

Intellectual Capital and Company Performance
– Literature Review and Research Opportunities in Australia

Sebastian Salicru

PTS Pty Ltd , Melbourne, VIC

DBA Candidate, Monash University, Victoria

Email: ss@pts.net.au

(corresponding author)

Dr Chris Perryer

UWA Business School, University of Western Australia, WA

Email: chris.perryer@uwa.edu.au

Associate Professor Phil Hancock

UWA Business School, University of Western Australia, WA

Email: phancock@biz.uwa.edu.au

This paper was presented at the 21st annual Australian and New Zealand Academy of Management Conference - ANZAM 2007 (Managing Our Intellectual and Social Capital), held in Sydney December 4-7, 2007

Stream: Stream 6 (Knowledge Management and Intellectual Capital)

Presenter Profile: Sebastian Salicru is a business psychologist with 15 years of consulting experience. He specialises in the areas of Intellectual and Human Capital Management, Workplace Creativity and Innovation, Organisational Learning and Development, Cultural Change and Leadership Development. He was a co-designer of the Business Creativity & Innovation Framework. Sebastian holds a Master of Science degree in Creativity from the State University of New York (SUNY) and is currently a Doctor of Business Administration (DBA) candidate at Monash University.

Intellectual Capital and Company Performance

– Literature Review and research opportunities in Australia

Abstract

Many scholars now argue that Intellectual Capital (IC) is more likely to be the key source of a firm's competitive advantage than tangible resources. Hence, leveraging knowledge is often the key to a firm's prosperity. Consistent with most first-world countries, but in a more accelerated fashion, Australia has experienced a major shift in its source of GDP: 73 per cent of the workforce is now employed in the knowledge and services sector and contributes 52 per cent to national GDP. This move away from traditional commodities, resources and manufacturing sectors towards a service and intangible-based value creation economy has made Australia a prominent leader in financial services, insurance products, software development, biotechnology and training and development. The empirical relationship between IC and financial performance has been investigated in various countries. However, Australian IC-related studies have not empirically investigated such relationships. Therefore, there is a need and an opportunity for the relationship between IC and financial returns of companies in Australia to be examined and thereby to take IC-related research in Australia to a new level of development.

Keywords: *Intellectual Capital, Intangible Assets, Human Capital, Social Capital, Structural Capital, Customer Capital*

The relationship between IC and financial performance has been investigated empirically in countries including Canada and USA (Bontis & Fitz-enz 2002; Riahi-Belkaoui 2003), China (Chen et al. 2004), Malaysia (Bontis et al. 2000; Chen 2005), Germany (Bollen et al. 2005), Singapore (Tan et al. 2007), Spain (Sáenz 2005) and Taiwan (Chen et al. 2005). To date, Australian IC-related research has been mostly descriptive in nature. It has focused on definitions or classifications, or has been of an anecdotal type (including case-based reviews). However, it appears that no attempt has been made to empirically link IC to company performance, as has been done in other parts of the world. This is rather concerning, as some Australian industries where intellectual capital is an important asset (e.g. financial services, insurance products, software development, biotechnology and training and development) have been acknowledged as international leaders in their field (Guthrie & Petty 2000). While at least one Australian company has been identified in a sample of a study conducted outside Australia (Bontis & Fitz-enz 2002), more research is needed to examine the linkages between IC and performance.

Intellectual Capital is a relatively new term and is part of the Knowledge Management (KM) trend that has impacted on the business world during the last two decades. Evidence of this trend includes the vast number of newly published IC & KM-related books, journals, newsletters and electronic media, new advisory and consulting services, IC-related corporate designated titles or positions and the focus on IC & KM-related conferences like this one.

The terms 'Intangibles', 'Knowledge Assets' and 'Intellectual Capital' are widely used in the accounting, economic, management and legal literature. Essentially, however, they all refer to the same concept - namely claims to future benefits that cannot be measured with sufficient reliability. When such claims are legally protected (as applies to patents, trademarks and copyrights), the assets are termed 'Intellectual Property' (Lev 2001).

The consequences of the emerging knowledge society and the growing interest in IC represent a major shift within the current economy and have been acknowledged by many authors (e.g. Drucker 1993; Fitz-enz 2000; Nelson & Winter 1982; Nonaka & Takeuchi 1995; Porter 1985). The fact that knowledge-based assets are increasingly becoming the main resource of organizations has also been documented extensively (Marr et al. 2002; Quinn 1992; Roos et al. 1997; Stewart 1997; Sveiby 1997, 2001; Toffler 1990). Further, many scholars now argue that IC (or intangible resources) is more likely than tangible resources to be the key source for many firms' competitive advantage and market dominance (Brennan & Connell 2000;

Boedker et al. 2005; Carlucci et al. 2004; Hanson et al. 2002; Hitt et al. 2001; Marr 2004; Viedma 2001). According to Patton (2007, p. 34), “generally, the productivity of a firm lies more in its IC and systems capabilities than in its hard assets”. In fact, Bontis (2001) argues that leveraging knowledge is often the key to a firm’s prosperity.

In turn, the firm is the principal actor that shapes the economic success of the nation (Porter 1991). The role of the nation, then, is to provide a ‘home base’ for the firm, which contributes in shaping its identity. Hence, domestic characteristics or ‘demand conditions’ become critical in creating competitive advantage (Porter 1991; Grant 1991). According to Porter (1991), the national environment exerts a remarkable influence in shaping the firm’s competitive advantage.

Australia’s current disadvantage in a growing knowledge-based economy (KBE) has already been acknowledged (Lim & Dallimore 2004; Wood 2003). According to Sinclair (2001) “the Federal Government has warned that Australia is losing the brain race and is slipping behind in the global market for exporting knowledge-intensive services and electronically mediated work” (cited in Lim & Dallimore, p. 183). A major cultural shift is required for Australia to move from an “old economy” mind-set, where raw materials are the primary source of export income, to a KBE (Wood 2003). Based on Porter’s (1990) view that lack of resources predispose nations towards becoming competitive - that is, abundance generates waste and scarcity generates an innovative mindset - it is reasonable to assert that the main obstacle in the way of Australia achieving this cultural shift is, in fact, its wealth and current financial success mostly derived from the resources sector. Taking a positivist stance, this paper examines the current literature that links IC to company performance and provides suggestions for further research in Australia.

Review of Current Literature

There is no universally accepted definition of IC. This poses a number of challenges for researchers, policy makers, practitioners and consultants (Leon 2002). Perhaps the major challenge is achieving effective communication of IC-related matters across disciplines. IC has been investigated from various perspectives including economic (Augier & Teece 2005), strategic (Marr & Roos 2005), accounting (Lev et al. 2005), financial (Sudarsanam et al. 2005), reporting (Mourtisen 2005), marketing (Fernström 2005), human resources (Johanson 2005), information systems (Peppard 2005), legal (Cloutier & Gold 2005) and intellectual property (Sullivan 2005).

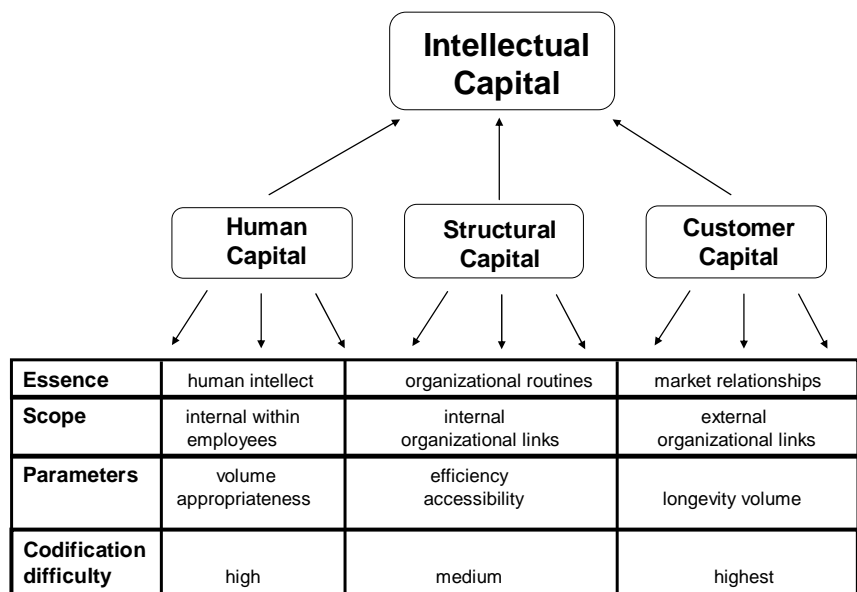
As noted by Guthrie (2001), the term IC is commonly used as a synonym for Intellectual Assets (IA), Intangible Assets (INA) or Knowledge Assets (KA). Edvinsson and Sullivan (1996: 358) define IC as 'knowledge that can be converted into value'. This is a very broad definition, which includes ideas, inventions, general knowledge, designs, software programs and publications. Consistent with the economic literature, some authors (Hunter et al. 2005; Webster 1999) categorize IC as a subset of Intangible Capital (INC). From this perspective, the term 'intangible' refers to assets that do not exist physically, and 'capital' relates to assets retained by the organization to contribute to future profits. James (1997: 92) defines IC as 'the difference between a company's market value and its book value'.

Roos et al. (1997b: 4) define IC as 'all the processes and the assets which are not normally shown on the balance sheet, as well as all the identifiable intangible assets which may be observed on balance sheets (for example, trademarks, patents and brands)'. Human Capital (HC) refers to the firm's individual employees and their corresponding skills, abilities, knowledge and know-how. Each employee has tacit (uncodified) knowledge, which the firm wishes to utilize. The authors refer to HC as the 'soul of the company' and divide it into three components: competence, attitude and intellectual agility. The authors also highlight the importance of minimizing employee turnover through training and development, and human resource management policies.

In explaining the role of IC, Edvinsson and Malone (1997) liken organizations to a tree, observing that both are living organisms with corresponding elements. Available documents (charts, annual reports, quarterly statements, company brochures and other documents) are represented in the visible components of the tree (the trunk, branches, leaves and fruits). However, assuming that this represents the true nature of the tree, or even its future health, is misleading. In fact, the root system (which remains invisible, buried underground) significantly determines the future health of the tree. The damage caused by a parasite living in the root system can easily kill the tree that today appears perfectly healthy in its surface appearance. Thus, the astute investor would need to pay attention to the roots of the company (arguably, its IC) in order to assess the future value of the company.

Stewart (1991) refers to the 'information age' economy and the 'knowledge economy' as a revolution. Within this radical change, information replaces working capital, and intellectual assets replace physical ones. We are now in an era in which natural resources and physical labour have largely been replaced by knowledge and communication as the fundamental sources of wealth. According to Sveiby (1998a), we have entered a 'New Economy' with 'invisible' values.

Sveiby (1998b) identifies 21 different intangible assets measuring models, which he places into four categories (market capitalization, return on assets, direct intellectual capital and scorecard method). Despite the diversity of IC models, there is a great deal of convergence in most approaches investigating IC from an intellectual capital-based view (ICV) of the firm (e.g. Bollen et al. 2005; Bontis 1998, Bontis et al. 2000; Jacobsen 2005; Leliaert et al. 2003; Luu et al. 2001; Marr & Roos 2005, Pike & Roos 2000, 2005; Roos et al. 1997; Sáenz 2005; Swart 2006). As noted by Youndt et al. (2004), while there are slight variations across these frameworks, this convergence in classification comprises three main constructs, as depicted by Bontis (1998) in Figure 1:



Bontis (1998: 66)

Figure 1 – Bontis (1998) model of IC

- **Human Capital (HC)** - the intangibles that rest within the minds of individuals, such as knowledge, competencies, experience, know-how etc.
- **Structural Capital (SC)** - that which remains in the organization after employees go home at the end of the working day, such as the organization’s processes, information systems, databases etc.
- **Customer (or Relational) Capital (CC)** - the relationships the organization has established with resource providers, customers and other key stakeholders.

This classification is also consistent with the European Commission findings documented in MERITIUM (2002) and RICARDIS (2006), which involved researchers from the Copenhagen Business School (Denmark), the Research Institute of the Finnish Economy and the Swedish School of Economics and

Business Administration (Finland), Group HEC (France), Norwegian School of Management (Norway), IADE – Autonomous University of Madrid and the University of Seville (Spain – Coordinator), and Stockholm University (Sweden).

At this point, it is pertinent to briefly clarify some of the IC-related terminology used by different authors in relation to the terms outlined above. In some instances, authors use slightly different terms to describe the same, or very similar, constructs. In other instances, however, while the terms appear to be related, they have substantially different meanings. Reed and Whitman (2006: 4), for example, point out that ‘while the terms to label the various IC components may differ, conceptually IC consists of the three basic components: human, organizational, and social capital, the last containing both external and internal dimensions’. They further assert that taking an ICV of the firm facilitates testing hypotheses empirically, as opposed to taking a resource-based view (RBV) of the firm. The RBV gained importance during the 1980s (Bollen et al. 2005) and pertains to the strategic management literature that investigates the firm’s resources and sustained competitive advantage (Amit & Shoemaker 1993; Barney 1991, 1999; Black & Boal 1994; Grant, 1991; Peteraf 1993; Teece et al. 1997; Wernerfelt 1984). This view advocates the importance of resource integration and claims that the combination of the IC components leverages the values of the other components (Reed & Whitman 2006).

“The Balanced Scorecard (BSC) (Kaplan and Norton, 1992) extends traditional tangible/measurable in traditional financial terms perspective of the organization with the three additional layers: clients (comparable to relational or customer capital), internal and business processes (comparable to structural capital) and learning and growth (comparable to human capital)” (Anskaitis, et al. 2006: 66). Kaplan and Norton (2004) use the terms Human Capital (HC), Information Capital (INFC) and Organization Capital (OC). While their concept of INFC is mostly consistent with the SC concept used by Bontis (1998), their concept of OC departs from the CC construct used by Bontis (1998) in incorporating the organization’s culture and leadership, and employees’ ability to share knowledge.

Youndt and Snell (2004: 338) highlight how the term Organizational Capital – ‘institutionalized knowledge and codified experience stored in data bases, routines, patents manuals, structures and the like’ is also referred to in the literature as Structural Capital. The authors argue that the term Organizational Capital is more accurate, as this type of knowledge is owned by the firm.

Sveiby (1997b) uses the terms Individual Competence, Internal Structures and External Structures when referring to virtually the same concepts defined as Human Capital, Structural Capital and

Relational/Customer Capital respectively by other authors (Bontis 1998, Edvinsson & Sullivan 1996; Youndt & Snell 2004). Jacobsen et al's. (2005) model, the IC Rating™, uses the terms Organizational Structural Capital (that is, intellectual properties and processes), Relational Structural Capital (network, brand and customers) and Human Capital (management and employees).

Other authors (Bueno et al. 2004; Koka & Prescott 2002; Nahapiet & Ghoshal 1998; Viedma 2004) use the term Social Capital, which they identify as having a multidimensional nature and direct impact on resource mobilization and organizational learning. Koka and Prescott (2002) define Social Capital in terms of the information benefits available to a firm as a result of its strategic alliances. Adler and Kwon (2002) refer to the term Internal Social Capital (ISC) in their conceptualization of Social Capital as having both internal and external links. As pointed out by Youndt and Snell (2004: 338), Bontis' (1998) concept of Relational Capital is 'virtually identical to what sociologists and organizational theorists refer to as Social Capital'. The concept of Social Capital has also been addressed in the sociological literature (Coleman 1998).

The challenge for researchers is to avoid the potential confusion that may result from this barrage of nomenclature in the literature. Scholars might be well advised to take up Bontis' (2001) suggestion to develop and test various measures, rather than simply re-label measurements of similar constructs.

The Australian Landscape

Consistent with most first-world countries, although at a faster pace, Australia has experienced a major shift in its source of gross domestic product (GDP): 73 per cent of the workforce is employed in the knowledge and services sector and contributes 52 per cent to national GDP (Society for Knowledge Economics 2007). This unprecedented historical shift implies a move away from traditional commodities, resources and manufacturing sectors towards a service and intangible-based value creation economy (education and tourism, for example). By changing its corporate landscape, Australia has become a leader in financial services, insurance products, software development, biotechnology and training and development (Guthrie & Petty 2000).

The objectives and methodologies used in IC-related research in Australia vary greatly. As a result, the research findings are also varied. According to Morris et al. (1998), the Australian share market and

analysts focus on value realization in financial terms (value extraction), as opposed to longer-term value creation.

An Australian project team (Boedker et al. 2005) designed and used the Intellectual Capital Value Creation (ICVC) framework to investigate Intellectual Capital Management, Measurement and Reporting (ICMMR). This was a pilot study of the Australian Government Consultative Committee on Knowledge Capital (AGCCKC) and aimed at identifying a large public sector organization's invisible sources of value creation and making these explicit to external stakeholders. The ICVC framework is rooted in Sveiby's (1997b) original IC tripartite model (Intangible Assets Monitor – IAM), which was used by Petty and Guthrie (2000). Clearly, the ICVC framework is a value creation model, and is comparable to the strategic focus provided by Kaplan and Norton's (1996, 2006) Balanced Scorecard (BSC) and Skandia's IC Navigator (Edvisson & Malone 1997). The ICVC, however, does not purport to provide a causal relation between financial indicators as do the BSC or other models provided by some Australian management consulting firms (Deloitte 2005; PricewaterhouseCoopers' Value Reporting TM [cited in Morris et al. 1998]).

The ICVC framework appears to be a holistic and practical methodology and worth considering in researching IC from a strategic and value-creation perspective. The case study in which the ICVC framework was used reported a number of benefits to the project and to executive teams of the client organization. These benefits included identifying some weaknesses in how the organization utilized knowledge resources.

Also from a strategic perspective, Zhou and Fink (2003) developed the Intellectual Capital Web (ICW) framework and conducted a survey designed to explore current Australian practices relating to KM and IC. The study targeted the top 300 companies listed on the Australian Stock Exchange, and 40 public sector organizations. The sample yielded only a 20 per cent response rate. Hence, the findings should be interpreted with caution. The authors recommend further investigation of the dynamic development of the core capabilities that enable organizations to identify and take up opportunities.

Abeysekera (2001) provides a framework to audit IC and Abeysekera (2006) reviews issues relating to IC disclosure. Using case studies analysis, Bose and Oh (2004) identify the value-drivers in three intellectual capital-intensive sectors in Australia. Further, the authors discuss key issues pertaining to the strategic management of value and risk in IC. Using a single in-depth case study, Cuganesan (2005) investigates the inter-relationship between different components of IC and value creation within an Australian

financial services firm. The study reports the interrelationship between different IC elements and value creation to be pluralistic and temporally contingent. Guthrie et al. (2004) provide a review of content analysis as a research method in understanding IC reporting and offer observations on the practical utility of the method.

Petty and Guthrie (2002) urge researchers to keep their work focused and relevant to business practices. Regarding methodology, they assert that the most valuable insights are likely to result from using a combination of research methods.

In summary, previous IC-related research conducted in Australia has presented new frameworks based on a relatively popular and well-established model of IC (Sveiby 1997b). These studies, however, have been largely qualitative and exploratory in nature, concerned with investigating current levels of awareness, perceptions and reporting practices of IC. Most Australian studies on IC have been primarily descriptive and have used qualitative measures, but have not tested the relationship between IC and firm performance with Australian data.

Suggestions for Future Research in Australia

While the investigations outlined thus far provide valuable insights, there is now a need to empirically investigate whether IC makes a real difference to actual corporate performance. This may be researched by examining the causal relationship between IC and company performance. There are a number of possible methodologies and approaches that can be used to measure the independent variable IC. Sveiby (1998b) identified 21 models; thus, researchers can test the use of different IC measurement models to measure the IC of Australian companies.

We recommend that researchers consider the use of two commonly used models of Bontis (1998) and Pulic (1998) to measure IC as they represent contrasting methods. Bontis' (1998) model of IC is a sound foundation from which to investigate the relationship between IC and company performance. The rationale for this choice is that Bontis' (1998) model has been identified as the most widely and cross-culturally used model to empirically investigate this relationship. In his exploratory study, Bontis (1998) first developed an instrument to empirically link the three independent variables, Human Capital (HC), Structural Capital (SC) and Customer Capital (CC) to the dependent variable, Company Performance (P). The same instrument was used by Bontis et al. (2000) in a study investigating IC and business

performance in Malaysian industries. Bontis & Fitz-enz (2002) further refined the instrument using data collected from the financial services industry. Youndt & Snell (2004) used a modified version of Bontis' (1998) instrument in their study investigating human resource configurations, IC and organizational performance. More recently, and using Bontis' (1998) overall model, Bollen et al. (2005) empirically tested the relationship between these same variables (HC, SC, CC and P) within the German pharmaceutical industry.

Pulic (1998 and 2000) develops the 'Value Added Intellectual Coefficient' (VAIC™) to measure the IC of companies. The advantage of this model is that the inputs can be obtained from the organizations' financial statements. The Pulic model has also been used by a number of researchers including Firer & Williams (2003) and more recently by Tan et al. (2007).

Bontis (2001) identified the need for more IC research in international settings, and for further exploration of the relationship between IC and company performance. By using a sample of Australian companies, researchers would be contributing to the literature in the areas identified by Bontis (2001).

Bollen et al. (2005), suggest that their findings be tested by exploring the relationship between IC and performance in other industries and countries using a larger sample. This represents another opportunity for researchers in Australia where it is possible to test the relationship between IC and company performance across a range of industries.

In their paper *Managing intellectual capital: from theory to practice*, Petty and Guthrie (2000) argue that there is an emerging need of a 'second stage' in the development of IC research in Australia. This proposed 'second stage' would comprise empirical studies to provide further evidence of any relationship between IC and company performance.

Researchers should consider investigating knowledge intensive firms (KIF) such as financial, insurance, pharmaceutical and other high technology and knowledge-intensive industries like software development and biotechnology for the several reasons. Firstly, these Australian industries have been identified as world leaders (Guthrie & Petty 2000) and are knowledge-intensive industries that have already been investigated in similar studies outside Australia (Bollen, et al. 2005; Bontis & Fitz-enz 2002).

Secondly, some of these sectors have already been identified by other researchers in inter-related disciplines. Examples include the innovation-related research conducted within the financial services

sector (West 2006), knowledge management strategies research conducted within the Australian biotechnology industry (Clarke & Turner 2004) and the IC research conducted within the service industry (Lim & Dallimore 2004). Hence, using these samples should allow the drawing of comparisons with other results of research streams and assist to throw more light on the issues critical to Australia's challenge of prospering, if not leading, the emerging knowledge-based economy.

Conclusion

The growth and rapid evolution of IC over the last two decades can be attributed to the emerging desire to improve individuals' understanding and management of the hidden or invisible assets that add real value to a business. The empirical relationship between IC and firm performance has been investigated in various countries using a number of different models. To the authors' knowledge, no Australian study has tested these relationships. Thus, there is currently an opportunity to conduct some exciting research using Australian data to add to the body of literature on the relationship between IC and firm performance.

References

- Abeyssekera, I. 2001, 'A framework to audit intellectual capital', *Journal of Knowledge Management Practice*, pp: 1-10.
- Abeyssekera, I. 2003, 'Intellectual accounting scorecard-measuring and reporting intellectual capital', *The Journal of American Academy of Business*, vol. 3, no. 1, pp. 422-427.
- Abeyssekera, I. 2006, 'The project of intellectual capital disclosure: researching the research', *Journal of Intellectual Capital*, vol. 7, no. 1, pp. 61-77.
- Adler, P. S. & Kwon, S. K. 2002, 'Social capital: prospects for a new concept', *Academy of Management Review*, vol. 27, no. 1, pp. 17-40.
- Amit, R. & Shoemaker, P. 1993, 'Strategic assets and organizational rent', *Strategic Management Journal* vol. 14, pp. 33-46.
- Anskaitis, A., Bareišis, V. & Lydeka, Z. 2006, 'Constructivist and analytical approach to intellectual capital', *Engineering Economics*, vol. 4, no. 49, pp. 63-68.
- Augier, M. & Teece, D. 2005, 'An economic perspective on intellectual capital', in *Perspectives in Intellectual Capital*, ed. B. Marr, Elsevier Butterworth-Heinemann, Oxford, pp. 3-27.
- Barney, J. 1991, 'Firm resources and sustained competitive advantage', *Journal of Management*, vol. 17, no. 1, pp. 99-120.
- Barney, J. 1999, 'How a firm's capabilities affect boundary decisions ', *Sloan Management Review*, pp. 137-145.
- Black, J. & Boal, K. 1994, 'Strategic resources: traits, configurations and paths to sustainable competitive advantage', *Strategic Management Journal* vol. 15, pp. 131-148.
- Boedker, C., Guthrie, J. & Cuganesan, S. 2005, 'An integrated framework for visualising intellectual capital', *Journal of Intellectual Capital* vol. 6, no. 4, pp. 510-527.
- Bollen, L., Vergauwen, P. & Schnieders, S. 2005, 'Linking intellectual capital and intellectual property to company performance ', *Management Decisions*, vol. 43, n. 9, pp. 1161-1185.
- Bontis, N. 1998, 'Intellectual capital: an exploratory study that develops measures and models', *Management Decision*, vol. 36, n. 2, pp. 63-76.
- Bontis, N. 2001, 'Assessing knowledge assets: a review of the models used to measure intellectual capital', *International Journal of Management Reviews*, vol. 3, n. 1, pp. 4-60.
- Bontis, N. & Fitz-Enz, J. 2002, 'Intellectual capital ROI: a causal map of human capital antecedents and consequents', *Journal of Intellectual Capital*, vol. 3, n. 3, pp. 223-247.
- Bontis, N., Keow, W. C. & Richardson, S. 2000, 'Intellectual capital and business performance in Malaysian industries ', *Journal of Intellectual Capital*, vol. 1, n. 1, pp. 85-97.

- Bontis, N. & Nikitopoulos, D. 2001, 'Thought leadership on intellectual capital', *Journal of Intellectual Capital*, vol. 2, n. 3, pp. 183-191.
- Bose, S. & Oh, K. B. 2004, 'Measuring strategic value-drivers for managing intellectual capital', *The Learning Organization*, vol. 11, no. 4/5, pp. 347-356.
- Brennan, N. & Connell, B. 2000, 'Intellectual capital: current issues and policy implications', *Journal of Intellectual Capital*, vol. 1, no. 3, pp. 206-140.
- Bueno, E. & Salmador, M. P. 2004, 'The role of social capital in today's economy', *Journal of Intellectual Capital*, vol. 5, no. 4, pp. 556-574.
- Carlucci, D., Marr, B. & Schiuma, G. 2004, 'The knowledge-value chain: how intellectual capital impacts business performance ', *International Journal of Technology Management* vol. 27, no. 6/7, pp. 575-590.
- Chen, J., Zhu, Z. & Yuan, H. 2004, 'Measuring intellectual capital: a new model and empirical study', *Journal of Intellectual Capital*, vol. 5, no. 5, pp. 195-212.
- Chen, P. 2005, 'Intellectual capital performance of commercial banks in Malaysia', *Journal of Intellectual Capital*, vol. 6, no. 3, pp. 385-396.
- Chen, M., Cheng, S. & Hwang, Y. 2005, 'An empirical investigation of the relationship between intellectual capital and firm's market value and financial performance', *Journal of Intellectual Capital*, vol. 6, n. 2, pp. 159-176.
- Choo, C. W. & Bontis, N. (Ed). 2002, *The Strategic Management of Intellectual Capital and Organisational Knowledge*, Oxford University Press, New York.
- Clarke, J. & Turner, P. 2004, 'Global competition and the Australian biotechnology industry: developing a model of SMEs knowledge management strategies.' *Knowledge and Process Management*, vol. 11, no. 1, pp. 38-46.
- Cloutier, L. M. & Gold, E. R. 2005, 'A legal perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 125-136.
- Coleman, J. 1998, 'Social capital in the creation of human capital', *American Journal of Sociology*, vol. 94, pp. 95-120.
- Bulletin*, vol. 52, no. 4, pp. 281-302.
- Cuganesan, S. 2005, 'Intellectual capital-in-action and value creation: a case study of knowledge transformations in an innovation project', *Journal of Intellectual Capital*, vol. 6, no. 3, pp. 357-373.

- Deloitte, (29 September 2006), *Human capital: maximising the value of human capital* [Online], Available:
http://www.deloitte.com/dtt/cda/doc/content/us_consulting_humancapitaliq_290606.pdf
- Drucker, P. F. 1993, *Post-Capitalist Society*, HarperCollins, New York.
- Edvinsson, L. & Malone, M. S. 1997, *Intellectual capital: realizing your company's true value by finding its hidden roots*, HarperBusiness, New York.
- Edvinsson, L. & Sullivan, P. 1996, 'Developing a model for managing intellectual capital', *European Management Journal* vol. 14, n. 4, pp. 356-364.
- Fernström, L. 2005, 'A marketing perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 82-95.
- Firer, S. & Williams, S. M. 2003, 'Intellectual capital and traditional measures of corporate performance', *Journal of Intellectual Capital*, vol. 4, no. 3, pp. 348-360.
- Fitz-enz, J. 2000, *The ROI of Human Capital*, Amacom, New York.
- Grant, M. F. 1991, 'The resource-based view theory of competitive advantage: implications for strategy formulation', *California Management Review*, no. 33, pp. 114-135.
- Grant, R. M. 1991, 'Porter's 'Competitive Advantage of Nations': an assessment.' *Strategic Management Journal*, vol. 12, no. 7, pp. 535-548.
- Guthrie, J. 2001, 'The management, measurement and the reporting of intellectual capital', *Journal of Intellectual Capital*, vol. 2, n. 1, pp. 27-41.
- Guthrie, J. & Petty, R. 2000, 'Intellectual capital: Australian annual reporting practices', *Journal of Intellectual Capital*, vol. 1, n. 3, pp. 241-251.
- Guthrie, J., Petty, R., Youngvanich, K. & Ricceri, F. 2004, 'Using content analysis as a research method to inquire into intellectual capital reporting', *Journal of Intellectual Capital*, vol. 5, n. 2, pp. 282-293.
- Guthrie, J. E. 2000, 'Measuring up to change', *Financial Management*, vol. 11, n., pp.
- Hanson, D., Dowling, P., Hitt, M. A., Ireland, D. R. & Hoskisson, R. E. 2002, *Strategic Management" Competitiveness and Globalization*, Butterworth, Boston, MA.
- Hitt, M. A., Bierman, L., Shimizu, K. & Kochhar, R. 2001, 'Direct and moderating effects of human capital on strategy and performance in professional service firms: a resource-based perspective', *Academy of Management Journal* vol. 44, no. 1, pp. 13-28.
- Hunter, L., Webster, E. & Wyatt, A. 2005, 'Measuring intangible capital: a review of current

- practice', *Australian Accounting Review*, vol. 15, no. 2, pp. 4-21.
- James, D. 1997, 'The troubled language of accounting gets tongue-tied over intangibles', *Business Review Weekly*, vol. October, pp. 92-94.
- Jacobsen, K., Hofman-Bang, P. & Jr., N. R. 2005, 'The IC Rating™ model by intellectual capital Sweden', *Journal of Intellectual Capital*, vol. 6, no. 4, pp. 570-587.
- Johanson, U. 2005, 'A human resource perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 96-105.
- Kaplan, R. S. & Norton, D. P. 1992, 'The balanced scorecard - measures that drive performance', *Harvard Business Review*, vol. 70, pp. 72-79.
- Kaplan, R. S. & Norton, D. P. 1996, *Translating Strategy Into Action: The Balanced Scorecard*, Harvard Business School Press, Boston, MA.
- Kaplan, R. S. & Norton, D. P. 2004, 'Measuring the strategic readiness of intangible assets', *Harvard Business Review*, vol. February, pp. 52-63.
- Kaplan, R. S. & Norton, D. P. 2006, 'Response to S. Voelpel et al., "The tyranny of the Balanced Scorecard in the innovation economy', *Journal of Intellectual Capital*, vol. 7, no. 1, pp. 43-60.
- Koka, B. R. & Prescott, J. E. 2002, 'Strategic alliances as social capital: A multidimensional view', *Strategic Management Journal*, vol. 23, pp. 795-816
- Leliaert, P. C. J., Candries, W. & Tilmans, R. 2003, 'Identifying and managing IC: A new classification', *Journal of Intellectual Capital*, vol. 4, no. 2, p. 20
- Leon, M. V. 2002, 'Intellectual capital: managerial perceptions of organizational knowledge resources', *Journal of Intellectual Capital*, vol. 3, no. 2, pp. 149-166.
- Lev, B. 2001, *Intangibles: management, measurement and reporting* Brooking Institution Press, Washington, D.C.
- Lev, B., Canibano, L. & Marr, B. 2005, 'An accounting perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 42-55.
- Luu, N., Wykes, J., Williams, P. & Weir, T. 2001, *Invisible value: the case for measuring and reporting intellectual capital* in ISR New Economy Issues Paper, S. a. R. Department of Industry, Commonwealth of Australia, Canberra.
- Lim, L. K. & Dallimore, P. 2004, 'Intellectual capital: management attitudes in services industries', *Journal of Intellectual Capital*, vol. 5, no. 1, pp. 181-194.
- Marr, B. 2004, 'Measuring and benchmarking intellectual capital', *Journal of Intellectual Capital*, vol. 11, n. 6, pp: 559-570.

- Marr, B. & Roos, G. 2005, 'A strategy perspective on intellectual capital ', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 28-41.
- Marr, B., Schiuma, G. & Neely, A. 2002, 'Assessing strategic knowledge assets in e-business', *International Journal of Business Performance Management*, vol. 4, n. 2, pp: 279-295.
- Martín-de-Castro, G., Navas-López, J. E., López-Sáez, P. & Alama-Salazar, E. 2006, 'Organizational capital as competitive advantage of the firm', *Journal of Intellectual Capital*, vol. 7, no. 3, pp. 324-337.
- MERITUM, Cañibano, L., Sánchez, P., García-Ayuso, M. & Chaminade, C., (8 June 2007), Guidelines for managing and reporting on intangibles (Intellectual Capital Report) [Online], Available: <http://www.uam.es/proyectosinv/meritum/>.
- Morris, G., Eccles, R. G. & Falconer, I. D. 1998, *Value reporting in Australia*, available at: [http://store.barometersurveys.com/docs/ValueReporting_White_Paper\(Text\).pdf](http://store.barometersurveys.com/docs/ValueReporting_White_Paper(Text).pdf).
- Mourtisen, J., Bukh, P. N. & Marr, B. 2005, 'A reporting perspective on intellectual capital', in *Perspectives on Intellectual Capital*, Elsevier Butterworth Heinemann, Burlington, MA, pp. 69-81.
- Nahapiet, J. & Ghoshal, S. 1998, 'Social capital, intellectual capital, and the organizational advantage', *Academy of Management Review*, vol. 23, no. 2, pp. 242-266.
- Nelson, R. & Winter, S. 1982, *An Evolutionary Theory of Economic Change*, Belknap Press, Cambridge, MA.
- Nonaka, I. & Takeuchi, H. 1995, *The Knowledge-Creating Company*, Oxford University Press, New York.
- Patton, J. R. 2007, 'Metrics for knowledge-based project organizations', *Academy Management Journal*, vol. 72, no. 1, pp. 33-43.
- Peppard, J. 2005, 'An information systems perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 106-124.
- Peteraf, M. A. 1993, 'The cornerstones of competitive advantage: a resource-based view', *Strategic Management Journal*, vol. 14, pp. 179-191.
- Petty, R. & Guthrie, J. 1999, 'Managing intellectual capital: from theory to practice', *Australian CPA*, vol. 69, n. 7, pp: 18-20.
- Petty, R. & Guthrie, J. 2000, 'Intellectual capital literature review: measurement, reporting and management', *Journal of Intellectual Capital*, vol. 1, n. 2, pp. 155-176.
- Pike, S. & Roos, G. 2000, 'Intellectual Capital Measurement and Holistic Value Approach

- (HVA)', *Woks Institute Journal*, vol. 24, pp. 2-15.
- Pike, S. & Roos, G. 2005, 'Intellectual capital: Management approach in ICS Ltd', *Journal of Intellectual Capital*, vol. 6, no. 4, pp. 489-510.
- Porter, M. 1985, *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York.
- Porter, M. E. 1990, *The Competitive Advantage of Nations*, Free Press, New York.
- Pulic, A., (1998), "Measuring The Performance of Intellectual Potential In Knowledge Economy". Available online: <http://www.measuring-ip.at/OPapers/Pulic/Vaictxt/vaictxt.html>.
- Pulic, A., (2000), "VAIC™ - An Accounting Tool for IC Management". Available online: <http://www.measuring-ip.at/Papers/ham99txt.htm>.
- Quinn, J. B. 1992, *Intelligent Enterprise*, Free Press, New York.
- Reed, K. K. & Whitman, M.J. 2006, 'Proposing and testing an intellectual capital-based view of the firm', *Journal of Management Studies*, vol. 43, pp. 867-893.
- Riahi-Belkaoui, A. 2003, 'Intellectual capital and firm performance of US multinational firms', *Journal of Intellectual Capital* vol. 4, no. 2, pp. 215-225
- RICARDIS, 2006, Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs [Online], European Commission, Available: <http://www.madrimasd.org/proyectoseuropeos/documentos/doc/ricardis.pdf>.
- Roos, G. & Roos, J. 1997, 'Measuring your company's intellectual performance', *Long Range Planning*, vol. 30, n. 3, pp. 413-426.
- Roos, J., Roos, G., Dragonetti, N. C. & Edvinsson, L. 1997, *Intellectual Capital: navigating the new business landscape*, MacMillan Press Ltd, London.
- Sáenz, J. 2005, 'Human capital indicators, business performance and market-to-book ratio', *Journal of Intellectual Capital*, vol. 6, n. 3, pp. 374-384.
- Society for Knowledge Economics. 2007, *Intangible drivers of organisational productivity and prosperity*, D. o. F. a. Administration, Society for Knowledge Economics.
- Starbuck, W. H. 1992, 'Learning by knowledge-intensive firms.' *Journal of Management Studies*, vol. 3, no. 4, pp. 262-275.
- Stewart, T. A. 1991, 'Brainpower', *Fortune Magazine*, vol. June.
- Stewart, T. A. 1997, *Intellectual Capital: The New Wealth of Organizations*, Doubleday, New York.
- Stewart, T. A. 2002, *The Wealth of Knowledge: Intellectual Capital and the Twenty-first Century Organization*, Doubleday, New York.
- Sudarsanam, S., Sorwar, G. & Marr, B. 2005b, 'A finance perspective of intellectual capital', in

- Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 56-68.
- Sullivan, P. H. 2005, 'An intellectual property perspective on intellectual capital', in *Perspectives on Intellectual Capital*, ed. B. Marr, Elsevier Butterworth Heinemann, Burlington, MA, pp. 137-151.
- Sveiby, K.E. (1997a), *The intangible assets monitor* [Online], Available: <http://www.sveiby.com/Portals/0/articles/IntangAss/CompanyMonitor.html>.
- Sveiby, K. E. 1997b, *The New Organizational Wealth: Managing and Measuring Knowledge-based Assets*, Berrett Koehler, San Francisco.
- Sveiby, K. E., (1998a), *Intellectual Capital and Knowledge Management* [Online], Available: <http://www.sveiby.com/Portals/0/articles/IntellectualCapital.html> [2 September 2006].
- Sveiby, K. E., (1998b), *Measuring intangibles and intellectual capital - An emerging first standard* [Online], Available: <http://www.sveiby.com/Portals/0/articles/EmergingStandard.html> [16 September 2006].
- Sveiby, K. E. 2001, 'A knowledge-based theory of the firm to guide in strategy formulation ', *Journal of Intellectual Capital*, vol. 2, n. 4, pp
- Swart, J. 2006, Intellectual capital: disentangling an enigmatic concept. *Journal of Intellectual Capital*, 7, pp. 134-160.
- Swart, J. & Kinnie, N. 2003, 'Sharing knowledge on knowledge-intensive firms', *Human Resource Management Journal*, vol. 13, no. 2, pp. 60-75.
- Tan, H. P., Plowman, D. & Hancock, P. 2007, 'Intellectual capital and financial returns of companies', *Journal of Intellectual Capital*, vol. 8, no. 1, pp. 76-95.
- Teece, D. Pisano, G. & Shuen, A. 1997, 'Dynamic capabilities and strategic management', *Strategic Management Journal*, vol. 18, no. 7, pp. 509-533.
- Toffler, A. 1990, *Powershift: Knowledge Wealth and Violence at the Edge of the 21st Century*, Bantan Books, New York.
- Viedma, J. M. 2001, 'Intellectual capital benchmarking system', *Journal of Intellectual Capital*, vol. 2, no. 2, pp. 148-164.
- Viedma, J. M. 2004, 'Social capital benchmarking system: profiting from social capital when building network organizations', *Journal of Intellectual Capital*, vol. 5, no. 3, pp. 426-442.
- Webster, E. 1999, *The Economics of Intangible Investment*, Edward Elgar Publishing, London.
- Wernerfelt, B. 1984, 'A resource-based view of the firm ', *Strategic Management Journal*, vol. 5, no. 2, pp. 171-180.

- West, J. 2006, *A Strategy to Accelerate Innovation in NSW: Outline for Policy Development*, Australian Innovation Research Centre (AIRC).
- Wood, J. 2003, 'Australia: an under performing knowledge nation?' *Journal of Intellectual Capital*, vol. 4, no. 2, pp. 144-164.
- Youndt, M. A. & Snell, S. A. 2004, 'Human resource configurations, intellectual capital, and organizational performance', *Journal of Managerial Issues*, vol. XVI, no. 3, pp. 337-360
- Youndt, M. A., Subramaniam, M. & Snell, S. 2004, 'Intellectual capital profiles: an examination of investments and returns', *Journal of Management Studies*, vol. 41, no. 2, pp. 335-361.
- Zhou, A. Z. & Fink, D. 2003a, 'The intellectual capital web: a systematic linking of intellectual capital and knowledge management', *Journal of Intellectual Capital* vol. 4, n. 1, pp. 34-48.
- Zhou, A. Z. & Fink, D. 2003b, 'Knowledge management and intellectual capital: an empirical examination of current practice in Australia', *Knowledge Management Research & Practice* vol. 1, n., pp. 86-94.

End of paper