

Intellectual Capital Measurement Models: Literature Review of Market Capitalization Methods (MCM)

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ABSTRACT: Measuring intellectual capital (IC) is one of the important factors for introducing and reporting it. This paper reviews the literature pertaining to the measuring of intellectual capital. There are four types for measuring IC. One of these categories is Market Capitalization Methods (MCM) and the techniques under this category will be explained. These models have surfaced in an attempt to measure IC and this paper aims to highlight their strengths, weaknesses and operationalization.

Keywords: Intellectual Capital, Measuring Methods of Intellectual Capital, Market Capitalization Methods (MCM)

INTRODUCTION

The increasing gap between book value and market value of many organizations has attracted attention towards surveying the value missing from financial statements (Maditinos *et al.*, 2011). Stewart (1991) adopted the term “intellectual capital” as a replacement for the accounting term “intangible assets”. Various scholars agreed that IC is the hidden value of organizations as they are not disclosed in the financial statement. IC leads firms to obtaining a competitive advantage (Edvinsson and Malone, 1997). IC is knowledge assets that include skills, know-how, talent, know-how, and relationships. Additionally, it is considered as the set of structural capital (database, patents, networks, etc.), human capital (knowledge and skills), and customer capital (relationship with suppliers and customers) (Stewart, 2001). Cohen (2001) introduced social capital (shared values, trust, and understanding) as another component of intellectual capital.

During the past two decades, finding ways for identifying, measuring and reporting intellectual capital have been under researched. The methods which are related with market value present the economic status about position of each company in the wider marketplace. In addition, the reliability of usefulness of these methods can be enhanced by comparing companies in the same industry. Therefore, the assumption in MCM category is that capital market will provide a useful estimate of the aggregate value of IC. This category as one of the models of measuring intellectual capital and its weaknesses and strengths is explained in this paper.

INTELLECTUAL CAPITAL MEASUREMENT MODELS

The methods of measuring intellectual capital have been developed and applied by organizations and researchers. However, it was posited by Kaplan (1996), that managing the intellectual capital of any organization require appropriate measurement; hence, the significance of managing organizational intellectual capital needs adequate measurement.

Williams (2001) classified IC measurement methods into four groupings which are as thus:

Direct Intellectual Capital methods (DIC)

in this model, the monetary value of intellectual capital is directly determined by identifying its components. They are separately recognized and utilized as indicators.

Market Capitalization Methods (MCM)

in this method, the difference between stockholder's equity and market capitalization of companies are calculated.

Return on Assets methods (ROA)

this approach compares the tangible assets of a company on an annual financial growth compared to the whole industrial average and utilized the average of earnings for estimating the value of intellectual capital.

SCORECARD METHODS

this technique reports in a graphical manner the various parts of intellectual capital or intangible assets. Firstly, all the methods of measuring intellectual capital are summarized in Fig I (Malhotra, 2003).

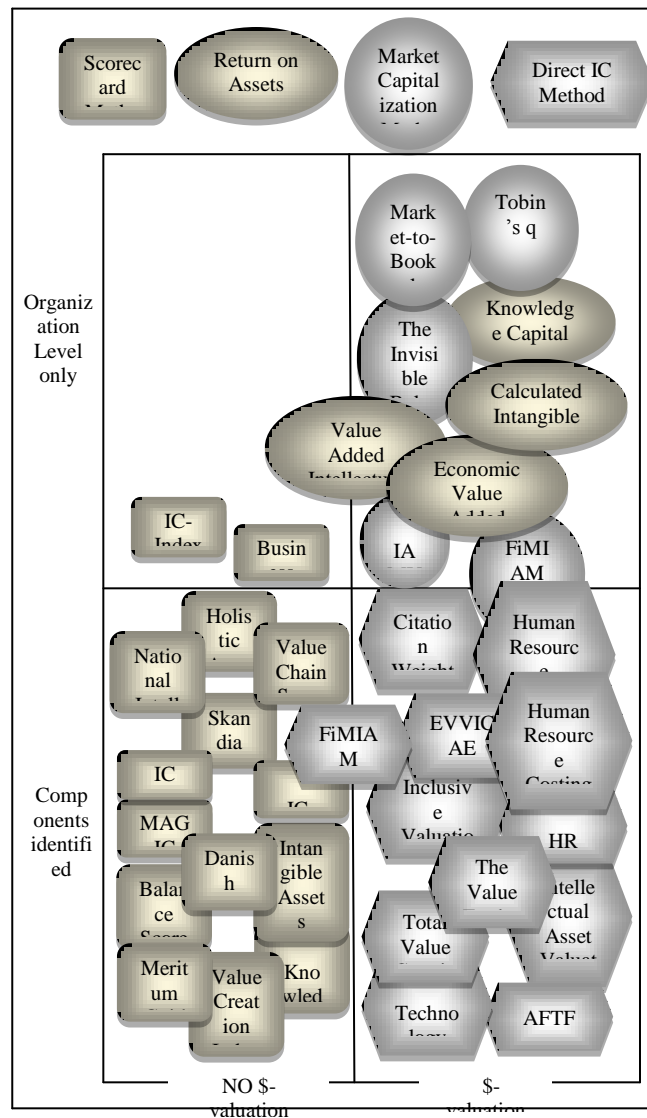


Figure 1. The classification of measuring method of intellectual capital

MARKET CAPITALIZATION METHODS (MCM)

Tobin's q

The assets replace value is contrasted with market value by Tobin's q ratio. Tobin (1969) presented Tobin's q ratio and argued that the capital investment in a company depends on the ratio which is between the current replacement cost of capital assets and their market valuation. Thereafter, the performance of firms is evaluated by Tobin's q and it is used as an indicator of intellectual capital. One of the applications of q is firms use it in deciding the type of assets to invest in. If the q ratio of firms is more than unity, it means that the market value of assets is more than their replacement cost, hence investing in these assets is considered suitable. As a result, it is better that the firms do not invest in that kind of assets, which have the q ratio less than unity (Nazari, 2010). Stewart (1997) stated that Tobin's q is a suitable indicator of IC but it is not considered as a measure of IC. A firm can have a suitable return of assets if it has a high q ratio, and this ratio indicates the position that firms can earn profit from their assets.

Bouteiller (2000) suggested the use of this ratio in comparing firms with their peers in the industry which have similar kinds of assets. This argument is supported by Bontis (1998), who stated that Tobin's q ratio as cross section of industries might be significantly different. For example, an average Tobin's q ratio in the software industry might be more than other industries because of their high degree of reliance on intellectual capital.

The Invisible Balance Sheet

The model presented by Konard Group is an extension of human resource costing and accounting method. The purpose of this method is to present the employees of organizations as critical assets in a more formative model than the traditional balance sheet.

Konard Group stated that in the knowledge based organization; IC is subdivided into structural and individual capital. Based on this method, structural capital is defined as processes, systems and routines in the firms, and it is further divided into two main components: the abilities of organizations and professional competencies (Nazari, 2010). Individual capital is described as skills, experiences, individual and public abilities and knowledge of the employees of the firms that is used in the organization to resolve individual problems (Sveiby, 1989). Level of education, investment in training, and average number of years on the job are indicators of individual capital, and the indicators of structural capital are investment in new competencies for a number of years in business, position of market and percentage of sales (Nazari, 2010).

The actual value of intellectual capital is not determined by some of the qualitative indicators of this method (Rodov and Leliaert, 2002). Andriessen (2004) stated that some of the indicators of individual capital such as skills and experience of employees can be considered as a subset of structural capital; therefore, this result to the criticism of the overlap between indicators of individual and structural capital. Additionally, the explanation of some of these indicators is difficult, and the best thing is that they should be used in other areas such as consult, sustainability of profit and or assessment of risks (Andriessen, 2004).

Market-to-Book Value Ratio

The difference between book value of the total assets that is presented in the balance sheet of firms and market value of the firm's shares is introduced as IC of a firm by many famous researchers in this field of study (Edvinsson, 2000). There is a broad consensus that organizations cannot calculate the value of intellectual capital through acceptable accounting methods (Nazari, 2010). Therefore, Chin (2005) posited that the value of IC can be measured through market-to-book value ratio as a logical method which attracted the attention of scholars in this area.

In addition, Stewart (1997) supported this method and stated that understanding and computing of this ratio is easy and quick. However, Reference (Mouritsen *et al.*, 2001a) argued that there are some problems in adopting this model.

The three main problems are described below:

The market is unstable and influenced by some factors that cannot be controlled by management. According to some guidelines, firms must use faster rate to depreciate their assets if there are better investment in new assets. Therefore, reporting the assets with book value in the balance sheet can be understated because the use of the faster rate leads to a faster depreciation than what is usually obtainable. Managers cannot recognize some results from applying this ratio.

Among the many important applications of market-to-book value ratio is the adoption in comparability (Nazari, 2010). Therefore, this ratio can be used for comparing the firms with their competitors and help managers

and other beneficiaries to know about the location of firms in the market over time (Stewart, 1997). As a result, the low level of the market-to-book value ratio can be indicated as a decreasing value of firms.

FIMIAM: Financial Method of Intangible Assets Measurement

Rodov and Leliaert (2002) developed FiMIAM and tried to associate the intellectual capital value with the difference between market value and the book value of the organization. According to IC literature, this model is comprised of three major components of IC: HC, SC, and RC.

In this model, there are six steps to measure the value of IC (Rodov and Leliaert, 2002).

Step1 Market value of IC is computed by subtracting the market value of firms from its book value.

Step2 The key components of intellectual capital which should have earnings for creating potentials are identified by analyzing data of historical financial and non-financial reports. The components of intellectual capital according to three-leaf model that are used in this method are presented in Figure II.

Step3 The key components of intellectual capital are allocated weights which represent the efficient percentage of each item on the overall intellectual capital value based on the previous experience of managements.

Step4 The valuable components of intellectual capital which have the most significant effect on the overall intellectual capital are determined.

Step5 Multiplying the weight of each intellectual capital components by the overall value of IC is used to determine their dollar value.

Step6 The market value of components of intellectual capital that are determined in the last step is added to the book value.

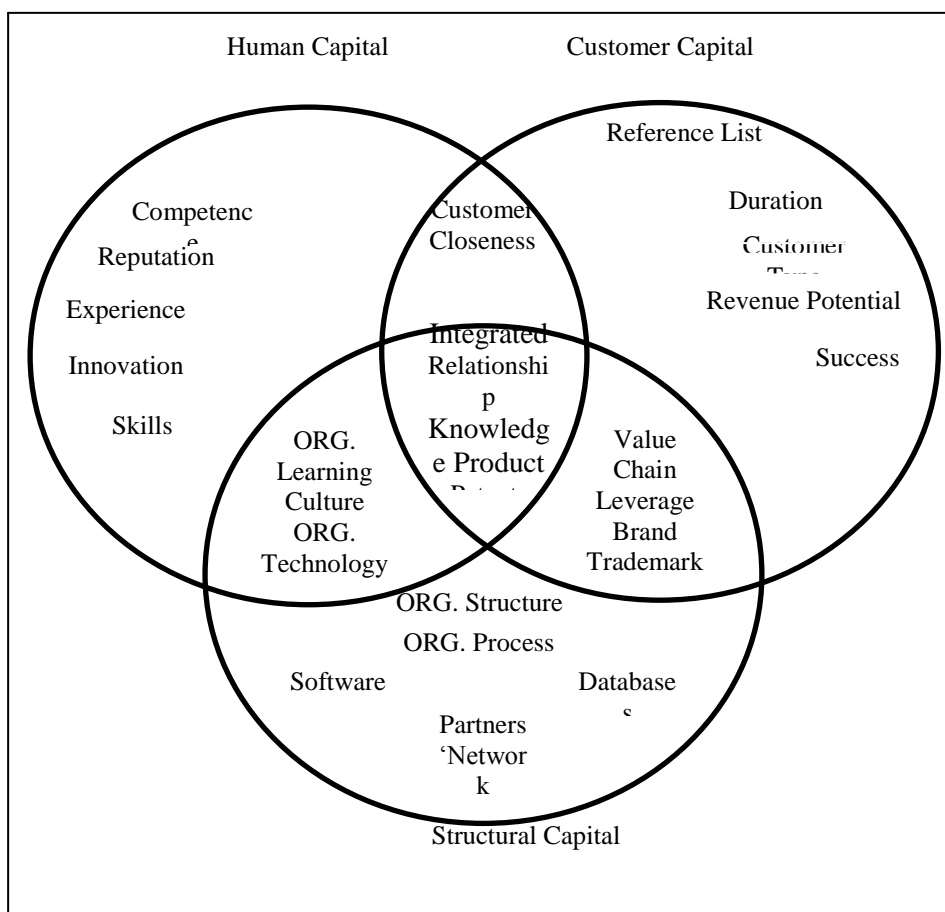


Figure 2. IC Components Clustered According to the Three-leaf Model

CONCLUSION

Generally, market value of firms is used for measuring intellectual capital in all of the methods mentioned. Intellectual capital or intangible assets are evaluated by the difference between the firm's market value and their book values. However market value is unstable and this is one of the weaknesses of these methods, but the assumption in this category is that market value will provide a useful estimate of the aggregate value of intellectual capital.

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