THE VALUE RELEVANCE AND MANAGERIAL IMPLICATIONS OF INTANGIBLES: A LITERATURE REVIEW[1]

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Abstract

This paper presents a survey of the economics, business and accounting literature, which has focused on the analysis of intangibles. First, it addresses the analysis of the economic nature of intangibles, discusses several alternative definitions, and reviews the classifications proposed in the literature as well as the accounting criteria for the recognition, valuation and depreciation of intangible assets. Then, a discussion on the relevance of specific intangible assets for firm valuation is presented, with special attention to the risks of underestimating the value of intangibles. The paper then delves on the managerial implications of intangibles, discussing the relevance of organizational innovation and the strategic management of intangibles. Finally, several proposals for the disclosure of information on intangibles are reviewed.

> We cannot have financial reporting and disclosure constraints that slow the pace of progress in capital markets, decrease the rate of reduction in the cost of capital, or limit innovation. The next step collectively is ours.
>
> Steven M.H. Wallman (1995, p. 89).

1. INTRODUCTION

The fundamental objective of Financial Accounting is to provide users of financial statements with useful information for the purposes of efficient decision making. According to the FASB (1978, par. 34), financial reporting should provide information that is useful to present and potential investors and creditors and other users in making rational investment, credit, and similar decisions. Consequently, any event that is likely to affect a firm's current financial position or its future performance should be reflected in its annual accounts. Investors and creditors have traditionally been considered as the main users of accounting information. Since they usually have no direct control on the process of preparation of accounting statements, financial accounting standards have been developed in order to ensure that stakeholders are provided with relevant, reliable and timely information (representing the true and fair view of the firm's financial position), on the basis of which they can make efficient allocation decisions (FASB, 1980).

Within the firm, accounting information is also essential for efficient decision making; managers need timely and reliable information in order to carry out the budgeting process and implement control mechanisms. The traditional accounting model has become insufficient because innovative activities are not considered as strategic variables. Technological development is a challenge for accounting not only in the area of financial reporting, but also in the realm of management control (Cañibano and Sanchez, 1992).

During the last two decades we have progressively moved into a knowledge-based fast-changing, technology intensive economy in which investments in human resources, information technology, research and development, and advertising have become essential in order to strengthen the firm's competitive position and ensure its future viability. As Goldfinger (1997) states, the source of economic value and wealth is no longer the production of material goods but the creation and manipulation of intangible assets. In this scenario, firms feel a growing need to make investments in intangibles, that in most cases are not reflected in the balance sheet but on which the future success of the company is based to a large extent.

As a consequence, financial statements are becoming less informative on the firm's current financial position and future prospects (Lev and Zarowin, 1998). A sign of the loss of relevance of accounting information is the increasing gap between the market value and the book value of equity of most companies in most countries.[2] Lev and Zarowin (1998) document a significant increase in the market-to-book ratio of US firms, from a level of 0.81 in 1973 to a level of 1.69 in 1992 (which means nearly 40% of the market value of companies is not reflected in the balance sheet). In their view, this represents not only a revolutionary change in the process of economic value creation, but also a decline in the value relevance of traditional financial measures. In other words, the traditional accounting model, developed to fit firms whose activity is primarily of a manufacturing or mercantile nature, needs to be modified or at least broadened to reflect intangibles, so as to enhance the usefulness of accounting information. According to Vickery and Wurzburg (1992), there are strong arguments for rethinking the measurement and treatment for a range of intangibles. Among the new challenges facing accounting standard setters are how to account for alliances and partnerships, the use of financial instruments and investments in intangible assets (Swieringa, 1997).

The growing number of mergers and acquisitions, both at the domestic and transnational level, is another factor that has highlighted the relevance of goodwill and the problems of how to account for it (Gray, 1991). Camino and Trecu (1995) state that

[2] The evidence presented in Eccles and Mavrinac (1995), Ely and Waymire (1996), Ramesh and Thiagarajan (1996), Amir and Lev (1997), Collins, Maydew and Weiss (1997), Francis and Schipper (1997), García-Ayuso, Monterrey and Pineda (1997), and Lev and Zarowin (1998), indicates that (i) the value relevance of accounting information has decreased significantly in the last few decades and (ii) its association with stock prices differs significantly across industries, firm growth categories and firm size.

a significant number of the mergers, acquisitions and joint ventures taking place at the international level are primarily driven by the intention to exploit a competitive advantage based on the existence of technology, knowledge and other intangible assets. The existence of significant differences in the criteria adopted for the recognition, measurement and depreciation of intangible assets across countries, may affect the ability of certain firms to compete for capital in financial markets. Full expensing of goodwill would penalize firms operating in some countries when competing with a foreign company for a business acquisition, as its reported earnings would be lower after the combination (Johnson and Tearney, 1993).

Managers need to identify their firms' fundamental value drives, enhance their impact on the future performance of the organization, and implements controls to protect them. Among those value drivers, intellectual capital is fundamental.

In order to assist the managers of business enterprises and their providers of capital in their decision making processes, standard setting bodies currently face the need to develop guidelines for the identification of intangible elements, a set of criteria for their valuation, new standards for financial reporting, and guidelines for the measurement and successful management of intangibles within the firm.

This paper intends to provide a starting point in that direction by reviewing the literature published to date in four areas: (i) the economic nature, definition and classification of intangibles, (ii) the value relevance of intangible assets and the implications of their underassessment for investment and lending decisions, (iii) the managerial implications of intangibles, and (iv) the ways in which information on intangibles should be provided in companies' financial statements.

The following section contains a discussion on the economic nature of intangibles, introduces the definitions proposed in the accounting literature, discusses the issue of the recognition, measurement and depreciation of intangibles, and presents several attempts towards their classification. Section three delves on the relevance of some intangibles (R&D and advertising, brands, patents and covenants not to compete, and Intellectual Capital) for the purposes of firm valuation, and discusses the risks involved in the underestimation of the value of intangibles. Section four focuses on the managerial implications of intangibles, paying special attention to the role played by organizational innovation and the strategic management of intangibles. Section five discusses the need to disclose information on intangibles in the firms' annual accounts

and comments on several proposals for the development of the accounting model in order to improve the quality and extent of the disclosure of information on intangibles in the annual accounts. Finally, section six summarizes and presents some concluding remarks.

2. THE ECONOMIC NATURE OF INTANGIBLES

Intangibles have been extensively analyzed in the economic literature within the framework of the economics of innovation[3]. However, there seems to exist little agreement on issues such as their economic nature, definition and classification, the way in which they affect the value of companies, or the criteria that should be adopted for their recognition, measurement and depreciation.

Neoclassical theories have traditionally seen firm productivity and economic growth as a consequence of growth in labour and capital (Solow, 1956) and attempt to associate the growth not explained by increases in these two production factors in terms of techological progress and intangible investments (Denison, 1967).

Ducharne (1998) summarizes the contribution of four main theories to our understanding of the process of economic growth and development. The human capital theory (Schultz, 1971; and Becker, 1975) suggests that human capital is the most important production factor in terms of productivity increases and that the key issue to understand the firrms performance is the complementary nature of human resources. Innovation (technological change) theory sees investments in innovation as the main cause of growth, as competitiveness is achieved by means of investments in R&D and other intangibles (Freeman, 1982). The theory of intellectual investment (Romer, 1986; Lucas, 1988; Barro and Sala i Martin, 1995) is based on the premise that efficiency is achieved by the mobilization of resources in order to appropriate technological and marketing opportunities. Finally, the "new growth theories" attempt to explain the knowledge based economy (David and Foray, 1995) as a stage of an evolutionary process, in which intangible investments are among the fundamental determinants of economic growth. Endogenous growth theory sees the accumulation of knowledge as

[3] Cohen and Levine (1989) provide an extensive review of the economic literature published in this area of research until the end of the 1980's.

the main source of economic growth taking the allocation of limited resources as its starting point, whereas evolutionary approaches understand the firm as a hierarchy of activities ruled by "routines" (Nelson and Winter, 1982) and consider progresses of learning and discovery as essential (Dosi, 1992).

Werner, Hammerer and Schwarz (1998) state that evolutionary theories provide an appropriate (albeit not complete) theoretical framework for the understanding of the process of economic growth and development. However, they acknowledge that these approaches have a major limitation, as their practical implementation is not easy.

Neoclasical approaches have usually analyzed technological change using the Schumpeterian trilogy that divides the technological change process into three stages: invention (generation of new ideas), innovation (development of new ideas into marketable products) and diffusion (disclosure of the products across the market). Schumpeter (1942) held stated that innovation is a fundamental source of wealth. Currently, more than ever, firms need to allocate growing amounts of resources to R&D and other innovative activities, and invest in their human resources in order to achieve higher levels of knowledge and technological improvement, which allow them to exploit competitive advantages. Thus, it is not surprising that in developed economies, intangibles have become the focus of attention of investors and creditors, managers, policy makers and researchers.

The most commonly used indicators of technological activity and innovation are the amounts invested in R&D (an input measure) and the number of patents granted (an output measure). The increase that business-funded R&D has had in OECD countries in real terms, and as a percentage of GDP since the late 1960’s, provides support to the view that investments in innovation have gained relevance in developed economies. Patel and Pavitt (1995), report an average increase of over 100 per cent between 1967 and 1990 for the five major OECD countries, with an outstanding 900 percent increase in the case of Japan. Recent analyses based on the Oslo Manual (OECD, 1992b and 1996a; and European Commission, 1996) have shown that R&D is only one of the activities that can be undertaken in order to innovate: many others such as acquisition of disembodied technology, marketing, software development, training, design, etc. are activities that may lead to the implementation of technologically new or improved products or processes.

Investments in innovation are mainly intended to acquire future earning power, and as such, may be considered as assets susceptible of recognition and disclosure in financial statements. The economic rationale underlying the classification of an intangible as an asset lies in its potential for generation of future profits. From an economic point of view, there is no theoretical basis upon which a clear distinction may be made between intangible and tangible assets. For both represent future economic benefits for the firm, which result from past transactions or events. However, according to the accounting standards enforced in most countries, intangible investments (although contributing to generate future income) are not reflected in the balance sheet but expensed in the income statement. Therefore, financial statements fail to provide a true and fair view of the firm's (nonphysical) position.

In a large number of industries, business enterprises are nowadays feeling a growing need to undertake important investments in their human resources, new technology, research and development and advertising, in order to pursue new process and product innovation as well as to develop and maintain their broader capabilities to assimilate and exploit externally available information (Cohen and Levinthal, 1989). Therefore, intangible investments currently appear to be one of the fundamental concerns of business enterprises which are willing to gain (or maintain) a competitive advantage[4].

For young innovative firms in highly competitive environments, the most important long-term assets are intangibles such as the knowledge of its employees, technology under development, manufacturing arrangements, and marketing and distribution systems, all of which are absent from financial statements (Brennan, 1992).

In sum, despite not reported in companies' financial statements (mainly due to the lack of ability of the accounting standards issued to date, to prescribe how to adequately do so), intangibles are among the fundamental determinants of the value of business enterprises. Currently, most intangibles are only revealed indirectly by incremental economic performance that is not accounted for by available data on employment and tangible investment (Mortensen, Eustace and Lannoo, 1997).

[4] Differences in intangible-intensiveness are likely to exist across industries, as well as within industries as a result of differences in firm size Cohen, Levinthal and Mowrey (1987).

2.1. The Definition of Intangibles

According to the *SFAC* 5 (FASB, 1984), the balance sheet does not report all assets and liabilities of the firm, but reflects only those meeting specific recognition criteria. The critical issue in reporting intangibles is to determine what intangible assets are, that is, under what circumstances an intangible element may be considered as an asset for the purposes of accounting recognition and disclosure. For an item to be included in the balance sheet, it must match four requirements: First, it must qualify as an element of financial statements, either asset or liability. Second, it must have a reliably measurable relevant attribute. Third, the information provided by the item must make a difference in users decisions; and fourth, the information must be representationally faithful, verifiable and neutral.

Intangible assets are often identified (with goodwill) as the excess of the cost of an acquired company over the value of its tangible net assets. In most cases, intangibles are simply defined as (capital) assets that lack physical substance but which are likely to yield future benefits. According to the FASB's (1985a) *SFAC* 6, par. 25, assets are probable future economic benefits controlled by and accruing to a particular entity as a result of past transactions or events. Although there seems to be a general agreement in the accounting community that whenever those probable future economic benefits lack physical form, they should be considered as intangible assets, there does not seem to be any widely accepted precise definition of intangible assets in the accounting literature.

A major problem with intangible assets is that they are often difficult to identify separately, and thus, may not match one of the fundamental requirements for accounting recognition. It is difficult to separate intangible assets from other intangible assets and from current expenditures. Moreover, intangibles are nonphysical in nature and may be considered not to follow the same patterns of depreciation as tangible assets. Therefore, some as Hendriksen and van Breda (1992). argue that standard valuation procedures developed for tangible assets may not be applicable.

Intangible assets are divided into two main categories: goodwill and other identifiable intangibles. There are two basic views of goodwill: it may be understood as the consequence of a firm's above-normal ability to generate future earnings, or as a set of assets controlled by an acquired company but not reported in its financial statements.

Identifiable (separable) intangibles are those which can be sold or acquired separately (NZSA, 1988, par.4.2). However, certain standard setting bodies such as the ASB, support the idea that all intangibles should be kept under the umbrella of goodwill, on the grounds that it is unlikely that they can be sold without selling the whole business (Scicluna, 1994).

Napier and Power (1992) make an interesting distinction between *entry separability* and *exit separability*. Entry separability means that the asset can be identified as it is produced or acquired by a firm: it therefore requires that the costs of production or acquisition can be accurately assessed and identified with the asset. This idea is present in all accounting standards such as ED52, (ASC, 1990), that require the historical cost of an intangible asset to be ascertainable, as a basic premise for recognition. On the other hand, exit separability implies that the asset can be traded separately from other intangibles of the firm or from the firm as a whole. This is the notion of separability underlying SSAP 22 (ASC, 1989, par.27).

These and other issues are in the center of the current debate[5] on intangibles. It appears that the a generally accepted definition of Intangible Assets should have been the necessary starting point of that debate. Although there are certain items (such as goodwill, intellectual capital, human capital, organizational innovation, investments in R&D and advertising, brands and patents) which are generally considered as intangible assets of firms, there seems to be little agreement in the literature as to what exactly intangibles are, when they should be recognized, whether or not they should be reported in the financial statements, how they should be measured, accounted for and depreciated.

Intangible assets are usually defined (as in Belkaoui, 1992), as assets which lack a physical substance, but result from legal or contractual rights and are likely to produce future benefits. Belkaoui distinguishes two main types of intangible assets: identifiable intangible assets such as patents, and unidentifiable assets, such as goodwill. As White, Sondhi and Fried (1994) state, *in most cases, goodwill and other intangible assets arise as residuals in purchase method acquisitions, and they represent the portion of the*

[5] Proofs of the current interest in intangibles are the papers presented at the International Conference on Industrial Competitiveness in the knowledge-Based Economy held in Stockholm in February, 1997: for example, Mortensen *et al.* (1997) present a comprehensive analysis of the relevance of intangibles in Europe, Rouhesmaa (1996) and Drake (1997) analyze the relevance of human resource accounting and Johanson (1997) discusses the profitability of intangible investments.

purchase price that cannot be allocated to other, tangible assets. Goodwill represents the premium paid for the target's reputation, brand names, or other attributes that enable it to earn an excess return on investment, justifying the premium price paid. Hence the name of goodwill.

The Australian intangibles exposure draft, AARF ED 49 (1989) states that intangible assets means non-monetary assets without physical substance and includes but is not restricted to brand names, copyrights, franchises, intellectual property, licenses, mastheads, patents and trademarks. In our view this definition is not adequate, as non-monetary assets without physical substance include tangible assets such as prepayments and long-term investments. Hendriksen (1982) stresses that the lack of physical substance may not be considered as the main difference between tangible and intangible assets. Conversely, he suggests that the most important single attribute of intangibles is the high degree of uncertainty associated to the future benefits expected from them.

The Intangibles Research Center of the Stern School of the New York University provides a broad definition of intangibles as *nonphysical sources of future economic benefits to an entity or alternatively all the elements of a business enterprise that exist in addition to monetary and tangible assets*. They also provide a narrower definition of intangibles as *nonphysical sources of probable future economic benefits to an entity that have been acquired in an exchange or developed internally from identifiable costs, have a finite life, have market value apart from the entity, and are owned or controlled by the entity*.

Egginton (1990) proposes that tangible assets are those which entail legal rights in relation to specific persons (real or corporate) as well as assets with a physical existence. He defines intangible assets as those which either entail legal rights in relation to persons at large (such as patents or trade names usually referred to as separable intangible assets), or entail expectations of economic benefits which carry no legal right (goodwill).

In 1992, the OECD suggested intangible investments cover all long-term outlays by firms aimed at increasing future performance other than by the purchase of fixed assets. In its 1992 National Accounts, the French Statistical Institute defined intangible investment as those business expenditures, which develop the production capacity and

enhance the value of the firm by creating a capital which could be depreciated or long-term tradable assets.

Also in 1992, Arthur Andersen proposed a definition of intangibles as resources controlled by the enterprise which are non physical in nature, capable of producing future economic net benefits and protected legally or through *de facto* right.

Stickney and Weil (1994) define intangibles as assets which can provide future benefits without having physical form. Among intangible assets, they include investments in research and development, patents, advertising and goodwill.

In the final version of IAS 38, the IASC (1998) defines intangible assets as non-monetary *assets without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes: (a) that are identifiable; (b) that are controlled by an enterprise as a result of past events; and (c) from which future economic benefits are expected to flow to the enterprise.* This definition, which is the central point of IAS 32, is very restrictive (and rather disappointing), as it explicitly excludes from the scope of the standard (and thus does not consider as intangible assets) some of the firms' most significant intangible investments, such as resources allocated to human resources and advertising.

A much broader view on intangibles is provided by Hendriksen and van Breda (1992), who argue that they arise when cash (or its equivalent) is expended on services. Accordingly, together with *traditional intangibles*, they list a number of *deferred charges,* which in their view have the same nature.

Vosselman (1998) proposes an operational definition of intangible investment as *comprising the current capital expenditure for (in)tangible products that became available in the period under review and that remain in use for more than one year. Notwithstanding, he acknowledges that the distinction between investment and operating costs is difficult for intangibles, as they are usually related to services.*

A fundamental question remains unanswered: if intangible assets are a relevant determinant of the value of companies, why are they not reported by all corporations and only arise in certain acquisitions? One among all the possible answers might be that we still have not proved capable to develop a generally accepted set of guidelines for the identification and measurement of intangibles and the disclosure of relevant (and not only) information on the financial position of the firm.

In sum, although most definitions seem to agree in that intangible assets are sources of probable *future economic profits*, *lacking physical substance*, which are *controlled by a firm* as a result of *previous events or transactions* (self-production, purchase or any other means of acquisition), there is still a need for a generally accepted definition and classification of intangible investment. The next section is devoted to this latter issue.

2.2. Classifications of Intangibles

The classification of intangibles is an issue that has received scarce attention from academic researchers until rather recently. However, in the last few years, many attempts have been made in order to develop theoretically consistent classifications of intangibles, none of which appears to have gained wide acceptance to date.

Recent work has stressed the importance of understanding that the accounting notion of assets is not sufficient to embrace the concept of intangibles. Moreover, most classifications include elements such as organizational knowledge and customer loyalty or satisfaction, which are non-financial in nature, and therefore difficult to quantify. As a result, it seems necessary to devote efforts to the development of a comprehensive concept of intangibles and both, financial and non-financial indicators of the existence and value of intangibles.

Obviously, significant differences exist between some of the classifications. This section explores some of the classifications proposed in the literature and identifies a number of common factors in order to provide a basis for the development of a consensus.

According to Hendriksen and van Breda (1992) most assets result from situations where cash has been expended, but the related expense has not been recognized in the income statement. Thus, they consider intangible assets may be classified into *traditional intangibles* and *deferred charges* (see figure 1).

Several national and international standard setting bodies and institutions have recently made significant efforts in order to develop a classification of intangibles. As a result of the very important work done by the OECD called the TEP Programme (OECD, 1992a) a new agenda for the development of indicators was established. The need to develop indicators for intangible investments was in that agenda. Investments

were classified into: (1) Physical investment (hardware), software; (2) Intangible investment in technology: R&D, patents and licenses, design and engineering, scan and search; (3) Enabling intangible investment: worker training, information structure, organizational structure; (4) Market: exploration, organization. It was noted how different professionals (statisticians, accountants, etc.) had their own concept of intangible investment and how all of them had to be taken into consideration in the future measurement work.

Figure 1: Classification of Intangibles by Hendriksen and Van Breda (1992)

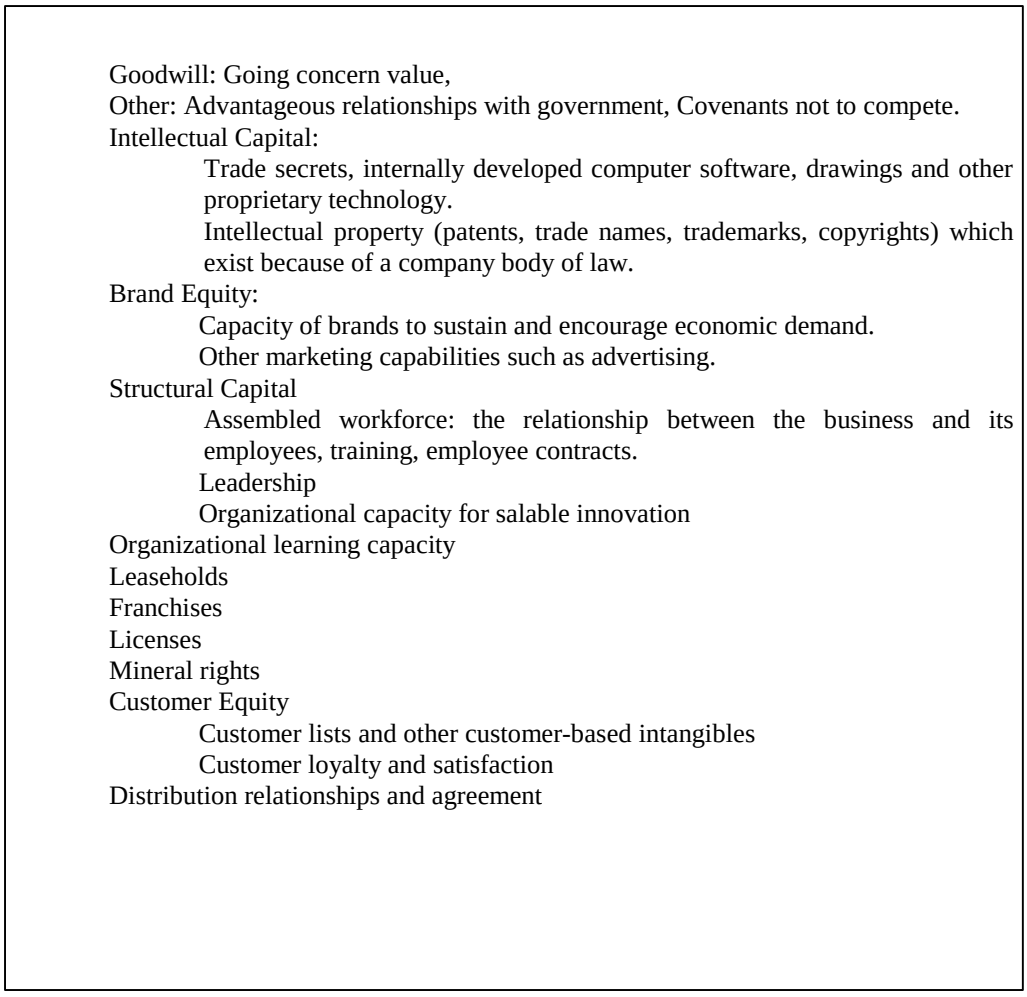
Traditional Intangibles	***Deferred Charges***
Brand names	Advertising and promotion
Copyrights	Author's advances
Covenants not to compete	Computer software development costs
Franchises	Debt issurance costs
Future interests	Legal costs
Goodwill	Marketing research
Licenses	Organization costs
Operating rights	Preopening costs
Patents	Relocation and rearrangement costs
Record masters	Repair
Secret processes	Research and development costs
Trademarks	Start-up costs
Trade names	Training costs

Van Wieringen (1997) proposed a classification of intangibles based on the balanced scorecard concept for professional education. On the other hand, EUROSTAT is presently performing a study for statistical reasons. They have identified ten categories of intangibles; (1) R&D, (2) acquisition of intellectual property rights (patenting) and licensing, (3) acquisition of industrial property rights, (4) advertising and other marketing, (5) acquisition and processing of information, (6) acquisition of software, (7) reorganization of management of an enterprise, (8) reorganization of the accounting system of an enterprise, (9) means devoted to dealing with changes in legal,

fiscal, social, and economic government policies, (10) other investments in innovation of products or processes of the enterprise.

A number of classifications have been proposed by private companies, which are often based on the balanced score card concept. During the last few years, some Scandinavian companies have disclosed information on intangibles in their annual accounts. In a supplement to its annual report, Skandia presents a framework for understanding the value creating processes within the organization. In their view, market value is driven by financial capital and intellectual capital. The latter, is determined by human capital and structural capital, which in turn is based on customer capital and organizational capital. Finally, organizational capital is grounded on innovation capital and process capital.

Figure 2: A Tentative Classification of Intangibles by The Intangibles Research Center at NYU.



Researchers and some of the largest accounting firms are also playing an important role in the quest for a suitable classification of intangibles. The Ernst & Young Center for Business Innovation identified eight key non-financial measures which investors consider as determinants of the value of a firm: Execution of corporate strategy, quality of strategy, ability to innovate, ability to attract talented people, market share, quality of executive compensation, quality of major processes, and research leadership.

Figure 3: Classification of Intangibles by Hammerer (1996).

	TECHNOLOGICAL KNOWLEDGE	**ECONOMIC COMPETENCE**	**EXTERNAL**
STRATEGIC LEVEL	Research Further Education Technological Patents	Further Education Administrative Market research	Public Relations Advertising
OPERATIONAL LEVEL	Licenses Software	Software Technology	Administration

A significant effort towards the understanding of intangibles and the enhancement of the usefulness of financial statements is currently being made at the Stern School of business of the New York University, by means of the recently created Intangibles Research Center. Figure 2 presents the tentative classification of intangibles which is shown by the Center

Figure 3 presents a classification developed by Hammerer (1996) based on evolutionary theories in economics, which was later used to illustrate the distribution of intangible and tangible investments over the product life cycle.

Mortensen, Eustace and Lannoo (1997), propose a four category classification of value-relevant intangibles: innovation capital (R&D), structural capital (intellectual capital[6] and knowledge assets, organizational coherence and flexibility, and workforce skills and loyalty), executory contracts (operating licenses and franchises, media and other broadcast licenses, agricultural and other production quotas in regulated industries, maintenance, servicing and environmental liabilities, outsourced operations of over a year duration, material employment contracts, and risk-hedging financial instruments, derivatives, etc.), market capital (brands, trademarks and mastheads), and goodwill.

Guilding and Pike (1990) classify intangible marketing assets into four categories, on the basis of a conceptual representation of the series of events that lead to the creation of a competitive advantage: Value creator (advertising, product development and other marketing support), Marketing assets (trademarks, brands, entry barriers and information systems), Value manifestation (image, reputation and premium price), and the synthesis of marketing assets: competitive advantage.

Werner, Hammerer and Schwarz (1998) strongly criticise previous attempt to classify intangible investments (such as that by the OECD, 1992), on the grounds that they usually include heterogenous groups of intangibles, fail to accurately diferentiate between tangible and intangible assets, do not apply the concepts of stock and flow of intangibles and lack theoretical fundation. Based on the evolutionary theory of economic growth, propose a classification of intangible investments into seven (overlapping) core components: research and experiential development, education and training, software, marketing, mineral exploration, licences, brands and copyrights, and patents. Moreover, they suggest five supplementary categories of intangible investments: development of the organization, engineering and design, constructions and use of databases, remuneration for innovative ideas, and other human resource development (not including training).

Young (1998) also suggested the existence of six core components of intangible investments: computer linked, technology and production, human resources (formal and

[6] Intellectual capital is defined by Brooking (1997) as the difference between the book value of the company and the amount of money someone is prepared to pay for it. She then distinguishes four categories of intellectual capital: assets which give the company power in the market place, those representing property of the mind, those which give the organization internal strength and those derived from the people who work in the organization.

informal training) organization of the firm, external (marketing and sales), and intustry specific (mineral exploration, entertainment, literary and artistic originals, etc.):

As stated earlier; despite all the efforts discussed above, there does not appear to be a generally accepted definition or classification of intangibles. Whether or not consensus may be achieved depends to a large extent on the possibility to carry out a broad and thorough discussion on the economic nature and different characteristics of intangibles, which should lead to the identification of a reduced set of common factors that may eventually become generally accepted as fundamental characteristics of intangibles. Among those common (basic) characteristics, we have identified the following: intangibles may be either assets or liabilities (sources of probable future economic profits or losses); they lack physical substance, but are a fundamental part of the value of the firm; they may be financial or non-financial in nature; financial intangibles may either be investments (cash outlays) or deferred charges; firms may either acquire or produce them internally.

Academics and standard setting bodies are currently faced with the challenge of undertaking joint efforts towards developing an appropriate definition of intangibles and a coherent classification which are the necessary starting point for the development of a set of valuation criteria and guidelines for financial reporting of intangibles.

2.3. Accounting for Intangible Assets

The debate on how intangible assets should be accounted for and reported in the financial statements has been present in the literature for over a century (Diksee, 1897; Leake, 1914; Canning, 1929).

Disclosure of information on intangible assets requires the development of a theoretical basis upon which recognition and measurement criteria may be set. Traditionally, accountants have followed a deductive approach to the problem, mainly based on two income theories: The valuation approach, which is balance sheet oriented and relies on the assumption that a true economic value can be associated with each element in the financial statements and that true income can be estimated as the difference between the net value of the firm’s assets at two different points in time. On the other hand, the transactions approach, which is profit and loss account oriented, builds up accounting numbers by matching transaction costs in activities to produce

activity costs. Hodgson, Okunev and Willet (1993) suggest that an activity cost theory of accounting (the Statistical Transactions Theory) provides a consistent basis to understand the nature of accounting numbers and the notions goodwill and other intangibles.

2.3.1. Recognition and Measurement

The central issue in recognition is the judgment of what are *probable future economic benefits*. The FASB (1985a) states that *probable* refers to *what can be reasonably expected or believed on the basis of available evidence of logic*. Therefore, if there is a *reasonable expectation* that an investment in an intangible element will generate future economic benefits, it should be recognized as an (intangible) asset and reported in the financial statements.

Some empirical studies have investigated the relationship between R&D and advertising outlays and future earnings. Both, Bubblitz and Ettredge (1989) and Hall (1993) have found that while R&D investments appear to be related with subsequent earnings, the impact of advertising is not long-lived and is limited to an average of two years. These results provide a basis to conclude that R&D outlays should be capitalized and amortized, whereas advertising should be expensed. Although some recent studies claim to have found evidence of a long long-lived impact of advertising on future earnings, thus providing support for capitalizing such expenses, Landes and Rosenfield (1994) suggest that is basically due to firm-specific factors. They developed a model of the firm's advertising decision in which advertising and product quality are considered as complements. Within the framework of their model, failing to control for differences in firm-specific factors positively correlated with the return to advertising will understate advertising's direct effect on sales and overstate its durability. Their empirical results indicated that the impact of advertising decreased significantly when firm-specific factors were held constant.

Stickney and Weil (1994) point out two main problems associated to the recognition and measurement of intangibles. First, whether they should be capitalized on the grounds that they represent an investment that is likely to generate sufficient future benefits, or they should be expensed if they produce no future benefits. Second, how they should be amortized over their estimated service life.

Cost is the usual basis for the recognition of intangibles. In its Research Bulletin No. 43, the AICPA established that the initial amount assigned to all types of intangibles should be cost. In the case of non-cash acquisitions, as, for example, where intangibles are acquired in exchange for securities, cost may be considered as being either the fair value of the consideration given or the fair value of the property or right acquired, whichever is the more evident. Although the value of fixed assets may be reviewed (ASC, 1987), goodwill has never been considered as suitable for it.

Despite the existence of claims that intangibles should be treated as any other tangible asset (Lev and Zarowin, 1998), some argue that there are significant differences between tangible and intangible assets which make it necessary to apply different criteria for the recognition and valuation of the latter (Hendriksen, 1982). Proponents of this view argue that the main differences between intangible and tangible assets are that the former do not have alternative uses, are not always separable (as in most cases they only have value in combination with other firm's assets), and their recoverability is subject to a great degree of uncertainty. Hendriksen (1982) states that the uncertainty associated to the future benefits expected from certain intangible assets impedes their recognition, as control on the asset is the condition *sine qua non*. Therefore, he suggests that the criteria used for the recognition and valuation of tangible assets may not be of application. It is precisely the need for a reasonable certainty in the measurement and verification of the magnitude of an asset as measured by the accounting model, what is considered as a major limitation for the recognition of intangibles as assets.

Conversely, Lev and Zarowin (1998) consider intangible assets should be accounted for following the same methods applied for tangible elements. In fact, According to the SFAC 6, paragraph 25, the FASB (1985a) considers the ownership or control of the future benefits as the criteria for reportable intangibles. If the emphasis is on the ownership of the benefits (and that it is considered to imply ownership of the asset), then intangible assets such as human resources could be recognized, for although the firm does not own its employees, it does control the future benefits they will generate. There is a growing new trend in accounting research, which seems to be providing strong support to Lev and Zarowin's approach towards accounting for and reporting intangibles.

However, the dominant view on the recognition of intangibles and their inclusion in the financial statements in most countries seems to be still close to that held

by Hendriksen and van Breda (1992). In their opinion, intangibles must satisfy the criteria for recognizing all assets (*SFAC* 5), that is, they should meet the appropriate definition, and be measurable, relevant and reliable.

There are significant differences in the treatment of intangible assets across countries that may seriously limit the comparability of financial statements in an international context[7]. According to APB Opinion No. 17 (1970), the valuation of intangibles requires: externally acquired identifiable intangible assets to be capitalized, externally acquired unidentifiable assets to be expensed, internally developed identifiable intangibles to be capitalized, with the exception of research and development, and internally developed unidentifiable assets to be expensed. Thus, when intangibles are acquired by purchase, they are recognized and reported in the balance sheet. However, if a firm successfully allocates resources to R&D, advertising and personnel training, its balance sheet will not show the "internally generated goodwill". Obviously, this is not logical and undermines the comparability of financial statements across companies.

Except for R&D outlays (other than software development costs) and advertising (which according to FASB No. 2 need to be expensed in the period in which they take place), current US GAAP prescribe acquired intangible assets to be included in the balance sheet at their acquisition cost and amortized over a maximum of 40 years.

In 1974, the FASB decided to require the full expensing of R&D outlays in financial reports of public corporations on the grounds that a direct relationship between research and development costs and specific future revenue generally had not been demonstrated, even with the benefit of hindsight (SFAS 2, p.14). The FASB argued that empirical studies had generally failed to find a significant correlation between research and development expenditures and future improvements in the firms' performance.

Two decades later, in developed economies, investments in R&D play a fundamental role in most industries. Although conditions have changed dramatically since 1974, R&D outlays are still fully expensed in the US except for some software development costs. In view of the growth of the computer software industry in the late 1970s and early 1980s, the FASB (1985b) issued the SFAS 86, requiring that all costs incurred in establishing the technological of economic feasibility of the software must

[7] See for example Brunovs and Kirsh (1991), Choi and Lee (1992) or Emenyonu and Gray (1992).

be accounted for as R&D costs and fully expensed. Costs may only be capitalized (and subsequently amortized) once economic feasibility has been established.

The IAS 9 (IASC, 1978) requires the full expensing of research, but allows certain development costs to be carried forward as assets in order to be matched against related revenues during a period of up to 20 years. The final version of IAS 38 (IASC 1998) includes standards for the measurement and recognition of investments in R&D as they are considered as a category of internally generated intangible items. It is stated that there is no need to have two separate standards for items that should be treated similarly. IAS 22 requires goodwill to be capitalized and amortized during its useful life, which should not exceed five years, unless an appropriate justification for a longer period (up to twenty years) is provided. This view is shared by the UK (SSAP 13) and Canada. The exposure draft E61, Business Combinations (IASC, 1997b) introduces some changes in accounting for goodwill taking into consideration accounting standards for intangibles.

As for goodwill, in the UK, SSAP 22 recommends that goodwill be written off immediately against reserves, although it allows the option of capitalization and amortization during its useful life. Expensing at the acquisition date may lead to an overestimated value of ROE after an acquisition takes place, which might be seen as a competitive advantage for UK firms versus US companies (Choi and Lee, 1992).[8] However, it may also lead to the destruction of shareholder value, weakening the capital base and increasing the future cost of capital (Kennedy, 1994; Tollington, 1994; Davis, 1996). The ASB discussion paper on goodwill set out several alternative treatments: capitalization and amortization, capitalization with annual reviews, immediate write-off against reserves, and several combinations of these.

In Australia, the ASSB exposure draft 49, required that identifiable intangible assets be amortized over the period of time during which the asset may be reasonably expected to yield benefits. The draft faced strong criticism from practitioners (English, 1990), for being against the views held by the IASC.

In the European Union, the 4th Directive allows member states to authorize firms to carry forward R&D costs without providing a precise definition thereof. Goodwill

[8] Despite the theoretical consistency of that conjecture, Megna and Mueller (1991) calculated individual advertising capital stocks for firms in the toys, distilled beverages, cosmetics, and pharmaceuticals firms, and R&D stocks for the pharmaceuticals firms, and found differences in profit rates are not controlled for after these adjustments were introduced.

resulting from an acquisition may also be capitalized and amortized during a period of up to five years. However, the European Commission allows member states to set a higher limit, provided it does not exceed the assets useful life. Obviously, this results in a variety of accounting methods being applied and limits comparability (FEE, 1992).

The view that intangibles should be recognized as assets whenever their existence can be justified, seems to be receiving stronger support in recent years within the professional and the academic community. Colley and Volkan (1988) suggest that all tangible and intangible assets that form the basis for the excess payment in an acquisition should be identified, capitalized and amortized; any remaining unidentifiable portion of the excess should be written off against equity on the acquisition date. Arnold (1992), argues that there are three components in goodwill: fair value of separately identifiable intangible assets, the present value of benefits arising from jointness of activities and market imperfections, and over- or underpayment. In his view, intangibles falling in the first two categories should be treated as assets (capitalized) provided their existence and amount can be reasonably justified.

The IASC's exposure draft E50, Intangible Assets, proposed that intangibles were recognized on the balance sheet and amortized over a maximum of 20 years if they matched three requirements: first, it must be non-monetary, without physical substance, and identifiable; second, it must yield future economic profits for the firm; and third, its cost must be susceptible of reliable measurement. IASC's E50 was strongly criticized on the grounds that very few assets would be able to qualify for recognition with such restrictive requirements (Cairns, 1995). Grant (1996a) argues that the approach taken in the draft is fundamentally flawed, as the key factor in accounting for intangibles should be whether they are truly separable/saleable, and are in effect an investment. If they are not, an assessment is needed as to whether the asset is a deferred cost that is consumable by the enterprise.

The final version of the standard (IASC 1998) follows the line indicated above, arguing that the concept of deferred cost does not exist under the IASC's literature. The perception of such concept and what their accounting treatment should be differs world-wide. Only the items that meet the definition of an asset and its accounting recognition criteria according to the IASC Framework (1996) or an International Accounting Standard, should be recognized as an asset.

In sum, although accounting standard setting bodies are now placing a great importance on the measurement and the disclosure of information on intangibles, the financial statements are still unable to present enough relevant (besides reliable) information on the value of the firm's intangibles.

2.3.1.1. Evidence on Recognition and Measurement Practices

Since there is in most countries a certain extent of discretionality in the recognition of some intangibles and the choice of the depreciation method, surveys of the practices adopted by firms in different countries are likely to provide interesting insight. Several surveys have already been carried out, and their results will be briefly commented here.

An examination of the accounting policies adopted from 1985 to 1989 by a sample of 150 Australian listed companies for goodwill and identifiable intangible assets, revealed a decrease in the diversity of methods used and a preference for the capitalization of identifiable intangibles, in order to reduce the impact on operating profit of the amortization of goodwill (Wines and Ferguson, 1993).

Emenyonu and Gray (1992) collected data from the annual reports of 26 large industrial companies from France, Germany and the UK, and investigated the existence of differences in accounting measurement practices. Their results indicate that significant differences exist in the treatment of goodwill and R&D costs. While German and UK companies seem to prefer to write off goodwill against reserves, 92% of the French firms capitalize and amortize it. As for R&D, most firms in all the three countries showed a preference for immediate write off .

The Report on the Valuation of Intangible Assets (Arthur Andersen & Co, 1992), presents an analysis of several methods for the valuation of intangibles. It discards historical cost valuation on the grounds that it is not into line with the appropriate definition of value (the discounted future cash flow expected from the asset). Then, three possible valuation approaches are identified: discounted cash flow, earnings multiple and the S curve. The report claims that there is considerable consensus about how intangibles should be valued (using the DCF method or estimating a multiple of earnings or cash flows as a surrogate). However, as Napier and Power (1992) point out,

no empirical evidence is provided in support of that claim, and the companies listed as having been surveyed are just the reports' sponsors.

The so-called LBS Report (Barwise, *et al.*, 1989), investigated the valuation methods for brands in the UK and concluded that there was no general agreement on valuation methods at that time. Moreover, the report stated that existing methods could not be regarded at either totally theoretically valid or empirically verifiable. One of the main underlying problems was considered to be the heavy reliance of most valuation methods on estimates of future profitability, which yielded subjective measures of value. As a consequence, Barwise, *et al.* (1989, p.7) stated that "it is inherent in the nature of brand valuations that they are likely to fail the accountants test of *reasonable certainty*".

The evidence discussed in this section may be of help for policy makers in their standard setting process, as it represents a sample of the current practices followed by the firms which will be most directly involved in the application of the standards issued.

2.3.2. Depreciation

As discussed above, most accounting systems allow the capitalization of goodwill and certain identifiable separable intangibles, and amortization over their economic life, but a time limit is generally set for the matching of expenses with the corresponding future revenues. In most countries, accounting standards prescribe a 5-year time span for the amortization of goodwill and capitalized (Research and) Development costs and other intangibles.

The key issue in the debate on intangibles depreciation is whether or not their impact on future earnings is long-lived. Whenever there is a reasonable basis to believe that an identifiable intangible investment will give rise to a stream of future revenues, it should qualify as an intangible asset.

Since it is common practice that firms are allowed to amortize some intangibles during longer periods when there is a consistent justification, it is necessary to have a reasonable estimate of intangibles' useful life and legal life. As some intangibles have an economic life that is shorter than their legal life, an imbalance will appear if annual amortization is estimated on the basis of the asset's legal life, as annual depreciation will be artificially low and assets values and earnings will be positively biased. On the other hand, it may not always be possible to develop an accurate estimate of the useful

life of the asset. This has led most standard setting bodies to establish a maximum period for the amortization of intangibles, which ranges from 15 to 40 years.

In June 1996, the Australian Accounting Standards Board revised the standard applying to goodwill, AASB 1013, setting a maximum depreciation period of 20 years.

In January 1997, the US Internal Revenue Service issued proposed regulations on the amortization of intangible assets and related provisions of Sections 197 and 167 (f), making goodwill and other intangible assets amortizable over a 15-year period. Among the intangible assets which were affected by this regulation are: (i) franchises, trademarks or trade names; (ii) goodwill, going concern value and covenants not to compete resulting from an acquisition; (iii) workforce in place; (iv) information base; (v) know-how; (vii) customer based intangibles; (viii) supplier-based intangibles; and (ix) licenses, permits or other rights granted by a governmental body (Battersby, 1996). The related-party and anti-churning rules, gave rise to a great concern on the part of practicing accountants (Cuff, 1997; Dell, 1997).

Since its exposure draft DE 47, Accounting for Goodwill, was rejected by 93% of the corporate respondents, the ASB issued FRED 12, Goodwill and Intangible Assets, which received great support. The key to the success of FRED 12 was due to two main reasons: first, it allows firms to either amortize capitalized goodwill in a systematic way or to apply annual impairment tests whenever its useful life were beyond 20 years (Phipps, 1996). Secondly, it addressed the issue of the asymmetric treatment of purchased and internally generated intangibles, bringing UK practices into line with internationally accepted standards (Chitty, 1996).

2.3.3. Impairment

Closely related to the depreciation methods for intangible assets, is the notion of impairment. According to SFAS 121, an asset is considered impaired when its carrying value exceeds the net present value of the future cash flows it is expected to generate. Impairment may result from a decrease in the market value of the asset below its book value, changes in the regulation and the environment, changes in the use of asset, etc. Under SFAS 121, firms need to investigate, identify and restate assets that are potentially impaired (Lowe, 1996) and make estimates of future cash flows in order to assess the value of assets (Cocco and Moores, 1995), whenever the book value of the

asset may not be reasonably expected to be recoverable. Therefore, there appears to be room for subjectivity when adjusting the value of an asset for impairment.

2.3.4. Tax Related Issues

A number of relevant tax-related considerations are at the core of the debate on what intangibles are and how they should be recognized, measured and amortized. In some cases, the controversy on whether or not the capitalization and subsequent amortization of some intangibles should lead to deductions in taxable income has originated strong confrontations between firms in certain industries and the tax authorities.

Published empirical studies have failed to provide clear evidence on whether compulsory expensing of intangibles has an effect on the level of expenditure. Whereas Horowitz and Kolodny (1980) reported a decrease in expenditures, Dukes, Dycman and Elliot (1980) found contradictory evidence. Apparently, this is due to the existence of significant differences in size across firms (Elliot *et al*., 1984).

In the case of the Newark Morning Ledger vs. US, the US Supreme Court ruled that acquired customer-based intangibles can be capitalized, amortized and deducted from taxable income (over a maximum of 15 years), provided their value can be determined and they have a finite useful life.

In a similar case, the 10th Circuit Court of Appeals allowed Telecommunications Inc. to capitalize and amortize over 15 years the cost of permits obtained from local governments to operate cable systems (Willens, 1994).

During the 80's bank mergers and acquisitions in the U.S. gave rise to the recognition of an intangible asset "core deposits", which was recognized separately from "goodwill" (Harrison and Hollingworth, 1991). This new intangible asset was not recognized in principle for tax purposes. After several sentences the US Internal Revenue System has recently issued the Omnibus Budget Reconciliation Act, in order to put an end to the uncertainties and the disputes held with a number of taxpayers (Dilley and Young, 1994). Under Internal Revenue Code Section 197, enacted as part of that Act, any intangible asset which has a readily determinable and limited useful life, may be included in the depreciation deduction. This was seen by many professional

accountants as a significant step forward (Kozub, 1994; Blumenfrucht, 1994; Graham, 1993).

3. THE RELEVANCE OF INTANGIBLES FOR FIRM VALUATION

3.1. The Relevance of Intangible Assets for Equity Valuation

If intangibles are not reflected in the balance sheet and intangible investments are fully expensed as they are undertaken, both earnings and book value of equity will be understated by the accounting model. Thus, investors will be provided with biased (conservative) estimates of the firm's current value and of its capability for the creation of wealth in the future. Consequently, as Lev and Zarowin (1998) states, there is a need to provide in the financial statements more comprehensive, more reliable and more timely information on intangibles. This could be done by broadening the current accounting model and encouraging voluntary disclosure by management, explaining the impact that intangibles are likely to have in the future profitability of the firm.

The empirical evidence provided by Lev and Zarowin (1998), Chang (1998), Zarowin (1998), Collins, Maydew and Weiss (1997), and Francis and Schipper (1996) reveals a significant decrease in the usefulness of corporate financial reports to investors: Lev and Zarowin (1998) found that whereas during the 1950s, 18 to 22 percent of the differences in stock performance across firms were related to differences in their reported earnings, only 7 percent of the variance of stock returns was explained by earnings in the 1980s. Collins, Maydew and Weiss (1997) found that whereas the relationship between earnings and prices declined between the 50's and the 90's, the explanatory power of book values experienced a significant increase. Francis and Schipper (1996) also documented a decreasing pattern between the 1950s (24,2%) and the period 1980-93 (15,1%). Lev and Zarowin (1998) argue that change, initiated from within and outside the corporation, and the consequent increased uncertainty are the major reasons for the decreasing informativeness of financial reports. Among the sources of bias in financial statements, Lev and Zarowin mention the immediate expense of R&D and restructuring costs, which depresses reported earnings and book values despite the fact that future cash flows and firm values are generally enhanced by such activities.

There is obviously a significant risk associated to underinvesting in intangibles. Investments in intangibles are mainly intended to maintain and gain market share, and may be understood as a consequence of competitive pressures. Thus, it seems clear that such investments are likely to strengthen the firm's competitive position. The evidence provided by Abrahams and Sidhu (1997), Barth and Clinch (1997) Aboody (1998), Hall (1998) and Lev (1998), indicates that there is a consistent association between the amounts of R&D investments and their market value. Therefore, failure to identify those intangibles which are of particular relevance for the firm's operations and failure to allocate sufficient resources to them, will lead to a loss of potential competitive advantages, failure to improve the firm's competitive position, and a poorer future performance. Consequently, for both investors and managers it is necessary to identify intangibles and develop ways to successfully manage them within the organization.

There is also a great risk associated to the underassessment of intangibles in the analysis of the financial position of a firm. If financial statements provide investors with biased (conservative) estimates of the firm's value (the book value of equity) and its capability to create wealth in the future (current earnings), inefficiencies (myopia) may appear in the resource allocation process which takes place in the capital markets. For on the basis of publicly available financial statements investors might decide to allocate resources to firms investing little or nothing in intangibles and thus reporting higher levels of earnings and book values in the short-term (which are likely to revert in the future), instead of supplying capital to companies undertaking large investments in intangibles which may make them appear as less attractive in the short run, but ensure higher future earnings. The decreasing explanatory power of earnings for stock returns documented by Lev and Zarowin (1998) and Francis and Schipper (1996) may in fact have much to do with this.

Failure to correctly reflect the impact of intangibles on the current and future performance of the business implies that accounting statements fail to present an unbiased (true and fair) view of the firm's financial position. Therefore, investors are provided with non-relevant and non-comparable financial statements and will most likely not be able to assess the value of companies to make efficient resource allocation decisions.

Managers will face a similar situation if they do not identify value relevant intangible investments that are most relevant for the purposes of the organization.

Failure to allocate sufficient resources to the relevant intangibles may result in a loss of competitive power and a deterioration of the firm's financial position in the long run. Therefore, managers need to be provided with an appropriate definition of intangibles and a comprehensive classification thereof.

There is an extensive body of literature providing empirical evidence on the relevance of intangibles for equity valuation and, therefore, pointing out the need to take intangibles into account in investment, credit and management decision making. A review of the most relevant contributions to the literature in this area reveals that in general, current investments in intangibles are associated with higher future earnings and stock returns. However, it also reveals the existence of a significant bias in accounting research, towards the analysis of the value relevance of investments in R&D and advertising to the detriment of other intangible assets.

3.2. Research and Development, and Advertising

R&D is among the most frequently used indicators of innovation. However, its shortcomings are well known: (a) it does not measure outputs but inputs, and therefore cannot detect variations in the efficiency with which R&D activities are carried out; (b) R&D activities are underestimated in production-based technologies, where much technical change takes place in design offices and production engineering departments as well as in R&D laboratories; (c) the same happens in SME's where technology producing activities often do not have a separate functional and accounting identity; and (d) service industries and software in particular are also badly captured in R&D statistics (Soete and Verspagen, 1990). Moreover, R&D is a process in which several stages may be distinguished and investors may attach different value to the firm, depending on the degree of advancement of the innovative process (Pinches, Narayanan and Kelm 1996).

Another widely used indicator, patents, also has many shortcomings: (a) Propensity to patent differs widely among firms; (b) Propensity to patent also varies from one field of technology to another, due to differences in the effectiveness of patent protection and intrinsic features of technologies; (c) Propensity to patent may vary from one country to another since size and geographical position give rise to different expectations of the returns from patent protection; and finally (d) differences among national patent systems, arising from legal, geographical, economic and cultural factors

are a further source of bias (OECD, 1994). Notwithstanding, these two measures have been used by a large number of researchers to investigate the effect of technological activity on a firm's performance.

Mortensen, Eustace and Lannoo (1997) argue that economic and business researchers have failed to document a statistically significant relationship between R&D and corporate performance. In their view, this may be due to the fact that the approach has largely been based on a linear view of the relationship between R&D and market value, while the impact of R&D on corporate performance is likely to depend on environmental factors, such as the concentration of R&D activities in certain communities or the dynamics of R&D diffusion.

An analysis of investors' behavior carried out by Dukes (1976) revealed that it is common to adjust earnings for the full expensing of R&D. Therefore, the market appeared to control for the distortion that the expensing of R&D introduced in the financial statements and considered the R&D outlays as a fixed intangible asset with a long economic life.

In a similar vein, Ben-Zion (1978, 1984) found that the difference between market value and book value is correlated with R&D expenditures. Thus, his results provide evidence that investors attach a high value to investments aimed at improving the competitive position of companies and pay little attention to the conservative earnings figure resulting from the full expensing of R&D.

Consistent with these results, Grabowski and Mueller (1978) found that firms in research-intensive industries earn significantly above-average returns on their R&D capital, and Woolridge (1988) documented a positive investors reaction to firms' R&D investments announcements which implies that the market is not myopic, but expects current R&D expenses to contribute to increase the future stream of earnings. Hirschey (1982) also found that, on average, advertising and R&D expenditures have positive and significant market value (intangible capital) effects. The validity of these findings was corroborated by Jose, Nichols and Stevens (1986), Lutsgarten and Thomadakis (1987), Morck, Shleifer and Vishny (1988), Chan, Martin and Kensinger (1990), Connolly and Hirschey (1990), Morck and Yeung (1991) and Doukas and Switzer (1992). In all these studies, a consistent positive share-price response to announcements of increased R&D spending was documented, even in the presence of earnings declines. They also found that higher R&D intensity than the industry average leads to larger stock returns for

firms in high-technology industries. However, Connolly, Hirsch and Hirschey (1986), documented that certain factors may affect the relationship between R&D investments and future firm performance. They analyzed a sample of 367 firms drawn from the 1977 *Fortune* 500, and found that unionization reduces the returns to R&D and produces a corresponding limiting influence on R&D investment at the firm level.

A number of studies have subsequently investigated the relationship between Tobin's *q* ratio and investments in intangibles: Sallinger (1984), analyzed the relationship between monopoly profits associated with higher concentration and the existence of strong unions, and concluded that the former is accurately explained by the latter. However, the evidence presented in Clark (1984) casts some doubt on the consistence of that conclusion. Griliches (1981), Cockburn and Griliches (1988) and Hall (1988) have all found significant correlations between *q* and investments in R&D and patents. On the other hand, Hirschey and Weygandt (1985) documented a consistent relationship between *q* and the ratio of R&D investments to sales. Finally, Megna and Klock (1993) analyzed to what extent intangible capital explains differences in the *q* ratio across firms in the semiconductor industry, and found significant firm-specific differences persisting after adjusting for R&D stocks and patent stocks. However they concluded R&D and patent stocks appear to measure different elements of intangible capital.

More recently, Sougiannis (1994) found that earnings adjusted for the expensing of R&D reflect realized benefits from R&D: specifically, he documented that increases in R&D lead to an increase in profit over a seven-year period. Continuing along this line of research, Lev and Sougiannis (1996) document a significant intertemporal association between firms' R&D capital and subsequent stock returns, suggesting a systematic mispricing of the shares of R&D-intensive companies, or a compensation for an extra-market risk factor associated with R&D.

Several recent studies have provided further insight into this isssue. An example is Boone and Raman (1997) in which they provide evidence that investments in R&D are consistently related with the magnitude of the bid-ask spread and the stock price sensitivity.

Interestingly, the results reported by Amir and Lev and Zarowin (1998) and García-Ayuso, Monterrey and Pineda (1997), indicate that accounting information lacks value relevance in fast-changing, technology based industries. Amir and Lev (1996) also

documented that variables such as indexes of market penetration or the potential number of customers are fundamental determinants of the value of firms in one of such industries.

Advertising is intended to strengthen a firm's intangible capital, such as brand equity or customer loyalty. As White and Miles (1996) state, one objective of advertising is to increase the stock of an organization's intangible assets. Therefore, the cost of advertising is likely to be related with future stock performance if it is effective and has long-lived effects.

The value relevance of advertising investments was first investigated by Comanor and Wilson (1967), who provided early evidence on the usefulness of advertising intensity as a proxy for product differentiation entry barriers, finding a consistent relationship between industry and firm-specific profit rates and advertising intensity.

Several empirical studies have analyzed whether the effects of advertising are long-lived. These industry-specific studies have provided contradictory evidence. While Abdel-khalik (1975) found long-lived effects in the food and drug and cosmetics industries and not in the tobacco and soap and cleansers industries, Bubblitz and Ettredge (1989) and Ravenscraft and Scherer (1982) found that the effect of advertising is usually limited to the short term.

Chauvin and Hirschey (1993) found that not only R&D expenditures but also advertising investments have large, positive and consistent influences on the value of companies. Interestingly, their analysis revealed that stock returns associated with expenditures are greater for large firms than for small ones.

From a strictly analytical standpoint, Brief (1997) provides an explanation for accounting choices related to R&D expenditures, concluding that a manager would never switch from capitalizing to expensing R&D outlays in order to increase the accounting internal rate of return in the short-run. Expensing at a point in time leads to an increase in the accounting internal rate of return in future periods.

3.3. Brands, Patents and Covenants not to Compete

There is a growing trend to quantify the value of brand names and report it in companies' financial reports. During the late 1980's a considerable debate took place on

brand valuation,[9] mainly as a result of managers contention that brands constitute assets that qualify for recognition. In fact, most managers consider brands as one of the most relevant determinants of a firm's value (Smiddy, 1983).

Although there seems to be no widely accepted method for the valuation of brands[10], there are three main approaches that may compete for acceptance: historical cost, market value, premium price, net present value and brand strength valuation (Guilding and Pike, 1990).

The results of a recent empirical study carried out by Kim and Chung (1997) on the basis of a sample of US and Japanese automobile companies, indicate that country-specific intangible assets exist (mainly brand popularity), that are significantly related to market share.

Covenants not to compete have become a more frequently seen asset in current business practice. Their recognition is particularly appealing for acquiring firms, as they are allowed to amortize them annually, deducting the allowance from the income tax. Amortization is limited to a period equal to the covenant's legal life (which ranges from 3 to 10 years). Although there is no single accepted method to estimate the value of covenants, they may be assigned a value of 0.25 to 38% of the purchase price (Russell, 1990).

3.4. The Value of Intellectual Capital: Accounting for the Worth of Employees

Three decades ago, the issue of *accounting for human assets* appeared in the research agenda with the seminal work of Hermanson (1964). In the later 1960's and early 1970's it became the focus of an intense debate which was primarily motivated by the question of whether or not financial statements should include information on the cost/value of human resources. Soon after, by the end of the 1970's, the interest in *human resource accounting* (Brummet, Flamholtz and Pyle, 1968) diminished significantly as a consequence of the lack of practical implications of the research published thus far. The early 1990's have witnessed some attempts on the part of the academic community to revive the interest in human resource accounting, on the

[9] See for example Barwise *et al.* (1989), Mullen and Mainz (1989), Penrose and Moorhouse (1989), Srikanthan, Ward and Neal (1989) and Allen (1990).

[10] A systematic approach to the valuation methods for brands can be found in Smith and Parr (1989) and Arthur Andersen (1992; 79-80)

grounds that the worth of employees is a key determinant of companies' success in knowledge-based environments (Postrel, 1996). It is argued that in knowledge-based service firms, failing to recognize intellectual capital in the financial statements implies one of the fundamental assets is missing (Parkes, 1997).

Hermanson's work was primarily concerned for the informational aspect of human resource accounting. In his view, human assets should be considered as operational and not owned assets, and thus should be included in the financial statements in order to enhance the value of accounting information. Obviously, once the need to include information on human assets in the financial statements is accepted, the valuation of human resources appears as the fundamental question to address: Hermanson considered two plausible approaches: the net present value and the unpurchased goodwill methods. Alternatively, Hekimian and Jones (1967) proposed an opportunity cost approach based on the idea that employees are productive resources which companies bid for in the market: therefore, the value of a firm's human resources would either be the price other companies would be willing to pay to hire their employees or the cost of continuing with the firm's operations without their services.

The results obtained by Schwan (1976) and Hendriks (1976) provide evidence that people working within the firm are strongly influenced by accounting information. Lank (1997) believes the success of a knowledge-based organization depends to a large extent on the willingness of its people to share their knowledge and expertise.

As opposed to the financial reporting perspective of most studies in this area, Likert (1967) focused in the managerial aspect of human resource accounting. He argued that human resource accounting contributes to the creation of value by the firm, in providing managers at all levels with useful information on their performance which will enable them to make more efficient decisions. In a similar vein, Brummet, Flamholtz and Pyle (1968) emphasized the importance of human resource accounting for managerial purposes as an essential input for the planning and control functions.

Roslender and Dyson (1992) have recently called for a paradigm shift from the economic-accounting perspective of most previous studies, to a broader social scientific perspective, which they view as consistent with a more strategic emphasis. They also suggest that *accounting for the worth of employees* should be based on *soft accounting numbers* and not only concerned for *putting people on the balance sheet*.

Nevertheless, in spite of the claims made in this and other recent studies on human resource accounting (or *accounting for the worth of employees*, as it is currently known), seem to have had little practical implications and certainly no impact in the standard setting process.

Empirical research has provided evidence that investments in human resources are positively associated with future performance and value creation (Huselid, 1998; Hand, 1998). This, together with the results of recent studies, suggests that there is a need for further information on this issue in the firms' corporate reports: On one hand, Hansson (1997) has found empirical evidence supporting the view that investors are not able to distinguish personnel investments from expenses, leading to an underestimation of earnings and returns. On the other hand, Rosset (1998) has developed a measure of human capital that improves the estimation of firms' risk by means of financial data.

In view that the accounting model does not provide information on intellectual capital (and the cash outlays aimed at enhancing the value of employees such as training expenses) in the balance sheet, some companies have decided to voluntarily disclose data on what they consider as their fundamental asset. A well-known example is Skandia's approach to measuring intellectual capital: the Skandia Value Scheme and the Skandia Navigator (Edvinsson, 1997).

3.4.1. A Paradigmatic Case: Health Care Institutions.

Intangible assets are particularly relevant in organizations that develop service activities. Health care institutions provide a paradigmatic example of the value relevance of intellectual capital in service organizations.[11] Rabe and Reilly (1996) propose five factors as the most relevant for the analysis of the value of health care intangible assets: professional standards, purpose and objective of the health care intangible asset appraisal, alternative standards of value, highest and best use analysis and alternative premises of value. Among the most significant intangibles, they identify relationships with patients, trained workforce, trademarks and trade names.

Based on a survey of salaries and benefits paid to physicians after practice acquisition, historical profitability of the acquired practice and specific values attached

[11] A discussion on some valuation methods for health care organizations may be found in Mellen (1992), Collins and Simpson (1995), Meeting and Luecke (1995), and Reilly and Rabe (1997).

to tangible and intangible assets, Cleverley (1997) has found that hospitals tend to acquire unprofitable practices, tangible assets are a significant part of the acquisition price, and the importance of valuation methodology is underestimated.

3.5. The risks of Underestimating the Value of Intangibles

The immediate expense of intangible investments may lead to an undersetimation of the value of companies if they are not in a steady state in which annual immediate expenses are approximately equal to the amounts that would be written of if such investments were capitalized. Therefore, only when shifts in the amounts of investments in intangibles take place, earnings and book values will be significantly biased. Lev and Zarowin (1998) and Deng and Lev (1998) provide an interesting analysis of this issue.

Besides the body of empirical evidence on the relationship between R&D investments and future firm performance, a number of studies have been published in the literature, which document a significant association between firm value and intangibles-related events or corporate characteristics, such as unfunded pension liabilities (Bulow, Morck and Summers, 1985), diversification (Wernerfelt and Montgomery, 1988), new product announcements (Chaney, Devinney & Winter, 1991), product quality levels (Heller, 1994), employee development programs, (Gordon, Pound and Porter, 1994), or goodwill as a whole (Chauvin and Hirschey, 1994).

Ittner and Larcker (1996) found a strong association between customer satisfaction and share price levels. Jarrel and Easton (1996) provided evidence that firms recognized for their above average implementation of a total quality management program accrued excess share returns that were, on average, 15% over the five year period following the program launch.

Barth, Kasznik and McNichols (1998) have documented that the greater the intangible investment intensiveness, the higher the probability that firms be mispriced. Sougiannis (1999) showed that firms immediately expending investments in intangibles are systematically mispriced in the capital market. Finally, Lev (1998) has found evidence that the inadequate reporting on intangibles gives rise to information asymmetries that are exploited by managers in order to obtain abnormal gains by means of insider trading.

In sum, the evidence discussed above indicates that failing to identify and assess the value of a vast amount of intangibles and the lack of information on intangibles in the financial statements, is likely to lead to the mispricing of companies.

3.5.1. Investment Decisions, Mergers & Acquisitions and LBO's

The lack of information on intangibles in the balance sheet may lead to an understatement of the value of firms likely to be targets of Mergers & Acquisitions or LBO's and an overestimation of their profitability subsequent to combination. Of particular interest are the intellectual property used and the intellectual property rights owned by the target firm and by its main competitors (Bloom, 1994). Gadd and Jacobsen (1987) argue that a careful premerger study is needed in order to identify (among others) intangible assets that are hidden in the balance sheet. Among the most relevant hidden intangibles, Viner and Cohen (1990) mention: supplies, equipment, and services that are expensed upon purchase, undervaluation of book assets, and prepaid items. Harvey and Lusch (1995) provide a model for an expanded view of the diligence process in mergers and acquisitions, which in their view is likely to enable the acquiring entity to assess the value of both, tangible and intangible assets of the target firm.

The results of a study conducted by Morck and Yeung (1992) in order to investigate the relevance of R&D and advertising on direct international investment, indicate that high R&D spending is correlated with high abnormal returns, particularly among smaller acquirers, whereas advertising spending is correlated with positive abnormal returns among larger acquirers. Interestingly, they also found that abnormal returns are higher the greater the extent of management ownership, but decreased significantly when managers have dominant equity stakes.

Multinationality appears to be a relevant factor in the analysis of the relationship between firm value and investments in R&D and advertising. Morck and Yeung (1991) have shown that the positive effect of R&D and advertising on the market value of equity is increased with the firms level of multinationality.

There seems to be also a positive and consistent relationship between the amount of capital a firm is capable of rising in an initial public offering, and its scientific capabilities (Deeds, Decarolis and Coombs, 1997).

Intellectual capital is, in view of Flamholtz and Coff (1989), the critical asset to be analyzed in M&As. They suggest people may be valued using the same methods applied for tangible assets: historical cost, replacement cost, and net present value. The useful life of acquired human assets can be estimated on the basis of the probabilities of movement through an organization.

3.5.2. Lending Decisions

A firm's intangible assets may have a significant collateral value for its creditors. Ostad (1997) stresses the relevance of intellectual property for credit decisions and argues that lenders need to conduct an intellectual property audit, check filings and review employee and consultant agreements. Scott (1994) states that the lender's main challenge is to identify intangibles that could be of use to a third party and will keep their value over time.

Empirical work has revealed the existence of consistent relationship between a firm's intangible assets and certain aspects that are relevant for credit analysis. Cornell, Landsman and Shapiro (1989) found evidence that there is a consistent relationship between a firm's net intangible assets and the impact that bond rating downgrades have on its stock prices. Bergman and Callen (1991) documented a positive correlation between the renegotiation settlement accruing to shareholders and the ratio of intangible assets to the total value of the firm, and an inverse relationship between the latter and the debt to equity ratio. Finally, on the basis of a sample of 169 financially distressed firms in the US, Gilson, John and Lang (1990) found that those with the higher probability of successful private financial restructuring have a level of intangible assets.

4. IMPLICATIONS OF INTANGIBLES FOR MANAGEMENT AND CONTROL

It has been argued above that the knowledge of the intangibles that determine the value of the firm is not only necessary for the purposes of firm valuation, but also for efficient management decision making. The fundamental problem for the recognition of intangibles as assets (the absence of objective financial accounting criteria for their measurement) is not a critical issue from a managerial perspective. However the general

problem of adequate measurement of intangible investments and its effect on the firm performance continues to be an important matter of concern for managers.

Eric Flamholtz, has contributed significantly to the development of human resource accounting as his work has adopted both, the financial reporting and the managerial perspectives. As far as the former is concerned, Flamholtz (1985) states that human resource accounting provides users of financial statements with useful information for the evaluation of management's performance. As for the latter, he argues it provides a framework for resource allocation decision-making, provides numerical information about the cost and value of employees as organizational resources, and motivates line managers to adopt a human resource perspective in their decision-making processes.

Carter (1996) mentioned that her colleagues in sociology and history use to tease economists by calling economics "Queen of Social Sciences", this royal status being largely based on measurement, that is, the ability to quantify variables. She draws attention to the many troublesome discrepancies between the traditional economic measures and the knowledge-based economy whose performance they represent. She wonders whether the "crown" is at risk.

Knowledge is nowadays a main production factor. We are facing a "new historical era - the knowledge-based economy, the learning economy or the information society- where the economy is more strongly and more directly rooted in the production, distribution and use of knowledge than ever before" (Foray and Lundvall, 1996).

The emergence, characteristics and effects of the knowledge-based economy have been widely studied by the OECD. Several international Seminars and Symposia hosted or sponsored by this Organization have paid particular attention to this field and have triggered a significant number of studies (i.e. OECD, 1996b). In most of these conferences the issue of intangible investments is tackled and both its growing importance and the difficulties to measure them properly are highlighted. As for the former Abramovitz and David (1996) use the Kendrick estimates (Kendrick 1994) to analyze the long-term experience of the United States. According to those estimates between 1929 and 1990 the ratio of non-tangibles to the conventional tangible stock had more than doubled.

With respect to the measurement difficulties, the OECD has clearly stated that *a major reason for underinvestment in intangible assets, such as technology and human*

resources, is their lack of visibility (OECD, 1998; 294). They are encouraging research in this field and suggest there is a need to develop a set of indicators of intangibles within firms and a reporting structure which facilitates comparability. That will be of use for managers, stakeholders and policy makers.

4.1. Organization and Innovation

During the twentieth century, industrial organization economists have placed a great importance on the analysis of the effects of innovation and technological advancement on the performance of business enterprises at the individual level as well as on growth and employment at the macroeconomic level.

A large body of research has examined the relationships between the characteristics of markets and companies and industrial innovation. Studies in the "neo-Schumpeterian" literature have focused on the effects that firm size and market concentration have on innovation. Recent studies have moved from that somehow narrow view of innovation as a function of size and concentration, towards the analysis of three relevant factors which may explain inter-industry differences in innovation: demand, appropriability and technological opportunity conditions.

From a theoretical standpoint, Sonnenberg (1994) concludes that there are eight critical (intangible) success factors for competing effectively in knowledge-based, technology-intensive economies: generate passion, constantly reinvent the organization, build concentration and focus, become devoted to service excellence, adapt to change, respond with speed, be flexible, and build trust.

Innovative ability and creativity are nowadays seen as essential attributes of successful enterprises. Cox (1993) holds that to introduce creativity in the organization, firms need to welcome a creative spirit into their corporate culture, generate new ideas by introducing a creative program, encouraging team work, improving communication, use creativity for strategic planning, and seeking new perspectives

Holden and Wilhelmij (1995) consider that business process models are designed in isolation but must be applied in real organizational and business situations. As a result, they consider a key management concern is how to identify the non-process factors that allow a business process to achieve maximum performance. In their analysis, they provide evidence on the usefulness of the KNOVA (KNOwledge Value-

Added) technique to the problem of making visible the hitherto intangible people, culture, and knowledge factors that can easily influence the success or failure of a business process.

Empirical studies have revealed that market concentration has little direct influence on innovation. Instead, it appears to be the consequence of other more relevant determinants of innovation: technological opportunity and appropriability conditions. As for size, the evidence published in the literature suggests that its influence is due to industry conditions that limit growth. Recent evidence has focused on cross-industry differences in innovation. This appears currently to be a very promising area for future research.

Pavitt (1997) holds that competition between firms is not based on their diversity in technological knowledge, but on diversity and experimentation in products, processes and organizational forms, sometimes on the same fields of technological knowledge. Although there are clear cognitive limits on firm's capacities to exploit technological opportunities, they rarely fail because of an inability to master a new field of technology. Rather they fail because of an inability to match the firm's system of co-ordination and control to the nature of the available technological opportunities. Our understanding of the process of technological change is more firmly grounded than our knowledge of the associated processes of organizational change, where failure results less from technological incompetence than from established competencies that become rigidities.

There appears to be a consistent relationship between the existence of intangibles and technological innovation. Innovative technology-intensive firms are usually those in which intangibles play a more significant role. Leffebvre *et al.* (1996), have provided empirical evidence supporting the view that the existence of intangible assets is a fundamental determinant of advanced manufacturing technology adoption.

The notion of "learning organization" as an important approach towards acquiring and developing knowledge is being increasingly used in the literature. Senge (1990), whose publications set this concept at the up front, defined learning organizations as places where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together. Romme and Dillen (1997) make an interesting review of the literature in this topic, paying particular attention to the information process and its effect on the

learning process. The acquisition, distribution, interpretation and storage of information are most relevant for such learning process.

The effect of organization on innovation has also been considered from a different point of view. The issue is whether a certain amount of organizational slack facilitates or inhibits innovation. Opponents of slack claim that it relaxes incentives to innovate and encourages wasteful investment in R&D activities, while its proponents counter that slack resources allow individuals and departments to experiment with projects that might lead to important innovations. Nohria and Gulati (1997) attempt to reconcile the theoretical debate by postulating that slack is neither inherently destructive to an organization, nor is it a fail-safe cure. Too little slack inhibits innovation by discouraging any form of experimentation whose success is uncertain. Similarly, an abundance of slack inhibits innovation by fostering complacency and lax controls. These suggest that an intermediate level of slack is optimal for innovation in any organizational setting.

Several empirical studies have recently found a consistent relationship between innovation and the firm's future performance (Brynjolfsson, 1999; and Stiroh, 1999). This provides further support to the idea that financial statements should include information on the amount of resources firms invest in organizational, processes and product innovation, in order to provide the users of accounting statements with relevant information for decision making.

4.2. Strategic Management of Intangibles

4.2.1. Intangible Assets as a Source of Competitive Advantage

Investments in intangible assets are mainly intended to acquire or maintain competitive advantage. For an efficient strategic management of the firm, managers require more detailed, timely and reliable non-financial information on intangible assets. (Vitale, Mavrinac and Hauser, 1994; Lopez, 1996; Sanchez, 1996). For that purpose, it is essential to design and implement an information system which is based on the existence and relevance of intangibles (Salas, 1989).

Hall (1993) proposed a framework linking intangible resources to the firm's capabilities, which provides a sound basis for the identification of the contribution that intangibles make to the objectives of the organization and the accomplishment of competitive advantage.

Since budgeting and control are the main tasks of management, the analysis of the impact of intangibles on such tasks appears as an interesting research issue. Luft (1999) has provided evidence in this respect, showing that profit predictions are significantly understated when resources allocated to intangibles are considered as expenses instead of as investments.

4.2.2. Managing Intellectual Capital

Within the framework of the knowledge-based view of the firm (Grant, 1997) intangible assets such as intellectual capital represent a fundamental concern for efficient management decision making. Jordan and Jones (1997) consider any attempt to exploit intellectual capital in order to gain competitive advantage must be grounded on the knowledge and understanding of the firm's approach to acquiring, sharing and utilizing knowledge. Bontis (1996) proposes three guidelines for the development of intellectual capital: make knowledge management a must for evaluation purposes, formally define the role of knowledge in the firm, and draw a knowledge map of the organization. In this scenario, companies need to create value by building on their intangible assets such as brands (Dru, 1997) and knowledge stock. Moore (1996) proposes a knowledge enterprise model with a value chain comprised of four processes (leadership, customer, people and operations) that are linked by three value drivers (core competencies, customer preference, and shareholder value).

The efficient management of knowledge is becoming a major source of competitive advantage for companies. Muñoz-Seca and Riverola (1997) have developed a set of guidelines to identify, generate and diffuse knowledge within companies, and to implement effective knowledge management.

The importance of intellectual capital and the development of management capabilities to efficiently exploit it are highlighted in several papers. Quinn *et al.* (1996) mention the existence of temporary intellectual networks that are created within a company to solve a particular problem and dismantled once the task is over.

Sanchez and Heene (1997) describe a model of organizations as goal-seeking open systems composed of tangible and intangible assets which stresses the importance of managerial abilities to support organizational learning as well as to manage knowledge assets efficiently.

The impact of knowledge capital management on the firms' performance and value creation has been examined by Cockburn (1999) and Koga (1999) in the pharmaceutical and photographic camera industries, respectively. In both studies a consistent positive relationship has been found between the use of management systems that explicitly considered the cost and value of investments in knowledge capital and the firms' performance.

In the light of the discussion presented above, it seems clear that intangible resources are likely to play a significant role in business strategy. However, little attempts are present in the literature published up to the 1990's in order to determine the relevance of intangibles for the strategic management of a firm. Hall (1989, 1991, 1992) argues the case for a new perspective in business management, which takes into account intangible (intellectual) assets such as the firm's reputation, and the know-how, on the grounds that the value of conventional assets does not provide an adequate estimate of the value of the firm. Hall (1993) provided a framework linking intangible resources to functional and cultural capabilities, and used it to identify the relative contribution which different intangible resources make to competitive advantage. He classifies intangibles into two categories: assets and capabilities. Among the assets he includes trade marks, patents, copyrights, registered designs, contracts, trade secrets, reputation and networks. Among the skills or capabilities, he considers know-how and culture. Based on a survey of chief executives in the U.K. Hall (1992) concluded that CEOs consider company reputation, product reputation, and employee know-how as the most important contributors to the success of a firm.

4.2.3. Protecting Intellectual Capital

Intellectual capital is considered as a fundamental value driver: it is widely understood as associated to competitive advantage. As relevant as it is, intellectual capital appears as one of the most fragile assets in the organization, since it is subject to imitation and fraudulent appropriation. Greenlee (1996) reports industrial espionage has

increased more than 300% since 1992, up to an estimated $1.5 billion in 1995. Thus, it is not strange that Budden, Lake and Yeargain (1995) call for a careful protection of business secrets.

Therefore, managers should not only be concerned for nurturing the firm's intellectual property (Fay, 1993), but also with the protection of intellectual capital.

Interestingly, although intangibles appear to be more relevant for firm valuation than tangible assets, US firms appear to only allocate resources to the protection of the latter (Harvey and Lusch, 1997). An interesting approach towards the protection of intellectual capital consists in signing agreements with employees, by which they acknowledge the firm's copyright and patents proprietary rights (Brandt, 1997).

In sum, despite the importance of intangibles for the management of firms and their growing relevance of as a fundamental determinant of the value of companies in the world's knowledge-based, technology-intensive and fast-changing economy, little effort has been made in order to understand management current practices and little information on intangible elements except for that which is voluntarily disclosed by managers. Past research has had little impact on the standard setting process and accounting practice. Future research efforts should be directed towards identifying the decision making frameworks in which information on intangibles is essential and move on to develop criteria for their identification and measurement. This would help management in their decision-making processes within the firm and would provide standard setting bodies with a sound basis for deciding which information should be included in financial statements in order to enhance their usefulness to investors and creditors.

5. TOWARDS MORE RELEVANT (BESIDES RELIABLE) FINANCIAL STATEMENTS

As discussed above, accounting numbers as presented in traditional financial statements seem to be loosing relevance for investment, credit and management decision making. A number of proposals have been made in recent years, which represent attempts to improve the usefulness of financial statements for the strategic management of intangible assets. This section will discuss those proposals and present a view of the future prospects for the project of accounting standardization.

Accounting for intangibles has proved one of the most challenging problems of financial reporting by business enterprises. Every attempt at a solution for issues such as accounting for goodwill seems to give rise to new problems (Grant, 1996b). Two major difficulties have already been discussed: the lack of a precise definition of intangibles and the lack of criteria for their correct recognition.

The need for an improvement of the current accounting model has been suggested within both, the professional and the academic community (Davis, 1992; Wallman, 1995; Lev and Zarowin, 1998; Tollington, 1997). This seems to have lead some of the world's most influential standard setting bodies to undertake efforts intended to enhance the relevance of the accounting numbers reported in financial statements, for efficient decision making.

The American Institute of Certified Public Accountants Special Committee on Financial Reporting (AICPA, 1994) suggested corporate annual reports should include more forward-looking information and enhanced discussion of the non-financial performance factors that create longer-term value. Moreover, the AICPA's Accounting Standards Executive Committee (AICPA, 1993), issued a statement of opinion intended to lay down the basis for the disclosure of information on the costs of activities such as advertising, that are intended to create future economic benefits. According to SOP 97-3, all advertising costs must be expended in the year they are incurred, unless it is direct-response advertising that results in probable economic benefits. The statement suggests the cost of the future benefits of direct-response advertising should be recognized as assets and amortized over the estimated benefit period.

In its 1993 position paper on the future of financial reporting, the Association for Investment Management and Research stated that, in order to make sound judgments and draw rational conclusions, financial analysts need to know management's views and expectations on the future financial and strategic position of the firm (Knutson, 1993).

The US Securities and Exchange Commission seems to be also supporting the view that significant changes need to be introduced in the current accounting model. Wallman (1995) argues that the issue is not whether we should continue to tinker with the existing financial reporting system, but whether we have the knowledge, courage, and vision to evaluate and make forward looking changes in our reporting system that will make available to investors the most relevant and useful information.

5.1. Proposals for the Development of the Accounting Model

One alternative to overcome the limitations inherent to the accounting model is the use of non-financial information. The evidence reported by Eccles and Mavrinac (1995) indicates that investors seem to be currently demanding increased non-financial disclosure. A more recent survey of investors' use of information for investment decision making conducted by the Ernst & Young Center for Business Innovation (1997), has revealed that shareholders rely on a broad range of non financial factors and that they do appreciate investments in employee development, process quality and corporate innovations.

The use of non-financial measures appears to be common practice nowadays among financial analysts. Based on a content analysis of over 300 investment reports and on the frequencies with which analysts used non-financial measures, Mavrinac and Boyle (1996) concluded that: (i) analysts considered a wide variety of non-financial issues; and, (ii) those who frequently take into account non-financial issues have, on average, a higher predictive accuracy.

Malone (1997), provides an intellectual capital reporting model he believes will help companies gain better understanding of their operations.

Lev and Zarowin (1998) strongly support the view that accounting needs a new set of standards for the recognition of intangibles, which should receive a similar treatment to that of any tangible asset. However, they argue that traditional financial statements do not necessarily have to be dismissed, as they may be used as a basis upon which non-financial data as well as information intangible elements may be provided.

Although there seems to exist a broad agreement that the treatment of intangibles in current accounting systems is not appropriate, there is a great controversy over the way in which this problem may be solved (Mortersen, Eustace and Lannoo, 1997). One of the most important issues in the current debate on intangibles is how the accounting model should be modified to allow room for information on the impact of intangibles on the firm's financial position.[12] Lev and Zarowin (1998) suggest three measures to enhance the usefulness of financial reports to investors: first, to expand the disclosure of

[12] Power (1992) and Napier and Power (1992) provide a critical view on the development of the standard setting process, arguing that the debate on the accounting treatment of intangibles such as brands, is largely driven by prepares of financial statements, rather then by their users.

nonfinancial information transforming it into financial variables which could be linked to the financial reporting system; second, to extensively capitalize intangible investments with directly attributable benefits, aimed at improving the periodic matching of benefits with costs and providing unbiased measures of the book value of equity and earnings; and third, to improve the timeliness of the information as well as to provide forecasts of the future impact of intangibles in the financial position of the company. Therefore, Lev and Zarowin (1998) argue that the accounting system should be modified and intangible investments should be capitalized, reflected in the balance sheet and amortized along the economic life of the intangible assets.

Mortersen, Eustace and Lannoo (1997) indicate that a first significant step would be the disclosure of quantitative disaggregated information about expenditures on intangibles, regardless of whether or not they are expensed or capitalized. A second step would be to capitalize internally generated intangible assets following certain valuation rules which are generally accepted for tangible assets. At this point, both steps appear to be far from being feasible except in a small number of cases in which firms voluntarily decide to disclose that information.

Egginton (1990) discusses several possible approaches to the recognition of (separable and non-separable) intangibles within the framework of traditional (historical cost) accounting models, concluding that it is unlikely that the difficulties in the accounting recognition of intangibles will be resolved in the near future. However, he suggests six steps towards a principled approach to intangible asset reporting: (1) Adoption of a definition of separable intangibles as entailing legal rights to economic benefits in relation to persons at large; (2) The recognition of internally developed separable intangibles on bases consistent with the recognition of purchased separable intangibles; (3) The use of capitalization weighted for the probability of recovery, and the provisional capitalization of costs on the basis (in HC or CC accounts) for separable intangibles in circumstances where economics benefits had not yet been established with sufficient reliability for full capitalization; (4) The recording of intangibles at amounts consistent with the accounting model in use, and in particular the avoidance of selective revaluations (…) which give rise to a mixture of measurement bases in accounts; (5) The consistent recognition in HC accounts of transactions which augment assets under the HC model, and specifically, the recognition of purchased goodwill regardless of whether a combined enterprise is regarded as having arisen from merger or acquisition;

and (6) The adoption of a test of the overall magnitude of intangibles recorded in accounts, which would provide the basis for adjustments to the recoverable amount of assets.

On the other hand, investors are expected to be satisfied with a more complete disclosure on intangibles. However, shareholders with a long-term interest in the firm may prefer managers not to disclose details on relevant intangibles, as that might lead to a depreciation of the asset because of imitation, and therefore, might reduce the value of their share in the firm's capital.

It is necessary to bear in mind that, apart from managers and private stakeholders, Governments are also among the main users of the companies' financial statements for the design of economic policy in general, and specifically for the design and implementation of scientific and technological policies. A recent OECD document states that *the purpose of technology policy is to ensure that progress in knowledge translates into maximum economic and social benefits* (OECD, 1998, p.97). Intangible investments could be considered as a proxy variable for knowledge creation and diffusion within companies and its accurate measurement and disclosure is a must if technology and innovation policy is to be properly designed and implemented.

In sum, policy makers and standard setting bodies are currently faced with a remarkable challenge: since most current accounting systems have proven not to be capable of appropriately reflecting intangibles, which have recently become the fundamental determinant of most firms' value, a deep reform of accounting regulations should be undertaken, in order to provide investors with financial statements which are not only reliable but also relevant and timely (useful) for decision making. Once the relevance of intangibles has been revealed by empirical studies and the need to include information on intangible investments in the financial statements has been demonstrated, it is up to policy makers and standard setting bodies to articulate the changes in the most appropriate manner. In the design of the standard setting process, policy makers need also to be aware of the conflicting interests of managers and investors which may give rise to difficulties in the setting process.

5.1.1. The Balance Scorecard

Kaplan and Norton (1992, 1996) state that the balanced scorecard measures organizational performance across four linked perspectives: financial, customer, internal business process, and learning and growth. The BSC should present a set of cause-and-effect relationships among output measures and performance drivers. The usefulness of the BSC relies on the fact that it allows management to simultaneously control short-term financial results and monitor the progress of acquisition of the intangibles which ensure future success.

A growing number of companies (Buckman Laboratories International, Brown and Root Energy Services, the Chase Bank, Cigna Property and Casualty, Dow Chemical Co., Mobil Marketing and Refining, Skandia) are incorporating a BSC into their financial statements, in order to provide (actual and potential) investors with a more accurate view of the fundamental determinants of their equity value. Kaplan (1999) describes the experiences of some of these firms over the first few years subsequent to adoption of the BSC.

A thorough discussion on the meaning of the balance scorecard as well as a comprehensive review of the accounting literature focused on its analysis may be found in Johansson, Eklov, Holmgren and Martensson (1999).

5.2. A View of the Future Prospects

It is clear that traditional financial statements fail to provide users with relevant information on the firms' financial position. The improvement of the current accounting model may be achieved by means of complementary statements (financial and non-financial) such as the balanced scorecard. Arnold (1992) argues that identifying a single accounting method to cover both purchased and internally-generated goodwill and intangibles to meet the needs of all users is unlikely to be accomplished satisfactorily in one multiple-purpose set of financial statements.

The abandonment of the current accounting models does not seem like a plausible course of action in the near future. The costs associated to a radical change of the accounting system of reporting would be unaffordable. Therefore, it appears the most sensible approach to the enhancement of the usefulness of financial statements is to develop complementary statements within the framework of the current accounting system.

It is logical to expect pressures for the recognition of intangible assets and their inclusion in the balance sheet. Managers are expected to be willing to reflect purchased or internally generated intangible assets, as that would provide a better view of the financial position of the firm. In the case of brand accounting in the UK, managers will be particularly interested in recognizing the value of their brands, as an infinite economic life may be assumed and, thus, there is no need to amortize.

However, pressures against recognition are also likely to exist. According to Barwise *et al.* (1989), there are three reasons for that reluctance: first, the great difficulty of meeting a criterion of reasonable certainty for intangible asset; second, the fact that professional analysts do not appear to need such information; and third, the fact that firms can disclose information on their intangible investments in the notes on the annual accounts and not necessarily in the balance sheet.

Although the inclusion of information on intangibles in the annual accounts might appear as a desirable option both for managers and stakeholders, managers might consider requirements for full disclosure as a threat, since the competitive advantage of the company may depend to a great extent on the nature and value of its intangibles and these could be subject to imitation. Jensen and Meckling (1976) argued that full disclosure tends to reduce the cost of capital as it reduces the uncertainty facing investors in capital markets. However, no clear evidence has been provided in that respect. In sum, managers may have strong reasons not to disclose information on the firm's intangibles. Shareholders might also be reluctant to see increased disclosure on issues which represent their firm's competitive advantage, as that might ease imitation and lead to a reduction of the company's rate of return on equity.

Moreover, according to Hirschey and Weygandt (1985), the immediate expense of advertising and R&D for tax purposes, rather than capitalization and subsequent amortization, results in an implicit tax subsidy for advertising and R&D intensive firms. Thus, managers will prefer not to capitalize intangible investments to take advantage of the tax subsidy.

Accounting harmonization has recently become an issue of great relevance as a result of the pressure of MNEs with an international vocation on the main international accounting standard setting bodies. The agreement between the IASC and the IOSCO to undertake a joint project which aims to establish a set of international accounting

standards which will be accepted by all stock exchanges in the world, may make the IASC the leading international accounting standard setting body in the world.

However, the SEC, has established very strict conditions on IASC's standards to be accepted in U.S. stock markets. If the agreement between the IASC and the IOSCO yields the expected results, the SEC would eventually have to relax those conditions.

In November 1995, the European Union decided to adopt a new strategy aimed at gaining greater influence with the IASC so as to ensure that future IAS do not depart significantly from the European Accounting Directives.

6. SUMMARY AND CONCLUDING REMARKS

As we enter the second millenium we are witnessing one of the most critical times in the history of accounting. Since developed economies have become knowledge-based and technology-intensive, our view of the firm has significantly changed and new (intangible) elements have become the fundamental determinants of value. Thus far, Accounting has failed to provide an accurate view of such value drivers and therefore traditional (historical cost) financial statements have experienced a dramatic loss of relevance (although they have maintained their reliability). As a consequence, there is currently a significant gap between the accounting book value of the firm and the market value of its equity. Therefore, standard setting bodies are facing the (urgent) need to develop new guidelines for the recognition, valuation and reporting of intangibles. On the other hand, managers need to understand the nature and value of intangibles in order to be able to strengthen the firms' competitive position and maximize shareholders' wealth.

The first step in that direction is the achievement of a consensus on the economic nature, definition and classification of intangibles. For only on the basis of that consensus, will it be possible for policy makers to issue new standards for the recognition of intangibles in firms' financial statements. With that in mind, this paper has presented a review of the literature published in recent years, which deals with the economic nature, definition, classification, recognition, value relevance and strategic management implications of intangibles.

The review of the literature has revealed there is a certain agreement on the economic nature of intangibles as well as on their basic characteristics. In fact, most

definitions include basically the same ideas: intangibles are generally seen as sources of future economic benefits that lack physical substance and are controlled by the firm as a result of past transactions or events.

However, there seems to be a great heterogeneity in the classifications of intangibles proposed in the literature. This leads us to think that additional efforts are needed in that direction.

The value relevance of intangibles has been extensively documented in the literature. Whereas R&D has always found to be related to subsequent earnings and stock returns, the impact of advertising on future earnings has been found to be rather short. This provides support to the view that R&D expenses should be capitalized, while advertising costs should be fully expensed in the period in which they are incurred.

Intangibles have also been suggested as fundamental determinants of the competitive position of the firm, as they are seen as sources of competitive advantage. Thus, in order to be able to make efficient decisions, management needs to design information systems which provide timely, relevant and reliable information on the existence of intangibles and their impact on the firm's future performance.

Future research should be aimed at providing a consistent basis for the development of a set of guidelines for the identification, measurement, reporting and management of value relevant intangibles. Further efforts are needed in order to understand the behavior of investors with respect to intangibles information (as in Nixon, 1996). On the other hand, surveys of best practices in the management of intangibles are likely to provide interesting insight (as in Rouhesmaa 1996). These surveys could lead to the development of a classification of intangibles with potential for wide acceptance. The analysis of the value relevance of intangibles within the context of the capital market seems to be still an issue of the greatest relevance. Finally, studies in the area of managerial accounting should explore the relationship between intangibles management and industrial policy (see Salas 1996).

The evidence provided by that research would be of invaluable help to policy makers, as it is one of the basic input s in the process of development of the current accounting model by means of the issuance of new financial accounting standards.

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