The implications of intellectual capital on performance measurement and corporate performance

Saudah Sofian
sausof@yahoo.com
Faculty of Management and Human Resource Development
Universiti Teknologi Malaysia

Mike Tayles
m.e.tayles@hull.ac.uk
Centre for International Accounting and Finance Research
University of Hull

Richard Pike
r.h.pike@bradford.ac.uk
School of Management
University of Bradford

Abstract

The traditional performance measures fail to capture and monitor multiple dimensions of performance; they concentrate almost only on financial aspects of the organizations. Intellectual capital (IC) gives rise to benefits that are hard to quantify, such as management, customer retention, R&D, and innovation. These benefits are not captured by the traditional measures. This suggests that they are not adequate for the current information age, which encompasses new business environment and realities. This paper examines the impact of the degree and form of IC on management accounting practices, specifically, performance measurement and corporate performance. We explore whether firms investing heavily on IC are more likely to emphasise non-financial measures. We also examine whether the degree of IC values in these firms influence their performance. The paper reports the results of a study conducted through a survey in over 100 large companies covering both high and low levels of IC. The study explored both the role of management accounting information and that of the management accountant. Results suggest some evolution in performance measurement approaches due to the impact of IC and they also indicate that IC does influence corporate performance.

Introduction

Knowledge and information are prime commodities in today's 'knowledge-economy' where economic enterprises are increasingly knowledge-based and technological driven (Davenport and Prusak, 1998). Knowledge firms have a large proportion of their investment in intangible assets and this poses a real challenge both for financial and managerial accounting that traditionally have not adequately reflected the investment and performance of intangibles in financial statements.

Increasingly, however, it is being recognised that intangible assets and intellectual capital are the keys to attaining competitive advantage for the knowledge firms (Segelod, 1998). Knowledge-based assets are the foundation for success in the 21st century. Wiig (1997) argues that knowledge and intellectual capital (IC) play a fundamental role within modern enterprises. Many leading organizations, such as Skandia Insurance and Ernst &Young, have successfully managed knowledge and intellectual capital.

Klein and Prusak (1994) define IC as "packaged useful knowledge". Sullivan (2000) suggests that IC basically constitutes knowledge, lore, ideas and innovations. Two major components of IC are human capital and intellectual assets. A clear distinction between these two forms relates to ownership - human capital cannot be owned by companies. However, firms can transform innovations produced through human capital into intellectual assets to which they have rights of ownership.

The IC literature in accounting mainly addresses external reporting (e.g. Bukh *et al*., 2001; Guthrie, 2000; and Mouritsen *et al*., 2001). Roslender and Fincham (2001) observe that there is very little academic literature on accounting for IC, while the practitioner oriented literature has become repetitive. This paper explores how firms with high levels of IC have developed their management accounting practices to address the issues that accounting for IC promotes.

This paper examines whether the degree and form of IC possessed within firms influences performance measurement. We offer findings on whether firms investing heavily in IC are more likely to emphasise non-financial measures, focusing more on the strategic, and less on the financial issues. We also examine whether such firms achieve higher performance levels.

The next section of this paper examines the relevant literature. We then describe the research method and data before analysing and discussing results.

Literature review

Intellectual capital (IC)

While earlier writers may not agree on the precise definition and shape of IC, there is broad consensus that it contains human capital, structural capital and relational capital (Stewart, 1991, 1997; Edvinsson and Sullivan, 1996; Edvinsson and Malone, 1997; Roos *et al*., 1997; Lynn, 1998; Bontis, 1998). Human capital captures the knowledge, professional skill and experience, and creativity of employees. Structural capital consists of innovation capital (intellectual assets such as patents) and process capital (organizational procedures and processes). Relational capital captures the knowledge of market channels, customer and supplier relationships, and governmental or industry networks. Figure I illustrates this.

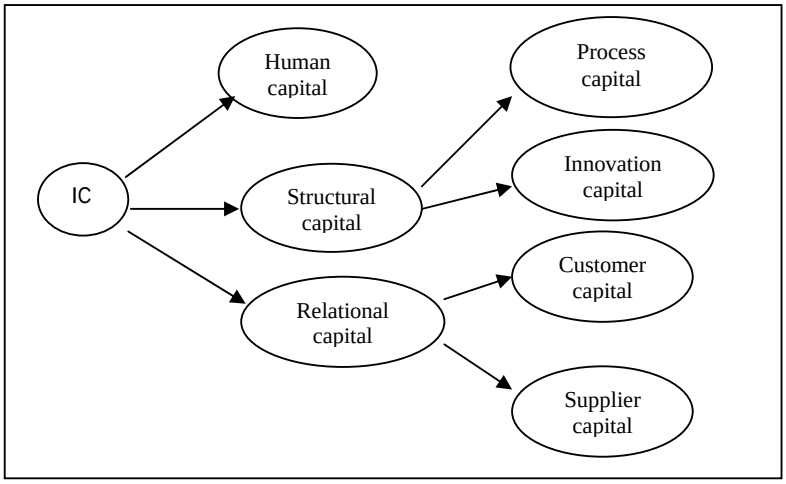

Figure 1: Division of IC

These elements are summed up in the following definition: "IC is the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organizations competitive advantage" (CIMA, 2001).

According to Edvinsson and Sullivan (1996), knowledge firms derive their profits from innovation and knowledge-intensive services. Such firms we termed as high IC firms. In contrast, low IC firms do not create and deploy knowledge intensively and value creation does not rely heavily on superior knowledge, structures and relationships.

Intellectual capital management (ICM) is defined as the direction of the value-driven transformation of human and relational capital into the structural capital of the organization (Lynn, 1998). Corporate processes (e.g., recruitment, training and compensation) help foster creativity and innovation. Together with appropriate technology and structural capital they create and share organizational knowledge which, when exploited and applied to external knowledge and relational capital, produces corporate competitive advantage.

The outputs of knowledge management (KM) are innovations or intellectual assets. Intellectual assets such as patents and trademarks are normally legalized in order to obtain legal, propriety rights upon them, producing intellectual property. Together with structural capital (technology, procedures, processes, etc.), tangible assets and relational capital, they are managed to create profitable new products and services. ICM therefore converts IC into intellectual assets, which, when commercialised increases corporate value (Edvinsson and Sullivan, 1996; Edvinsson and Malone, 1997; Roos *et al*., 1997).

Performance measurement

Simons (1990) observes that performance measurement is tracking the implementation of business strategy by comparing actual results against strategic goals and objectives. Neely (1998) suggests that performance measurement "is the process of quantifying

past action". Strategy is a pattern of resource allocation that enables a firm to maintain or improve performance that creates 'fitness' among a company's activities. Performance must be measured in order to analyse strategies, as performance is a result of an activity (Porter and Millar, 1985). Atkinson *et al*. (1995) regard performance measurement as the most important, yet most misunderstood and most difficult task in management accounting.

The traditional performance measures fail to measure and monitor multiple dimensions of performance; they concentrate almost only on financial aspects of the organizations. IC gives rise to benefits that are hard to quantify, such as management, customer retention, R&D, and innovation. This suggests that traditional financial measures are not adequate for the current information age, which encompasses new business environment and realities (Amaratunga *et al*., 2001).

The above is evidenced by the fact that corporate market values exceed book value. Amir and Lev (1996) estimated that nearly 40 per cent of the market valuations of the average companies are not shown in their balance sheets, and this is 50 per cent for high-technology firms. This of course depends on and varies with the state of the stock market. But it highlights the significance of intangibles in the reporting by and valuation of firms. Amaratunga *et al*. (2001) found that 70 per cent of investors based 30 per cent of their decisions on non-financial performance; and financial analysts concentrate more on the use of non-financial measures, as they get more accurate forecasts. Drucker (1992) stresses the dilemma:

> a traditional measure is not adequate for business evaluation. A primary reason why traditional measures fail to meet new business is that most measures are lagging indicators. The emphasis of accounting measures has been on historical statement of financial performance. They are the result of financial management performance, not the cause of it.

Global markets have shifted from capital-intensive industries to knowledge-based industries, which have much more intangible resources. Traditional financial measures fail to assess the performance of such companies with high intangible resources. The long-run value, which the companies such as Microsoft are based on, is their IC resources and their continuous innovativeness (Barsky and Bremser, 1999). The discrepancies between the market value and the book value that are shown by financial measures have led investors to seek primarily non-financial information (Amir and Lev, 1996).

Traditional performance measurement employs financial techniques (Usoff *et al*., 2002) such as Return on Assets and Return on Capital Employed. Such measures have been criticised for being backward looking (Bourne *et al*., 2000), unable to measure intangible resources (Amir and Lev, 1996) and not suitable for assessing performance of investments in new technologies and markets which firms require to compete successfully in global markets (Eccles, 1991).

In the early 1990s, balanced, multi-dimensional performance measurement models were developed, to overcome the weaknesses of financial measures (Bourne *et al*., 2000). Such models place greater focus on intangible resources (Amir and Lev, 1996) such as key customers, internal processes and learning, (Simons, 1990). Commonly

used models include Balanced Scorecard (Kaplan and Norton, 1996; Lipe and Salterio, 2000), Intangible Assets Monitor, and Skandia Navigator (Sveiby, 1997). For example, the Balanced Scorecard (BSC) considers relational capital (customer perspective), structural capital (innovation, learning, and internal perspectives) and the impact of IC on shareholder goals (financial perspective).

The above discussion on performance measurement leads us to suggest that firms with relatively high IC are more likely to employ non-financial measures, scorecard-type approaches involving balanced, multi-dimensional measurement, and value-based approaches linked to shareholder value such as EVA and requiring recognition of the intangibles within the asset base.

Influence of intangibles on corporate performance

Davenport and Prusak (1998) note that technological advances in data processing, communication, and transportation, as well as customer demand and strategists' planning have made the world economy change very fast. It has been the biggest wave of changes since the Industrial Revolution. The economy is dubbed 'knowledge-economy', as the prime commodities are knowledge and information (IC). Knowledge creates and leverages the intangible value of companies that is IC. Teese (2000) notes that with the growth of the knowledge-economy, the intangible assets of the firm and its IC are the keys to achieving sustainable competitive advantage. Drew (1999) suggests that intangibles (knowledge) drives economic growth.

We argue that high IC firms that adopt appropriate management control systems are more likely to perform highly in terms of industry leadership, competitiveness, and new product development. Superior performance on these dimensions should in the longer term be reflected in financial accounting and stock market performance measures. From the above we propose that companies with relatively high IC outperform low IC firms.

Research methodology

We seek to examine how management accounting practices found in large Malaysian firms vary with the level of IC and its mix, in terms of human, structural, and relational capital. We then ask whether this has any impact on corporate performance. The nature of the study is both exploratory and descriptive. Most prior research on IC, has applied questionnaire surveys for data collection (e.g. Bontis, 1998; Dooley, 2000; Lovero, 2000; Reeds 2000; Usoff *et al.*, 2002), this study likewise, uses a questionnaire.

The companies were randomly selected from the Kuala Lumpur Stock Exchange (KLSE) list. The high IC companies were drawn from four broad sectors, where IC is expected to be beneficial technology, consumer products, trading and services, and finance sectors. The low IC companies are from the other sectors. Survey questionnaires were mailed to accountants or financial managers in selected companies. Follow-ups were made through a second mailing and telephone calls. In total, 119 responses were received, a response of 35%.

Drawing on Bontis (1998), Reeds (2000) and Usoff *et al.* (2002), the questionnaire asked respondents to indicate their agreement (on a 1-7 scale) to a range of questions relating to their company's emphasis on IC. Of these, some 25 questions were used to construct variables for human (HIC), structural (SIC), and relational (RIC) capital. The questionnaire then asked respondents to indicate the degree of importance in their organisation (1-7 scale) of a range of performance measurement practices, drawing on prior work by Usoff *et al.* (2002). Finally, the questionnaire raised questions on performance measurement, based on the prior work of Bontis (1998). Tests for reliability, and response bias and analysis of descriptive statistics indicate that the responses used in this study meet the levels of reliability and validity required for meaningful further analysis.

Findings from the survey questionnaires were analysed using Spearman-Rho's Rank Correlation. Association between variables were identified.

Findings and discussion

Tables 1-3 report associations between the level of IC and performance measurement and the level of IC and corporate performance. Three IC variables are employed. The constructs are composite variables based on questions relating to human (HIC), structural (SIC), and relational (RIC) capital within the firm (see Appendix).

Financial performance and other performance measures

Table 1 considers the main financial performance measures employed by firms. High IC firms are seen to rely more heavily on Profitability as a performance measure than low IC firms. Moreover, Shareholder Value Analysis (SVA) is strongly associated with high levels of human, structural and relational capital, while Economic Value Added (EVA) is associated with structural capital. Both of these value-based approaches require appropriate recognition of the value of IC to operate effectively. We also observe that Target Profit is associated with a higher emphasis on IC. We conclude from these initial observations that firms investing heavily in IC tend to place greater emphasis on profitability, value-based, and target profit performance measures than firms with little IC investment. The appropriateness of such measures as reliable indicators of performance rests largely on the extent to which they incorporate the costs and benefits of IC.

Table 1: Correlation of IC and importance of financial performance measure

PERFORMANCE MEASUREMENT	**HIC**	**SIC**	**RIC**
Importance of:			
Sales	.146	.139	.168*
Profitability	.266**	.358**	.244**
EVA	.144	.302**	.161
Target profit	.381**	.341**	.443**
Shareholder value	.357**	.328**	.335**

Significance levels: * = .05, ** = .01, *** = .001

Table 2 examines whether firms with higher IC are more likely to reflect this in their performance measurement practices. We observed that IC level is strongly associated with having:

a) financial and non-financial performance measures,
b) performance measures which capture the IC contribution,
c) focus more on past performance rather than future success,
d) financial measures that properly account for corporate value, and
e) financial measures that provide an incentives for shareholder value.

Looking at the specific scorecard measurement systems used by the sample firms, we observed that their relevance is strongly associated with the degree of Structural IC in firms. In particular, the Balanced Scorecard approach is associated with all forms of IC.

Table 2: Correlation of IC with importance of measuring IC impact

	HIC	**SIC**	**RIC**
Performance measures includes both financial and non-financial measures	.435**	.485**	.544**
Performance measures capture IC contribution	.512**	.608**	.502**
Performance measures focus on future success	.096	.276**	.138
Performance measures focus on past performance	.370**	.409**	.395**
Financial measures properly account for all ways in which corporate value could be added or lost	.135	.258**	.346**
Financial measures provide management with an explicit incentive structure that creates value for shareholders	.316**	.356**	.439**
Non-financial measure:			
Balanced Scorecard	.325**	.534**	.353**

Significance levels: * = .05, ** = .01, *** = .001

Our second area of examination concerns whether there is evidence suggesting that firms with higher IC tend to achieve higher performance levels. Table 3 suggests that this is the case. We found positive association for at least one of the IC variables with industry leadership, future outlook, profit, profit growth, response to competition, successful new products, and overall business performance. It is clear that respondents in high IC firms gave a higher performance rating than respondents in low IC firms. However, we did not examine actual performance data (e.g., using secondary data sources). The results are in line with Nonaka and Takaechi (1995) and other authors, for example, Bontis (1998) and Teese (2000).

Table 3: Associations between business performance and IC

	HIC	SIC	RIC
Business Performance:			
Financial measures:			
Profit	.290**	.224**	.368**
Profit growth	.263**	.359**	.362**
Sales growth	.212*	.245**	.296**
After-tax return on assets	.143	.186**	.252**
Share prices	.117	.196*	.202*
After-tax return on sales	.129	.199**	.244**
Industry leadership	.237**	.285**	.350**
Non-financial measures:			
Future outlook	.377**	.416**	.442**
Overall response to competition	.388**	.414**	.506**
Success rate in new product launches	.438**	.441**	.486**
Overall business performance and success	.361**	.445**	.478**

Significance levels: * = .05, ** = .01, *** = .001

Conclusion

In this paper, we have examined the question of whether the level and form of intellectual capital within firms influence performance measurement and corporate performance. We have offered findings based on a sample of large Malaysian firms. Findings suggest that the level of investment in IC is associated with management accounting practices, business performance, and the ability to respond to future events. Further studies should explore the 'fit' between level of IC, appropriate management style, management accounting practices, and organisation context to ascertain whether firms with stronger fit enjoy higher corporate performance levels.

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Appendix: Summary of survey items (excerpts from questionnaire)

Human capital

H1	employees are bright and creative	H4	employees are experts in their respective areas
H2	get the most out of employees	H5	come up with new idea
H3	employees are required to share knowledge	H6	employees are able to focus on the quality of service provided

Structural capital

S1	systems allow easy info access	S6	develop most ideas in industry
S2	procedures support innovation.	S7	high annual information technology allocation
S3	systems require knowledge sharing	S8	documents knowledge in manuals, databases, etc.
S4	high investment in innovation.	S9	protects vital knowledge and information
S5	keeps track and makes full use of intellectual assets		

Relational capital

R1	customers are loyal	R6	meet with customers
R2	firm is market-oriented	R7	care what customers want
R3	firm is efficient	R8	good relationships with its suppliers
R4	understands targeted market	R9	devote considerable time to select suppliers
R5	feedback with customers	R10	maintain long-standing relationships with suppliers