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Stefania Veltri

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Empirical evidence of relationships between Intellectual Capital performance and firm value

Stefania Veltri
Department of Business Sciences – Università della Calabria
Ponte Bucci, 87036 Arcavacata di Rende (CS), Italia – Phone: 0984/492126; Fax (office) 0984/492277
Email: stefania.veltri@unical.it

Abstract

Intangibles are the main firm value drivers. This consideration implies that it becomes ever more critical to focus on the relationship between Intellectual Capital (IC) performance and the firm's value, in order to validate with empirical data, instead of just assuming, the existence of such a link. By analyzing most of the existing research on the relationship between IC performance and firm performance, the article highlights the main results reached and makes some reflections on future research trends in the IC field.

Keywords: Intellectual capital, intangibles, performance, value, firm

1 - Introduction

The main aim of the firm is to create value (Rubino, 2004; Donna 1999; Marr et al., 2004). Empirical evidence shows that intangibles are the main firm value drivers (Lev, 2001; Kaplan & Norton 2004) and the new critical factors of firm success (Pozzoli, 1996). The main aim of the paper is to supply a state-of-the-art of the empirical evidence of relationships between Intellectual Capital (IC) and firm performance by systematizing the existing researches on such relationship.

Before addressing the theme, the definition of IC and of the variable chosen as the synthesis indicator of a firm's value should be explained, because these two concepts are the variables subject of analysis in a direct relationship.

The main existing research on the relationship between Intellectual Capital (IC) and firm performance will be shown, in order to highlight the main results achieved by researchers. The surveys focusing on the relationship between IC as a whole and firm performance will be analyzed, as well as research focusing on IC sub-domains and firm performance.

The research path is structured in two steps. The first step concerns the identification of the scientific basis that represents the foundation of the research. Hence, the analysis regards the studies focusing on intangible resources, intellectual capital and the studies focusing on performance. The method used is a critical review on the literature existing on IC and performance, high-

lighting the variables for the intellectual capital concept which stimulated the second generation (*advanced* studies) IC studies of the features of the current IC notion and the articulation of IC which we take into account.

With reference to the firm's performance concept, its significance has been examined in relation to IC. The second step regards the study of research based on empirical evidence, in order to highlight the results which emerge from these studies on the link between IC and performance. The method used is a critical review of most of the existing research. The main aim is to underline the main results reached by researchers and if possible to arrive at general outcomes, in spite of the different methods used.

Whilst the literature places considerable attention on the valuation, measurement and reporting of IC for external reporting purposes, far less attention has so far been given to the implications of IC for the firm's performance.

The paper addresses this topic, by analyzing the majority of existing research on this relationship. The paper shows that there is a lack of systematic research for a link between IC and firm's performance, and that the results of existing ones are ambiguous and focused on partial aspects of IC rather than on the firm's IC as a whole.

Research opportunities are open to seeking a more complete model able to explain the relationship between IC and the firm's performance, as well as to enlarging the empirical evidence, by carrying out further research of this relationship in other countries.

2 – The Intellectual Capital shared notion

The definition and classification of intangibles is still an open question (Zambon, 2004; Marr, Schiuma & Neely, 2004). To outline a review of the most important definition of intangibles is something that goes beyond the scope of the paper; the aim is to underline the "transversality" of the theme of intangibles. Scholars interested in intangibles have dealt with the theme in relation to their research interests (such as firm evaluation, marketing, accounting, etc.), focusing from time to time on different aspects and also using different terminology (e.g. intangible assets in the accounting field, intellectual capital in the managerial field)[1].

[1] For the evolution of the intangibles concept in the accounting field see Lev, 2001, Terzani, 2002, Mulazzani & Gori, 2003 Bandettini, 2005, Giunta & Pisani, 2005, Musaio 2005, Fazzini 2004, Ferraro, 2007; in the field of firm evaluation see Rappaport, 1986; Stewart, 1991; Copeland, Koller & Murrin, 1994, Musaio, 2002, Donna & Revellino, 2004; Guatri & Bini, 2005; Liberatore, 2006; Silvestri 2007; in the managerial field see Mouritsen et al. 2001, Mouritsen et al., 2002). In the article the terms "intangibles" and "Intellectual Capital" are used as synonymous.

The theme of IC study had a boom after the second half of the nineties, in which a lot of definitions of intellectual capital were made, either by academic authors or by businessmen working with IC; other IC definitions also derived from important national and international projects focused on the Intellectual Capital theme (for a brief summary of the main classification of intellectual capital, see Hunter, Webster & Wyatt, 2005; for an update of some major historical developments on IC literature, see Bontis, 2001; Andriessen, 2004; Yongvanich & Guthrie, 2004).

All of the major players in the IC field share the idea that intellectual capital, from a qualitative point of view, can be divided into three categories: *structural capital, human capital and relational capital,* according to the Bontis model (Bontis, 1998)[2].

Even if the labels utilized are different, the content of the categories is more or less quite similar (Bontis, 2001). Briefly, *human capital* consists in knowledge, capabilities, competencies and skills possessed by firm workers; it is a kind of capital which is not the property of the firm, so the company needs to enforce the link with its workers as well as needing to find ways to transform tacit knowledge into structured knowledge. *Structural (or organizational) capital* is constituted of structured knowledge possessed by the firm and shareable within the firm (e.g. database, procedures etc.). The *relational capital* is the totality of relations between firms and their main stakeholders.

The IC notion is a *dynamic* one (Anskaitis & Bareisis, 2005). From this it emerges that IC is a concept in evolution, so researchers must introduce new sequences in the IC categories. The IC definitions had an evolution passing from the first, *pioneering* studies to the *advanced* ones (Chiucchi, 2004; Veltri, 2007a). Pioneering studies focus on IC categories and their content instead of the links between them; their main aim is to explain, by analysing IC, the gap between firm market value and book-keeping firm value. The advanced studies focus on interactions between the IC sub-domains as the main value creators, stress the key role of knowledge which lies at the basis of IC creation and development, the key role of knowledge activities together with knowledge resources, the role of IC report as a management tool related to knowledge activities management and the importance of knowledge strategy as starting point to identify IC performance indicators (Chiucchi, 2005) (fig. 1).

The studies of Edvinsson & Malone (1997), Sveiby (1997a, 1997b), Roos et al.(1997) are classifiable as *pioneering studies*. The studies undertaken during the international IC projects Danish Agency for Trade and Industry project (DATI 2000, DMSTI 2003) and MERITUM project (2002) are considered *advanced studies*. The Danish Guidelines do not give a classification of IC, instead they give a classification of knowledge resources: employees, customers, processes

2 The first definition (Stewart, 1997) structures IC into three categories: human capital, structural capital and customer capital. Only afterwards relational capital substitutes customer capital (Bontis, 1998).

and technologies. The MERITUM report validated the three-way division of intellectual capital into human, structural and relational capital (for a comparison of these models, see Guthrie & Yongvanich, 2004, Chiucchi 2004; for an analysis of main IC frameworks, see Zambon, 2003; Marr & Adams 2004; Veltri & Nardo, 2007; Sveiby, 2001).

Fig. 1 – A comparison of pioneering and advanced studies in Intellectual Capital

	PIONEERING STUDIES		ADVANCED STUDIES
Notion of IC	IC as a sum of intangible resources	→	IC as a system of intangible resources
Focus	Categories of IC	→	Interactions between categories/elements of IC
Main aim	To explain causes of the gap between book-keeping firm value and market firm value	→	To identify the paths of value creation which lever on knowledge
Elementary unit of measurement	Intangible resource	→	Intangible activity
Vision of IC	Static	→	Dynamic
Conceptual assumption	To measure value	→	To manage knowledge

Source: Veltri (2007b)

In the article use is made of the IC MERITUM classification as the IC referring model to describe the content of the IC category, also because it is the most known, shared and used IC classification model by firms (fig. 2).

Fig. 2 – MERITUM's Intellectual Capital classification

IC categories	
Human	The knowledge that employees take with them when they leave the firm. Includes knowledge, skills, experiences and people abilities. Some of this knowledge is unique to the individual, some may be generic.
Structural	The knowledge that stays within the firm at the end of the working day. Comprises the organisational routines, procedures, systems, cultures, databases, etc. some may be legally protected and become Intellectual Property Rights, legally owned by the firm under separate title.
Relational	All resources linked to the external relationship of the firm, with customers, suppliers or R&D partners. Comprises that part of human and structural capital involved with the company's relations with stakeholders (investors, creditors, customers, suppliers, etc.) plus the perceptions that they hold about the company.

Source: MERITUM (2002, p. 63)

Many writers also focus on splitting IC categories into lower level components.

The figure 3 shows an example of IC lower level components, taken from IC literature (Beattie & Thomson, 2004).

Fig. 3 - Lower level IC classification

Human Capital	Structural Capital	Relational Capital
Absence	Achieving mechanism culture	Basic marketing capability
Adaptability	Administrative processes	Brands
Attitudes	Brands	Business collaborations
Capability / abilities	Communication systems	Client profile
Commitment	Competitive and market channels	Collaboration
Communicative abilities	Copyrights	Commercial power
Competence	Corporate / organisational culture	Competitive intelligence
Computer literacy	Cultural diversity	Competitors
Creativity	Culture	Connectivity
Development	Customer support	Customer knowledge
Education	Customer-centred	Customer loyalty
Employee expertise	Databases	Customer names
Employee flexibility	Distribution channels	Customer reputation
Employee knowledge	Documentation services	Customer satisfaction
Employee productivity	Financial relations	Customers
Employee satisfaction	Infrastructure	Diffusion
Employee value	Innovation	Distribution channels
Employees	Intellectual property	Environmental activities
Entrepreneurial spirit	Intellectual resources	Favourable contracts
Equality	Knowledge centre	Financial contracts
Expert networks	Knowledge-based infrastructure	Franchising agreements
Expert teams	Laboratories	Image
Friendliness	Management philosophy	Intensity
Further personal / professional training	Management processes	Knowledge / acquaintance with community
Human assets	Operation process	Knowledge / acquaintance with government
Human resources	Organisational flexibility	Knowledge / acquaintance with suppliers
Human value	Organisational learning	Licensing agreements
Identification	Organisational routines	Links with suppliers
Innovation	Organisational structure	Market intensity
Innovative capacity	Patents	Negotiating capacity with financial entities
Juristic competence	Procedures	Networking
Know-how (employees)	Process capability	New strategic customers
Learning capacity	Quality improvements	Reputation
Loyalty to organisation	Quality management	Research collaborations
Motivation	Research projects	Stakeholders
Perceptions	Specialised software / IT	Supplier knowledge
Personal / professional experience	Systems (information / network)	
Personal ability	Trademarks	
Personnel		
Recruitment		
Reflect experiences (previous)		
Sensitivity		
Skill (employees)		
Social competence		
Staff (employee) profile		
Staff turnover		
Structural knowledge		
Taking responsibility		
Teamwork capacity		
Tolerance for ambiguity		
Up-to-date competence		
Vocational qualifications		
Work-related competencies		
Work-related knowledge		

Source: Beattie & Thomson (2004)

Of course the table cannot be considered an exhaustive list of IC components; as is recognised in the literature (Edvinsson & Malone, 1997, argued that IC cannot be fully exhaustive, while Sveiby, 1997a p. 150, stated that an IC measurement system that presents a full and comprehensive list of a company's intangible assets does not exist), a classification of intangibles is constantly undergoing change (Grojer, 2001) because of this, it is a dynamic concept and above all, because the IC articulation is really different in relation to the sector, industry, typology, size of the firm etc. In other words, IC is a *firm specific* notion (Kianto, 2007).

3 – The measures of a firm's performance

Performance measurement is a complex phenomenon, which in other words concerns the achievement of a firm objectives. It is a phenomenon which can be examined from different points of view that demand different types of performance measurement, which can be examined on different organizational levels and which can refer to present results, to potential results and to activities. For this reason it is not easy to define performance properly (Neely, Mills, Gregory and Platts, 1995).

With the noun *performance* is intended the results of performances and choices, with the noun *measurement* the assignment of value numbers to objects or events according to rules and predetermined aims, with the expression *performance measurement* the process of measuring the ability of an object to attain results related to defined objectives, with the expression *measurement system* the coordinated system of structure, methodologies and processes which defines and surveys performance with the aim to communicate, to interpret, to orient and to value firm behaviour (Silvi, 1995).

In particular the specific modalities to measure performance regards the quantification of the *efficiency* and *effectiveness* of an action (Neely, Mills, Gregory and Platts, 1995)[3].

From an operative point of view, typical firm performance measures are the income, the value increment of economic capital, the profitability rates (i.e. ROI, ROE), the Economic Value Added (EVA) etc, that constitute synthesis values of firm performance.

The main measure used to highlight the estimated contribution of IC performance to the firm performance assumes that the concept of performance coincides with the concept of *value* and assumes that IC value is represented by the difference between the firm's market value and the firm's book-keeping value. The assumption behind the reasoning is that, since the firm's book-keeping value, because of its construction rules, cannot take into account the firm's intellectual capital, but only a part of the firm intangibles, that is the intangible assets[4], and since the market (i.e. the investors) are able to recognise the overall firm value (comprehensive of the value of its intangible assets), the difference between the two values shows the IC value.

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3 Efficiency measures concern physical return of productive process, which is the relationship between results achieved and means employed (Brunetti, 1989), the effectiveness measures concern the capability of reaching the main aims of the firm in the best way (Bergamin Barbato 1991).

4 The balance sheet has difficulties to measure correctly the intangibles value, for its construction rules (i. e. the use of historical cost and the impossibility of registering internally produced intangibles). Even if the first limit found a corrective, introduced by IASB and FASB, with the possibility of registering intangibles , at their *fair value* and respecting well-defined rules, we are talking about, in any case, intangible assets; in no case is it possible to register intangible assets that do not respect those rules and, moreover, intangible activities (Ferraro, 2007). The concept of intellectual capital is bigger than that one of intangible assets (Zambon, 2004).

The theoretical statement that the typical measure of a firm's performance is the firm's market value, or rather, its increment, is typical of the north American school and is different from the European one (and Italian one particularly), which sees the firm's value creation as the increase of economic capital value[5].

The difference is that, whilst in the markets characterized by efficient financial markets there is contemporaneousness between the creation of the firm's economic capital value and the creation of the firm's market value, in the national contexts characterized by not efficient financial markets (i.e. Italy) this contemporaneousness does not exist, so it is necessary for the management to spread the value created through communication and interventions on the financial markets (Guatri & Bini, 2005). In any case, the two definitions are related by a logical nexus, because the firm's market value, which is the price that the investors are ready to pay, derives from the firm's economic capital value, which in turn derives from the investment attended benefits, that is from the firm forecast profitability[6].

4 – Empirical evidence of a relationship between Intellectual Capital performance and the firm's value

The typical measure of firm performance used in relation to IC is therefore the market firm value, or rather, its increment (Firer and Williams, 2003). Much research on IC (Kaplan & Norton 2004; Lev, 2001) used the empirical evidences of the widening gap between market and book firm value to suggest that there was a hidden value, the IC value, which must be discovered (fig. 4).

It should be underlined, above all, that the IC value calculated in this way is a residual one, which compares two values calculated utilising different measure units and that this difference can modify in relation to changes in the accounting term (for changing in accounting rules, undervaluation of tangible or financial assets in the balance sheet, or simply because value cannot include some intangible assets) and in the market value (which might not accurately capture intrinsic firm value or might be affected by exogenous market factors which could have nothing to do with IC (Pike & Roos, 2005; Garcia & Ayuso, 2003).

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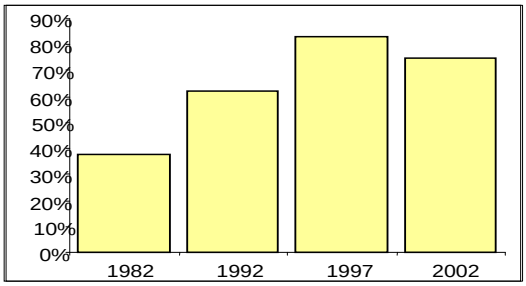
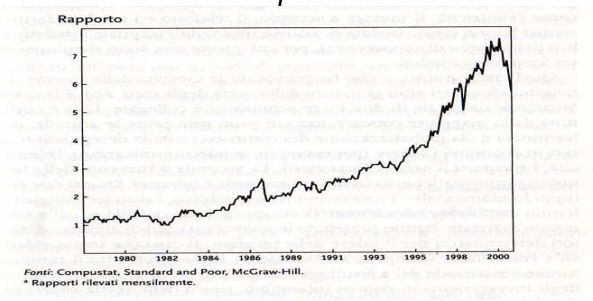
[5] The economic capital is the capital of the firm intended as investment. With economic capital, we intend the discounted estimated firm incomes (Zappa, 1950, p. 81).

[6] Of course, even the firm's performance measures must be different for different purposes, therefore, if the aim of the researcher is to highlight the firm value process creation, the financial value is not the adequate measure, because it does not allow the causes of the firm's value increment to be identified, since it is a number (Mouritsen et al, 2001, Veltri, 2007c). There are many meanings for value, and financial value is only one of these (Andriessen, 2003). Within the advanced systems frameworks, the more correct and meaningful value dimension by which to appreciate the real intangibles' value is the *value in use* ("…This value can be called the use value, and a set of knowledge resources are needed to create it…", DMSTI, 2003, p. 12).

Fig. 4 – The estimated intangibles contribution to the firm value market



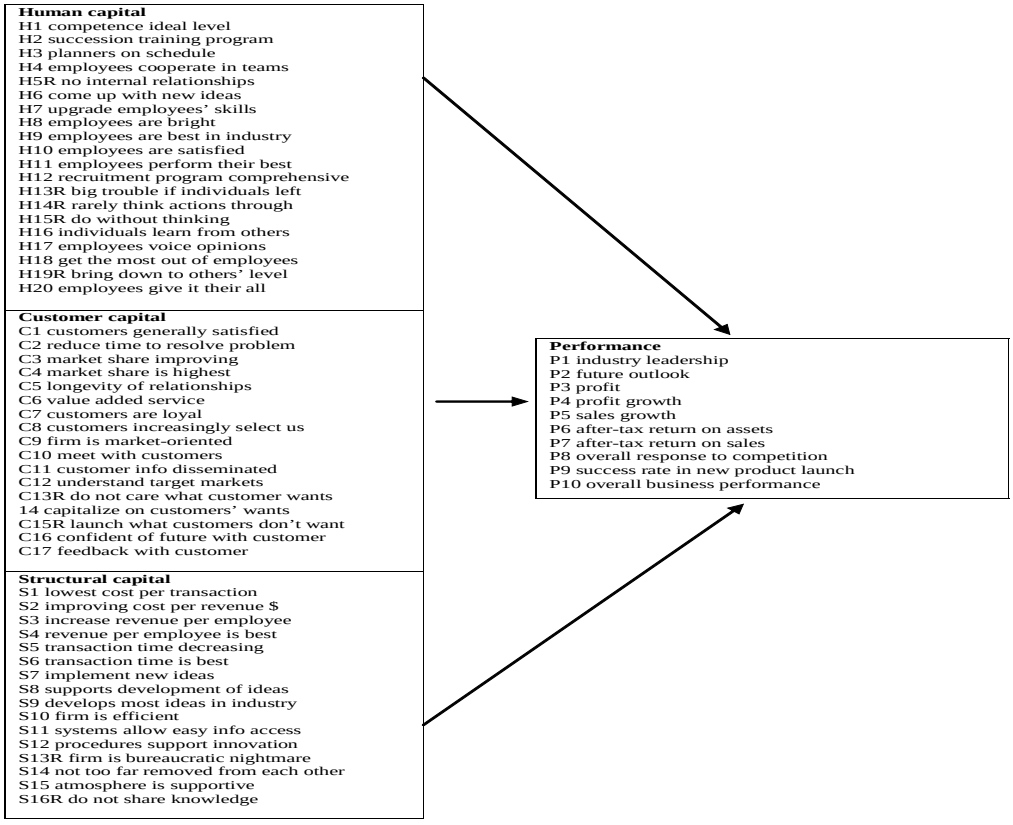
Source: Kaplan & Norton, 2004



Source: Lev, 2001

The major part of existing research focuses on the relation between IC and its sub-domains and the firm's financial performance (Lev, 2001; Kamiyama, Martinez & Sheenan, 2004; Canibano & Sanchez 2003; Bornemann, Knapp, Schneider & Sixl, 1999; Azofra, Prieto, Moreno & Santidrian, 2002; Guerrero, 2002) (fig. 5).

Fig. 5 – Examples of relations between IC elements and firm performance



Source: Anskaitis & Bareisis, 2005

Ordonez de Pablos (2002) found that only structural capital has a positive and significant relationship with organizational performance. Anskaitis & Bareisis (2005) reported the results of some research (Bontis, 1998; Bontis et al., 2000, Chen et al., Youndt & Snell, 2004) focused on the relationship between IC categories and performance and summarise the most important results: they found the greatest correlation between relational capital and performance and wide variations between the structural capital and performance, which suggests that visualization of that category of IC capital is insufficiently developed or highly intimate and contextual. They also found a strong relationship between human capital and relational capital and underline the necessity to move beyond the independent analysis of each of the three categories of IC to examine the effects of their coexistence.

The major part of research focuses on the *relationship between R&D investments and performance*, by isolating the contribution provided by other assets on the firm's income, since the registration in the balance sheet of R&D expenditures is subject to well-defined accounting rules[7] and because successful investments bring extended positive effects. Griliches' research (1995) can be cited, which shows a return of R&D investments double that of investments in tangible goods; Hall's studies (1999), focused on the relationship between market value and R&D expenditure in manufacturing industries during the 1981 -1988 period, which show that a market evaluation of R&D expenditures is from 0.5 to 2 points superior to the valuation of ordinary assets; Lev's studies (2001), carried out on a sample of 80 chemical companies during the 1980-1999 period, which highlights that an additional dollar invested in R&D brought to a medium increment of two dollars in the actual and future income of a chemical company[8]. All of these researchers found differences in the relationship due to the referring industry sector (Hall, 1993). Research on this relationship reached a high degree of maturity, so researchers now are focusing on the relationship between the intensity of R&D expenditure and the future growth of a firm's performance (Chan, Karceski & Lakonishk, 2003; Levis & Anagnostopoulous, 2005). Despite the amount of research, neither markets nor manager evaluate accurately R&D investments with a resources misallocation effect (Lev, 2004). As regards R&D expenditure, since the use of profit as a performance measure does not take into account the delay of R&D in displaying its effects on the firm's profit and the estimated nature of the firm's income, some researchers prefer to use other R&D output measures, such as market values, and found a positive correlation between the investors' reaction and new R&D initiatives (Chan, Kesinger & Martin, 1992) and a positive and statistically meaningful correlation between R&D expenditures and the firm's value (Bublitz & Ettredge, 1989). Another R&D alternative output measure is the patent quotation, which is con-

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[7]…"The reason for the R&D focus of researchers is simple: R&D is the only intangible asset that is reported separately (a line item) in corporate financial statement", Lev, 2001.

[8] On the theme see also Sougiannis, 1994; Lev & Sougiannis, 1996; Aboody & Lev, 1998; Lev, Nissim & Thomas, 2002; Hemlin, 2005.

sidered an intermediate indicator (investments in R&D increase the number of patents which impacts on the firm's performance). According to Hall et al. (Hall, Jaffe & Trajtenberg, 2000), firms with a high ratio (more than 20 quotations for patent) show a 50% growth rate greater than a firm with the same R&D expenditure but a different, lower quotation ratio (see also Gu & Lev, 2001).

On the contrary, there is no systematic research on the relationship between elements of structural capital and performance, elements of relational capital and performance, elements of human capital and performance (Lev, 2001).

As regards the *relation between structural capital and value*, we can quote the research of Sadowski & Ludewig (2003) and Brynjolfsson et al. (2002). Sadowski & Ludewig, analysing German firms, found that value created by structural capital is very high and underlined the social danger of an underestimate of structural capital. Brynjolfsson et al. (2002), on the basis of a research carried out on 1200 firms during the 1987-1997 period, discovered that: a) each additional dollar of information capital is related to more than 10 dollars of market value; b) firms characterised by a high utilization of informatics are those characterised by a high use of team work, by decision spreading and by high investments in training; c) firms which have these features and have a high information capital are highly rated by the market (see also Lev & Radhakrishnan, 2003).

As regards *relational capital and value*, researches focused both on input indicators (such as customers' acquisition costs) and output indicators (such as registered trademarks or measures of on-line traffic or measures of customer satisfaction). The first research type includes the researches of Amir & Lev (1996) on telephony sector industries, which indicates that the commissions paid for clients' acquisition are considered an investment by the stakeholder, and the researches of Demers & Lev (2000), which show that Internet clients' acquisition was considered an asset in 1998 and 1999, but was considered a cost in 2000. The second research type includes the research of Ittner & Larcher (1998), which demonstrates that various measures of customer satisfaction are associated with the firm's value, the researches of Barth et al. (1998), which discovered that estimated trademark values published by Financial World are associated with market values, the research of Seetamraju (2000), which, analysing a sample of firms that have acquired trademarks from other firms, found a positive and statistically significant reaction of investors to the acquisition announcement and the research on Internet traffic indicators of Trueman, Wong & Zhang (1999), Hand (2000) and Demers & Lev (2000), which show a positive correlation between those indicators and the market value of internet companies

As regards *human capital and value*, the research of Black & Lynch (1996) and Smith (2001) can be cited on the relationship between training investments and productivity growth. Black & Lynch found that a growth of 10% in the medium level of education of firm workers brought a productivity growth of 9% in the manufacturing industries and 13% in other types of firm.

Smith's research in Australia shows positive returns in training; returns were higher when training focused on specific business problems or were related to innovation and technological change. The research of Huselid (1995) and Becker & Huselid (1998) demonstrate, on the basis of survey results, the existence of a positive link between human resources management practices and the firm's market value, whilst Cappelli & Neumark (1999) highlighted that these practices, besides increasing the firm's productivity, make the labour cost for employee higher, so the overall effect is neutral.

Lev (2001) highlights firstly, that research on structural capital takes into consideration almost exclusively information capital as a component of organizational capital, (personal computers reflect the firm's investment in organizational change, which is the value of structural capital); secondly, that researchers on relational capital focused almost exclusively on trademarks and internet traffic indicators; thirdly, that researchers on human capital focused on the relationship between training investments and the growth of the firm's productivity; finally, he stresses the key role of information provided by firms: if they are lacking, the judgment on IC value has to be suspended.

5 – Concluding remarks

The paper's main aim is to study the link between IC and firm performance. From a study on IC and performance literature, a clear definition of intellectual capital and firm performance emerges; from the analysis of empirical studies carried out, the evidences of such a link is found, even if the outcomes of research are very fragmentary and hardly comparable, since researchers used different models and focused on the relationship of specific IC elements or IC category and the firm's performance rather than concentrating on a construction of a model which relates IC indicators and the firm's performance.

The results show that there is systematic research only for R&D expenses, which is the only intangible asset that is reported separately in corporate financial statement (Lev, 2001); the research on organizational capital shows the relevance of this IC category on firm value, but a lot of questions lie in shadow (exactly, which organizational IC elements contribute to the firm's value? In which circumstances? How can this contribution be strengthened?). Even research on customer capital shows the utility of IC relational indicators, but research is behind regarding R&D. Human capital research is so scarce that it is not possible to give a judgement (Lev, 2001).

Any attempt to identify a relationship between intangibles and value cannot ignore that:

1) there cannot be a direct relationship between a single intangible and the creation of the firm's value: the value creation process requires an interaction between the IC components and

between financial and intellectual capital (Sveiby 1997; Edvinsson & Malone 1997; Lev & Daum, 2004);

2) the intangibles contribution to value creation is not only actual but above all *potential*, that is, investing in intangibles contributes to the creation of the firm's future value (Chiucchi, 2004; DMSTI 2003; Meritum 2002);

3) the value of a firm cannot be identified as the sum of the values of single intangibles, but as the results of initiatives and activities which combine the different, tangible and intangible, resources of the firm (PRISM Report, 2003)[9].

In any case these attempts are valuable, because they try to demonstrate, instead of assuming, that intangibles measurement is worthwhile for the firm (Guthrie, 2001; Lev, 2001; Marr & Gray, 2002); the author believes that this is the direction for future research to take, rather than focus on or ideate new measurement models while improving existing ones.

The author also believes that in the IC field the value term has more to do with the *value creation process* than with a value determination (Mouritsen, 2000). In a managerial perspective, it is not important to find a number, but to understand how a firm creates/destroys value, how IC contributes to the firm's value creation; in order to highlight the firm's value creation process, researchers have to assume an inside perspective (Guthrie, Cuganesan & Boedker, 2005).

The main limit of this kind of analysis is that it can be carried out only by having access to internal data, the main strength is that only an inside analysis can allow researchers to understand the firm's value creation process data: research can make progress only if firms provide systematic and reliable (audited) information on their intangibles. By the way, there is a long way to go, regarding the firm's social and cultural attitude (Lev, 2001) and intellectual capital measurement problems, since Intellectual Capital can be seen as a bundle of intangible resources and activities, linked by relationships of concomitant cause and multiple effects, in which intangibles do not produce value per se, but only interact with other intangible and tangible resources within the internal management firm processes (Lev & Daum, 2004).

The empirical relationship between IC and performance has been investigated in various countries using a number of different models, however, the author thinks there is a need and an opportunity 1) to investigate a model which relates the main IC indicators and the firm's performance; 2) to investigate for the relationship between IC and financial returns in Italy, because, to the author's knowledge, no Italian study has tested this relationship.

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9 The firm's value is more than the sum of a single elements' value. This concept is related to the properties of IC and firms as systems. The character of the firm as a system was already well recognised as demonstrated by the writings of Zappa (1927); Ceccherelli (1955); Bertini (1991); Giannessi (1979), Amodeo (1967).

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