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INTELLECTUAL CAPITAL: A BALANCE SHEET ASSET? (A MEASUREMENT PERSPECTIVE)

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Should financial measures of intellectual capital be placed on the balance sheet? If so how will intellectual capital be measured, and how will its inclusion on the balance sheet improve financial decision-making? We examine, from a financial measurement perspective, a growing body of intellectual capital research calling for inclusion of intellectual assets on the balance sheet, and conclude the proposals are naïve in terms of accounting measurement realities, and confused in terms of purposes served. Attempting to include dollar measures of intellectual capital on the balance sheet, from an accounting measurement perspective, is unworkable and will not accomplish what intellectual capital researchers believe it will.

INTRODUCTION

In recent decades the concept of intellectual capital has received increasing attention from academic journals as a key concept for understanding modern business success. Many now accept that economic growth, especially in technology companies, depends to a large degree on knowledge development, knowledge management, and ability to capitalize on ideas developed within a company over time. Each company's success in creating and harnessing its human knowledge under conditions of rapid change, and its related success in developing and selling products springing from internally developed knowledge is thought critical for competitive success (Roslender & Fincham , 2001; McNabb, 1998; and Stewart, 1997). Knowledge created and developed inside a company (i.e. intellectual capital) is increasingly understood to comprise a significant part of overall firm value (Sveiby, 1997). Successful stewardship of employee knowledge developed over many years (though difficult to measure in dollar terms) is widely accepted as critical to managerial success. Accordingly, since the mid-1990s there has been an explosion of academic and popular literature on the connected topics of intellectual capital, knowledge management, and knowledge organizations (Bontis, 2001).

Intellectual Capital Defined

While no single definition of intellectual capital has been accepted by all, broad agreement does exist that intellectual capital refers to value derived from internally generated knowledge developed over time. Webster and Jensen (2006) suggest four distinct classes of intellectual capital: 1) human capital arising from the skills and knowledge of the present workforce and used in their daily jobs; 2) organizational capital arising from the architecture of formal and informal systems developed over time by both present and past employees; 3) marketing capital arising from marketing relationships and marketing networks developed over time by present and past employees; and 4) production capital arising from production processes developed over time. Holmen (2005) sites other similar accepted definitions of intellectual capital:

"Intellectual capital is intellectual material - knowledge, information, intellectual property, experience - that can be put to use to create wealth" (Stewart, 1997).

"Intellectual capital is a combination of human capital - brains, skills, insights, and potential of those in an organization - and structural capital - things like the capital wrapped up in customers, processes, databases, brands, and IT systems. It is the ability to transform knowledge and intangible assets into wealth creating resources, by multiplying human capital with structural capital" (Edvinsson, 2002).

"It has become standard to say that a company's intellectual capital is the sum of its human capital talent, structural capital intellectual property, methodologies, software, documents and other knowledge artifacts, and customer capital customer relationships" (Stewart, 2001).

Nahapiet and Ghoshal (1998) suggest that social capital is a key pre-condition for the creation of new intellectual capital, and believe that large corporations, because of their dense and relatively permanent social structures, have an advantage in the creation of new intellectual capital.

Motivation

In this paper we respond to proposals coming out of mainstream intellectual capital literature calling for the inclusion of intellectual capital on the balance sheet. Some of this literature strongly suggests intellectual capital must be measured and reported on the balance sheet if financial statements are to have any continuing relevance. Additionally, intellectual capital literature is openly critical of the accounting profession for failing to measure and report intellectual assets on the balance sheet. The central motivation for this paper is to respond to what we believe to be unworkable proposals and unjust criticisms, and to argue against conclusions being advanced by mainstream intellectual capital protagonists. We strongly believe, from an accounting measurement perspective, the inclusion of dollar measures of intellectual capital on the balance sheet is unworkable and naïve. Excluding dollar measures of intellectual capital from the balance sheet has not

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been the result accounting negligence, or resistance to change, or laziness, or lack of imagination on the part of the accounting profession. Rather it is the result of sound measurement theory which understands the limits of what can and cannot be measured. In our view, intellectual capital protagonists seem unaware or unconcerned with very real practical constraints to measurement. Proposals coming out of intellectual capital literature are unrealistic and should be rejected.

Intellectual Capital Research: A Call for More Balance Sheet Disclosure

Sveiby in his 1997 book, The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets, was among the first to note that traditional balance sheets neither measure or report the value of a great many intangible factors that have as much to do with a company's value and future prospects as its traditional assets. Sveiby pointed out that the magnitude of unreported intellectual capital (which Sveiby called invisible assets) was very large, and could often grow to be five or ten times larger than reported balance sheet assets. Sveiby suggested the total amount of a firm's intellectual capital could be estimated as the difference between the market value of its aggregate traded shares and the book value of net assets as reported on the balance sheet. Because the amount was so very large in many cases, Sveiby concluded failure to report intellectual assets on the balance sheet along with a corresponding offset to equity resulted in a balance sheet with little relevance for assessing firm value.

Holmen (2005) supports Sveiby's position when posing the question, "why measure intellectual capital?" His response, inter alia, was that measuring intellectual capital can assist in evaluating mergers and acquisitions particularly to determine the prices to be paid by the acquiring firm. Measures of intellectual capital may also useful when linked to incentives plans for managers in the form of external compensation. Finally, measures of intellectual capital are needed to communicate to external stakeholders what intellectual property a firm possesses. If Sveiby and Homen are correct, omitting intellectual capital from an organization's formal financial statements not only reduces the relevance of financial statements, but violates a basic accounting principle, that of full and fair disclosure of an organization's financial position.

Other intellectual capital researchers have suggested balance sheet inadequacy due to the omission of intellectual capital as assets. Malhotra (2000) suggested balance sheets are in fact misleading measures of organizational value under current accounting methods because of the failure to include the value of intellectual capital. Ambler (2002) argued accountants must either incorporate unreported intellectual assets into financial reporting or risk financial statements which are irrelevant to shareholders for assessing firm value. Rodov and Leliaert (2002) suggested standard financial reporting provides an inadequate accounting of intellectual assets, and concludes the value of unrecorded knowledge assets must be reflected on standard financial reports if balance sheets are to have relevance in firm valuation. Seetharaman, Sooria, and Saravanan (2002) argued that the biggest challenge facing the accounting profession today is measuring and explaining the growing gap between balance sheet net assets and stock market valuations which they see as an indication of the large core value not presently reflected on the balance sheet which is the various forms of intellectual capital.

It seems clear a growing number of mainstream intellectual capital researchers see a pressing need for the development and inclusion of financial measures of intellectual assets on the balance sheet. These same researchers have been critical of the accounting profession for failing to adapt their rules to the changing nature of business

Ideas for Measuring Intellectual Capital

Because so many intellectual capital researchers have perceived a need for intellectual capital to be included on the balance sheet, and because the accounting profession has not demonstrated active interest in the idea, it is not surprising intellectual capital researchers have also begun to suggest approaches for measuring and reporting intellectual capital on the balance sheet. Several recent comprehensive literature reviews of intellectual capital research identify three separate and distinct theoretical approaches to measuring intellectual capital (Grossman, 2006; Bontis, 2001; and Petty and Guthrie, 2000). These three theoretical approaches can be summarized as:

1. Market capitalization models: these measurement models assign a total value to intellectual capital based on the difference between market capitalization of outstanding stock, and book value (or in some cases estimated fair market values) of company net assets.
2. Return on assets models: these measurement models infer a total value of intellectual capital from comparing a company's return on assets ratio to a benchmark return on assets ratio (e.g. an industry average or other market average). Under this model if a company's return on assets ratio is higher than the benchmark, a total amount of intellectual capital can be inferred using algebra. If a company's return on assets ratio is equal to or lower than the benchmark, intellectual capital is presumed to not to exist.
3. Individual elements models: this measurement model attempts to first exhaustively identify and list all knowledge assets after which dollar amounts are assigned to each 'asset' based on some valuation assumption, and without advance knowledge of the total value of all intellectual capital. Valuation assumptions employed by this model have varied. Some models assign value based on estimates of historical costs to develop them. Others models have estimated the current market values or replacement costs of each intellectual asset. Still others attempt to identify future discounted cash flows associated with each intellectual asset.

Grossman (2006) notes a major disadvantage of the first two approaches is they provide only lump-sum estimates of all intellectual capital without providing insight into the specific knowledge assets measured. He further notes that to overcome this difficulty, a few models of this type have attempted in a

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second stage allocation to arbitrarily disaggregate total intellectual capital into various sub-groupings (e.g. human capital, structural capital, customer capital). However, more often, market capitalization models have made no attempt to disaggregate total intellectual capital, and would place it on the balance sheet as an undifferentiated total.

We note here that some intellectual capital researchers (e.g. Roslender and Fincham, 2001; Garcia-Meca, Parra, Larran, and Martinez 2005) have suggested the use of **non-financial** measures of intellectual capital as well. These would be descriptive in terms other than a monetary unit. Non-financial and descriptive measures, if developed, might include such things as surveys about customer satisfaction, disclosures about the number of new patents developed, disclosure of employee satisfaction and/or employee turnover, disclosure of order backlogs, disclosure of employee training hours, and similar things. The authors do not object to non-financial supplementary disclosures such as these which could easily be added to annual reports or footnotes to the financial statements. We do not, however, consider these to be financial accounting measurements affecting balance sheet dollar amounts. Our objection is rather to the many proposals from mainstream intellectual capital literature calling for **financial measures** of intellectual capital for placement on the balance sheet, and we will discuss our reasons below.

Critiquing Proposed Financial Measures of Intellectual Capital

Next we will consider each of the three general intellectual capital measurement models proposed in intellectual capital literature from a measurement perspective. Each approach is seriously flawed.

Market Capitalization Models

The first general model for measuring intellectual capital proposed by intellectual capital literature is often referred to as the market capitalization model. Examples include Sveiby's invisible balance sheet, the Investor Assigned Market Value (IMVA), and Tobin's "Q" (Grossman, 2006; Bontis, 2001; Petty and Guthrie, 2000). Market capitalization models estimate total intellectual capital as the difference between the current market value of all outstanding stock, and the total book value of reported net assets. As noted above, market capitalization models sometimes but not always, in a second stage allocation, disaggregate total intellectual capital into several broad categories such as human capital, structural capital, and customer capital (Bhartesh and Bandyopadhyay, 2005). Protagonists of market capitalization models justify measuring and reporting intellectual capital as a means to provide investors information needed to assess firm value.

Putting aside for the moment the implicit assumption (an incorrect assumption in our view) that balance sheet assets, however complete, are an appropriate theoretical approach to estimating firm worth, it is nevertheless circular and tautological to suggest new information results from measuring and reporting intellectual capital in the way this model suggests. Subtracting total reported balance sheet net assets (already known) from total market capitalization (already known), and calling the difference intellectual capital for the purpose of providing information about firm worth is circular reasoning. Measuring intellectual capital in such a way depends upon advance knowledge of that which it is said to be useful to predict (i.e. total market value). Jenkins and Upton (2001) conclude defining intellectual capital in this way for this purpose is circular, tautological, and logically does not serve the purpose for which it has been justified.

Additionally, market capitalization models provide virtually no insight into what particular intellectual assets have been measured. The total derived under this model is a 'black box' and likely includes a large number of highly disparate knowledge assets, none of which is individually identified or better understood from the measure. The opaque total estimated from this model is also highly unstable over time and changes significantly with changes to general investor sentiment (e.g. changes in general market optimism) which appear unrelated to changes in particular knowledge assets. As stock prices go up, so does the computed amount of intellectual capital, even if no new investments have been made in knowledge assets. As stock prices go down, computed amounts of intellectual capital also decline even if significant new investments in knowledge assets have been made. The unpredictable behavior of intellectual capital over time seems more correlated to market sentiment than to investments made in knowledge assets from year to year. Intellectual capital computed using the market capitalization model has proven unstable and as unpredictable as the stock market itself. One cannot help but wonder just what has been measured. Whatever has been measured at best is poorly understood and utterly opaque, multifaceted, and includes at least significant elements apparently unrelated to knowledge assets. It is hard to imagine how intellectual capital measured under this model could be useful to financial decision making given its tautological nature and its unpredictable behavior. We conclude that while market capitalization models are easy to calculate, the result seems theoretically empty (circular) for assessing firm value, and theoretically opaque in terms of what has been measured.

Return on Assets Models

A second measurement approach sometimes proposed in intellectual capital literature for estimating total intellectual capital for the balance sheet is referred to as the return on assets model. Under this approach an individual company's return on assets ratio is compared with some benchmark return on assets ratio. Total intellectual assets are then inferred from excess return on assets presumed to exist **because unreported intellectual assets are missing from the company's ratio denominator** (i.e. total assets). Examples include Stewart's Economic Value Added model (EVA), the Human Resource Costing model (HRCA), and the Knowledge Capital Earnings model (Grossman, 2006; Petty and Guthrie, 2000).

'Return on assets' is in fact a widely used, readily understood, and readily available ratio developed from existing financial information. It is defined as earnings divided by total assets and reported as a decimal or percentage. The 'return on assets' model for estimating total intellectual capital compares

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a particular company's ratio with either an industry average or other benchmark ratio such as index or market average. When a company has a higher than benchmark return on assets, it is presumed to have existing but unrecorded intellectual assets, which because they are not included in the denominator total assets, result in the company's return on assets appearing higher than normal. With simple algebra, the precise amount of unreported intellectual assets can be estimated. The amount of intellectual capital inferred in this way is most often reported as a single lump-sum similar to market capitalization models. In a few cases it has been disaggregated into several broad intellectual asset categories also similar to the market capitalization models discussed above.

Return on assets models are criticized on many grounds. First, there has been no theory developed justifying selection of any particular benchmark ratio over any another. Second, regardless of the benchmark selected, the benchmark companies themselves (which form the benchmark average) also presumably have unreported intellectual assets missing from their denominators, a complication conveniently ignored by the model. Third, these models are empirically known to be highly unstable over time as net income varies (Grossman, 2006). As net income changes year to year, amounts of measured intellectual capital change significantly (or disappear altogether) in ways inconsistent with new intellectual capital investments.

Similar to market capitalization models, return on asset models also result in a black box result that fails to provide insights into the particular components of intellectual capital that are thought to have been measured (Rodov and Leliaert, 2002). Measured amounts of intellectual capital under return on assets models not surprisingly bear little resemblance to amounts measured under the market capitalization models suggesting whatever has been measured by the two models is not the same thing (Grossman, 2006). A final troubling aspect of return on assets models is that companies with ratios below the selected benchmark are presumed to have no intellectual capital whatsoever, an implausible outcome in the case of high technology companies with good profits and highly trained employees.

These factors (e.g. lack of supporting theory for selecting a benchmark, relative instability over time as net income varies, inability to explain why companies have no intellectual capital, and a black box result) have caused many intellectual capital researchers to conclude the return on assets model holds the least promise of the three models as a valid way to measure of intellectual capital (Rodhov and Leliaert, 2002).

Individual Elements Models

The third approach suggested in intellectual capital literature for developing dollar measures of intellectual capital for balance sheet reporting is referred to as the individual elements model. Under this approach in a first step, individual components of intellectual capital are identified and listed exhaustively. Then, in a second stage, dollar amounts are assigned to components based on any one of several approaches. Individual elements models include the Technology Broker, the Value Explorer, Intellectual Asset Valuation, and the Financial Method of Intangible Assets Measuring (FiMIAM) (Grossman, 2006; Rodov and Leliert, 2002; Petty and Guthrie, 2001).

While individual elements models have some theoretical appeal for their elaboration of the specific elements of intellectual capital measured, they also appear to be the most impractical and subjective of the three models. Rutledge (1997) despairs at the very large number of elements most intellectual capital researchers seem to believe exist. For example Rutledge points out Edvinsson's Skandia Navigator lists 164 different elements of intellectual capital (not including subcategories) that each would require separate financial valuation.

It is interesting to note commercially developed intellectual capital measurement instruments have become widely available in recent decades that purportedly identify and measure each individual component of intellectual capital. These instruments are without fail complex and include dozens to hundreds of factors, but lack agreement or convergence in thinking about what the factors are. This alone indicates the degree of subjectivity used in identifying components of intellectual capital, much less the more difficult task of valuing each (Grossman, 2006). Intellectual capital researchers to date have not even agreed whether it is better to develop a single generic list of intellectual assets for all companies, or whether each company and industry should develop its own unique list (Hunter, Webster, and Wyatt, 2005). Bontis (2001) notes many commercially developed assessment instruments list hundreds of factors to measured and then amazingly value all factors at the same amount, a highly unlikely scenario regardless of measurement assumptions. He believes such 'devoid-of-theory' instruments are exercises in complexity without any demonstrable validity or connection to reality.

Additionally, individual elements models lack agreement on the valuation approach for assigning dollars to factors once they have been identified. Some researchers have argued that dollars should be assigned based on estimated historical costs of inputs used up to develop each component over time. Others believe dollars should be assigned to items of intellectual capital based on their current market values, or replacement costs, or current trading prices (even though none of these measures exist since intellectual capital is never bought or sold). Still others believe dollars should be assigned to components of intellectual capital based on the discounted cash flows expected from each element, but with no guidance as to how this might be reasonably accomplished. It is hard to imagine how many of the valuation approaches could be accomplished. What proponents of all of three valuation approaches (historical cost, market value, or discounted cash flow) fail to address, or perhaps just do not fully understand, is not only are the components of intellectual capital a matter of almost total subjective judgment, their values are not determinable in any objective way. Any outcome could be as easily justified as any other resulting in an unacceptable potential for manipulation that financial accounting has resolutely rejected in its measurement principles. Unverifiable information is distrusted and has proven of little use to financial decision-makers over time.

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Let us think a bit more about implementation issues surrounding each suggested valuation approach. Determining historical input costs of knowledge assets that have been developed in many cases over several decades is simply not possible. Costs to create intellectual assets are not only hard to identify, they are in many cases connected to multiple objectives with multiple outcomes, may be partially or fully expired, and have in many cases been long ago been expensed as incurred. Attempts to retroactively identify and estimate (unexpired) historical costs of specific knowledge assets, years later, would be incredibly arbitrary and difficult.

Using current market values is probably even more problematic. Since most knowledge assets have never been bought or sold, there is no market to consult for obtaining these valuations. Additionally, since we do not understand (nor likely ever will) the inputs needed to create the components of intellectual capital, using summed replacement costs for creating each component is a fool's game.

Finally the idea of identifying and associating incremental discounted future cash flows to particular items of intellectual capital is so naïve, and so beyond what is possible in accounting measurement as to be unworthy of real consideration. The process of identifying incremental cash flows with particular assets is rarely possible for even the most traditional of balance sheet assets. In summary, while the individual elements model might provide appealing detail the other two models lack, it is highly subjective, requires unworkable measurements, and is by far the most naïve in terms of understanding what can and cannot be measured in a useful way. The auditor lawsuit problems that would undoubtedly result from including such subjective items on the balance sheet would themselves be enough reason to avoid this approach. Hunter, Webster, and Wyatt (2005) point out that since intellectual capital has unclear inputs, cannot be seen, is rarely recognized as legal property, is never accepted as collateral, is never bought or sold, has uncertain value, and rarely survives separation from the organization that develops it, it probably should not be considered an asset in the traditional sense. The seemingly insurmountable measurement issues only buttress their point of view.

Thus we conclude that the three of the proposed models for financially measuring intellectual capital each have fatal flaws. Market capitalization models provide only black box (and poorly understood) total for intellectual capital and rely on prior knowledge of what is to be predicted with the result. Return on assets models are devoid of theory in terms of benchmark selection, provide highly unstable results, and do not explain why some companies (with return on assets at or below the selected benchmark) apparently have no intellectual capital or negative intellectual capital. Individual elements models, while more descriptive in terms of seeing inside the black box, require unrealistic measurements are highly subjective in measurement terms. Because the level of subjectivity required is so high, results are unverifiable, would be arbitrary, and could be easily manipulated. Wise investors would decline to place much value on information of this sort. In the next section, we critically examine the two justifications offered by intellectual capital researchers for adding financial measures of intellectual capital to the balance sheet and find them both wanting.

Justifications of Financial Measures of Intellectual Capital

One argument made in intellectual capital literature for including intellectual capital on the balance sheet is investors need a balance sheet more useful for assessing total firm value [Rodov & Leliaert (2002); Malhotra (2000); Edvinsson & Malone (1997); Stewart (1997); Sveiby (1997); and Roos, Roos, Dragonetti, & Edvinsson (1997)]. While this argument sounds plausible, we posit the inclusion of intellectual assets on the balance sheet would not in fact lead to better assessments of total firm value, even stipulating for the sake of argument only that items of intellectual capital could be identified and appropriately valued.

Finance theory says total firm value is a function of net discounted future cash flows (outputs), not unexpired inputs (Gitman, 2003). Valuation approaches that sum unexpired inputs (i.e. balance sheet assets), no matter how complete the list, are theoretically inappropriate for estimating firm value (Maines, Bartov, Fairfield, & Hirst, 2003). Two widely used valuation models in finance (e.g. the Gordon Model or the Capital Asset Pricing (CAPM) model) are both based on expected future cash flows (outputs adjusted for risk) not the sum of unexpired inputs to value a firm (Gitman, 2003).

Understanding the difference between inputs and outputs is a critical theoretical distinction with respect to valuation and can be illustrated through a simple example. Suppose a $5 lottery ticket (input cost) wins a $20,000,000 prize to be received in twenty one-million dollar installments over the next twenty years (expected outputs). The winning lottery ticket should be theoretically valued at the expected value of discounted future cash flows ($1,000,000 per year over twenty years at an appropriate discount rate). The $5 input cost, while a complete and accurate description of unexpired inputs, is nevertheless inappropriate for use in valuation. Similarly, adding up all the unexpired input costs of a business including all items of intellectual capital (assuming for the sake of argument that this were possible), would only provide a broader list of input costs, but do little to inform investors about expected future outputs which are needed for valuation. The argument that financial measures of intellectual capital on the balance sheet are critical to investors when assessing total firm value is not persuasive and is a misunderstanding of valuation theory. Balance sheet assets, with or without intellectual capital included, are not the appropriate measure of firm value.

A second argument often posed by intellectual capital researchers in support of adding financial measures of intellectual capital to the balance sheet is captured by the aphorism "what is measured is managed" (Seetharaman, Sooria, & Saravanan, 2002). Intellectual capital researchers have argued dollar measures of intellectual capital are necessary if only to ensure items of intellectual capital are being properly managed and stewarded by management (Ambler, 2002).

Once again, though plausible sounding, the argument does

not hold up. Though it may be true company managers benefit from certain qualitative understandings of intellectual capital components, dollar measures of past costs are not useful for forward looking managerial purposes. Just as knowledge of the historical cost of an old stamping machine does not inform a capital budgeting replacement decision, neither does knowledge of the historical cost (or replacement cost) of past unexpired intellectual capital expenditures inform future ones. Measures of past dollar costs are rarely relevant to forward looking decisions. Consider the example of customer satisfaction. Understanding the status of customer satisfaction (customer capital) and the particular reasons for high or low customer satisfaction is highly useful for stewarding customer capital. However, the information that is useful is descriptive and not measured in dollars terms. Measures of dollars spent on customer satisfaction in the past are sunk costs and thus irrelevant to forward looking decisions. To manage customer satisfaction, qualitative information (not in dollars) may be needed; dollar measures are of little use. Including dollar measures of past customer satisfaction expenditures to the balance sheet in no way serves the purpose suggested as the reason for so doing.

A second example illustrating the nature of information needed to manage intellectual capital concerns employee education and training (human capital). Understanding the status and suitability of employee training is an important management insight. Nevertheless, the information most useful is not measured in dollars. Past dollar amounts spent on employee training is sunk and irrelevant for deciding whether future training expenditures are now needed.

A third and final example of this principal relates to assessing the effectiveness and efficiency of a company's internally generated database (structural capital). Again this would be an important managerial prerogative. Effectiveness and efficiency, however, are not informed by past dollars spent. Inclusion of a dollar amount on the balance sheet for structural capital would be of little use. What is needed is knowledge of required tasks and options for achieving them. More generally, for managerial purposes, items of intellectual capital often do require measurement in support of decision making, but always in qualitative/descriptive (non-dollar) ways. It is thus disingenuous to suggest dollar measures of the historical costs of unexpired intellectual capital expenditures are needed to promote stewardship.

Discussion and Conclusions

This paper has examined intellectual capital literature and noted the growing number of calls for inclusion of financial measures of intellectual capital on the balance sheet by intellectual capital researchers. Upon careful examination we find the ideas put forward to be unworkable from a measurement perspective. Each of three broad approaches for measuring intellectual capital from this literature is fatally flawed. Market capitalization models provide only black box totals of intellectual capital and rely on circular reasoning (using existing market capitalizations to determine an amount of intellectual capital) for the purpose of estimating market capitalization. There is no real information is such an approach. Return on assets models rely on arbitrary benchmarks without theoretical justification, provide highly unstable results over time, and fail to explain why some companies have negative intellectual capital (an unlikely scenario). Individual elements models have some theoretical appeal in terms of disaggregating total intellectual capital into its components, but are so highly subjective and unworkable in implementation that any answer supplied is as justifiable as any other and therefore would be difficult to interpret or use for decision-making.

Lev and Zarowin (1999) published an empirical study showing a decline in the usefulness of accounting information (book values, cash flows, and earnings) for predicting future stock returns over the last several decades. They concluded the declining correlation between accounting numbers and stock returns might be (at least in part) due to the failure of accounting numbers to accurately match consumed intellectual assets against current revenues, and to accurately measure and disclose unconsumed intellectual assets on the balance sheet. Though the decline in usefulness of standard financial reports for accurately predicting future stock returns is empirically evident, it is nevertheless incorrect to conclude from this that financial measurements of intellectual capital are **achievable** in a way that would lessen this problem. Recognizing a problem does not a guarantee the solution. Aesop's 'belling the cat' fable applies here; while it might be nice if the mice could bell the cat that stalks them, it is not realistic to suggest they do it. Similarly, calling for financial measurements of intellectual capital when there is no realistic means to so do, is fairly pointless. Accounting reports (book values, earnings, cash flows) **in an ever more rapidly changing world** intuitively would be less likely to predict future stock returns than has been the case in the more stable past. Any decline in the productivity of accounting information does not make it totally irrelevant as claimed by some intellectual capital protagonists, only less predictive than in the past. Furthermore, it is difficult to imagine the decline would be reversed by measuring and reporting intellectual capital if it cannot be reasonably done.

We close our paper by reiterating that the two major justifications provided by intellectual capital researchers for adding dollar amounts of intellectual capital to the balance sheet are in fact both unconvincing. The first justification assumes dollar measures of intellectual capital will help investors better assess total firm value. Accepted finance theory, however, posits discounted future cash flows (outputs) determine value; firm value should not be directly calculated from unexpired input costs even if those costs include items of intellectual capital. Second, stewardship of items of intellectual capital is not dependent upon balance sheet dollar measures. For managerial purposes, the components of intellectual capital are best understood using non-financial qualitative measures that provide descriptive information needed to manage them in the future. From these non-dollar metrics, management can decide if existing conditions require new investment in intellectual capital. Since the three methods proposed models for measuring intellectual capital in dollar terms have fatal flaws from a measurement perspective, and since the two main justifications for including dollar measures of intellectual

capital on the balance sheet are unconvincing, including financial measures of intellectual capital on the balance sheet seems a poor idea. In the authors' opinion, there is little reason to expect the financial accounting community, trained in the theory of financial measurement, will add balance sheet financial measures of intellectual capital similar to those proposed in intellectual capital literature anytime soon; nor should they.

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