information necessary for calculation, time and effort intensive technique application, absence of the valuation results comparability, etc.

However, despite the shortcomings mentioned before, IC financial valuation techniques are quite popular within the IC theory and business practice. The main reasons for that are precise and comparable resulting information, easiness of valuation techniques application and quite wide acceptance of familiar calculation techniques within the accounting community.

Impact of economic recession

Commonly in economics, a recession is understood as a business cycle contraction or a general slowdown in economic activity. Different macroeconomic indicators such as GDP, employment, investment spending, household incomes, business profits and inflation during the period of recession fall, while others such as bankruptcies and the unemployment rate rise. If a recession becomes a sustained downturn and gets character of abnormally large increases in unemployment, bankruptcies, currency value fluctuations, falls in the availability of credits, leaded by price deflation, financial crises and bank failures, it progresses in to the economic depression.

The financial crisis which rocked the global economy during 2008 and 2009 is considered as the most devastating economic event since the great depression of the 1930s (Papademos, 2009). The after effects of the crisis are still being felt across the world, with the painful outcomes for economies of the USA, Europe, Asia and other regions. Financial crisis affected not only businesses and life of millions of people worldwide, but became as one of the hottest topics within the scientific management and economic research. According to the well-known financier George Soros (2008), it radically changed the view of the modern-day economic environment, reliability of the application of quantitative methods within the economic research as well as possibilities of forecasts and predictions in the instantly changing life and business surroundings. According to him, it's time to change our view on the global economic processes, realistically reappraise possibilities of statistical forecasts and prognoses, base decisions upon them reservedly and look for the new financial paradigms. So, the financial crisis of 2007-2008s induces reappraising of the application of financial valuation methods in economics research once again.

Outcomes of recessions usually affect not only the financial markets, but the entire economies. Researchers analysing attributes of recessions highlight different of them. Most commonly these attributes include declines in component measures of economic activity (GDP). The declining consumption, investment, government spendings and net export activity can be observed among them. These summary measures reflect underlying drivers such as employment levels and skills, household savings rates, corporate investment decisions, interest rates, demographics, and government policies. Recessions generally occur when there is a widespread drop in spending, often following an adverse supply shock or the bursting of an economic bubble. Most often economies slow down as credit tightened and international trade declined. Governments usually respond to recessions by adopting expansionary macroeconomic policies, such as increasing money supply or decreasing taxation.

But the main question of this research covers the influence factors, global economic recessions make on enterprise processes and performance measurement and thereby on the application and its results of the IC financial valuation methods. Summarizing recession outcomes according to the main question of this research, three categories of them is to be distinguished as it is shown in table 2.

Table 2. Recession outcomes important from the viewpoint of enterprise performance measurement

Outcomes related to		
financial markets	enterprise income received	enterprise cost experienced
<ul style="list-style-type: none"> • fluctuation of share prices influenced by volatility of financial markets and problems related with share price forecasts; • problems related with investment and financing decisions; • increased credit interest rates; • difficulties establishing prices of substitutes, etc. 	<ul style="list-style-type: none"> • instability of business partnership and production supply processes; • declined production demand and possibilities of markets expansion; • shrinking households consumption and difficulties forecasting their behaviour; • shrinking businesses and bankruptcies, etc. 	<ul style="list-style-type: none"> • increased cost of raw material, labour and other inflation related problems; • diverse business cost saving; • declined possibilities of attracting skilled employees and development of core competencies; • increased cost of capital; • declined subsidy and government support; • declined investment spending and its impact on strategy execution and innovation, etc.

These and unmentioned recession outcomes falling under the three categories concerning the financial markets, income received and cost experienced in different ways complicate applicability of the majority of IC financial valuation methods. How does these limitations look like and emerge?

Limitations of the application of intellectual capital financial valuation methods

Main limitations of the application of IC financial valuation methods are summarized in table 3. Limitations are directly influenced by three categories of recession outcomes.

Table 3. Limitations of the application of IC financial valuation methods caused by recession outcomes

		Limitations of methods application	Methods affected
Outcomes related to	financial markets	Raising difficulties in the use of market indicators (mostly share price or/and market value) caused by market volatility.	Market-to-Book Ratio, Tobin's Q, "i" Valuing Factor, Valuation Approaches (Market).
	enterprise income received	Raising difficulties in the use of average industry rates (mostly ROA and ROE) caused by their negative value and lost reflection of business potential.	Calculated Intangible Value, Economic Value Added, Options, Intangibles Scoreboard, Value-Added Intellectual Coefficient, Weightless Wealth Tool Kit, Valuation Approaches (Income).
	enterprise cost experienced	Raising difficulties in the use of cost indicators caused by reduction of enterprise spending and investment as well as interruption of strategies execution.	Calculated Intangible Value, Economic Value Added, Tobin's Q, Options, Intangibles Scoreboard, Value-Added Intellectual Coefficient, Weightless Wealth Tool Kit, Valuation Approaches (Cost).

Limitations caused by the factors of changing financial markets influence application of financial valuation methods most of all. The market approach is based on the economic principles of competition and equilibrium. These principles assert that in a free and unrestricted market, supply and demand factors will drive the prices to a point of equilibrium. These principles can be applied for the prices of any goods or shares traded in a market. Under the circumstances of economic recession market conditions are commonly affected by negative expectations, share prices often fall down and the possibility to perceive proper business or commodity value from market value calculation is normally lost. Even share prices of firms with growth opportunities sometimes fall to a minimum, but it doesn't mean that these businesses are of no value. Merely the financial valuation based on the popular market indicators, such as share prices or business market value, and the IC measurement based on it temporarily should not be used until the economic situation will get stabilized.

Some difficulties of the IC financial valuation methods arise related with temporarily decline of enterprise income received. Comparison of income received among different industry players is usually distorted under the circumstances of economic recession. Especially this is relevant among the regions with different levels of recession. Even income of successful firms during recession period falls to a minimum or they experience other temporal sales difficulties. For this reason the IC financial valuation based on the income calculation approach, income forecasts or capitalization don't show the real value of enterprise IC under the circumstances of economic recession.

The third group of limitations comes from the use of cost indicators. There is a kind of IC valuation methods based on the assumption that economic value of IC is equal to the cost needed to invest in and obtain it. The cost approach is quite appropriate to value resource when setting transfer prices or when estimating the amount of damages sustained by the resource owner in an infringement. But in the case of financial valuation of enterprise IC under the circumstances of economic recession it is not a reasonable way. Principles of substitution and price equilibrium under these circumstances are infringed. Enterprises most commonly reduce their spending and investment on intangible resource during recession period, but it doesn't mean that the value of this resource and it's potential to generate economic benefit can't increase. The duration over which the economic benefit is enjoyed and the risk associated with the expecting economic benefit is left not appraised when applying this approach as well. These methods are either criticised for the fact, that expenses are not always properly separated from assets within this approach. Commonly, not all the expenses, especially under the circumstances of economic recession, are expected to provide benefits beyond the accounting period, while assets is to be treated as a claim by the enterprise to an expected benefit.

Conclusion

The main objective of this research was to reveal difficulties, complicating the application of intellectual capital financial valuation methods under conditions of economic recession. The research revealed, that the main outcomes of economic recession important from the viewpoint of the application of IC financial valuation fall under the three categories. The first one is related with the volatility of financial market and raises difficulties concerning the use of share price, market value and other market indicators. The second one is related with enterprise income received and raises difficulties of the use of different average industry income rates. And the third category consolidates problems related with the use of cost indicators caused by declining enterprise expense.

Under the extreme economic fluctuation and especially during the deep recession mentioned outcomes complicate the applicability of financial techniques for IC measurement and destroy an objective interpretation of valuation results. Methods of the IC financial valuation, as well as other methods based on financial calculations, under the circumstances of economic recession should be applied reservedly. Qualitative measurement approach is to be treated as more appropriate in these circumstances.

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