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It is my hope that the *Clarion Business and Economic Review* will continue to display the fine work of university faculty and businesses. Likewise, I anticipate that our best graduate students, faculty members, and a broader range of researchers will continue to contribute their work. Again, welcome to this edition.

Sincerely,

Rod D. Raehsler, Ph. D.
Director of the Bureau of Business and Economic Research
Editor of the *Clarion Business and Economic Review*

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THOUGHTS ON MEASURING AND REPORTING INTELLECTUAL CAPITAL ON THE BALANCE SHEET: CAN THIS CAT BE BELLED?

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Introduction:

One of Aesop's fables describes a group of mice gathered to discuss their most pressing problem, the cat who stalks them. Various solutions are proposed and rejected until at last a young mouse observes the main danger has always been the silent and unexpected manner in which the cat attacks. "If only we had some warning we could easily escape" he says. And thus he proposes a bell be tied to the cat's neck so mice will know when the cat is near and can take cover. The idea is greeted with applause and the young mouse is congratulated until finally an old mouse gets up and says, "That is all very well and good, but who among us can bell the cat?" And the idea was never spoken of again. The moral of Aesop's fable is that it is easy to propose impossible solutions.

This paper makes the argument that the increasing number of intellectual capital researchers who support developing financial measures of *intellectual capital* for inclusion on the balance sheet are guilty of proposing impossible solutions.

The Interest in and Importance of Intellectual Capital

Interest in *intellectual capital* as an idea important to modern economic development is undeniable. John Kenneth Galbraith is often credited with coining the phrase in a 1969 letter to fellow economist, Michal Kalecki, and thereby starting a new stream of thought about the true nature of company value (Bontis, 2001). Over the decades that have followed, *intellectual capital*, has gained traction among American management circles especially after management guru Peter Drucker expounded on its critical importance to modern organizational success (Grossman, 2006). Since the 1990s there has been an explosion of academic and popular literature concerned not only with intellectual capital, but with related topics of knowledge management, and knowledge organizations. *Intellectual capital* and *knowledge management* are acknowledged as twin fuels driving much modern economic growth. Heavy

manufacturing, the driver of economic growth for much of the first half of the twentieth century, has become less important in "new economies".

New economy managers therefore are shifting focus to knowledge assets and to facilitating the creation of organizational processes that identify and convert technical advances (knowledge) into marketable products. Traditional physical assets are now viewed as only a small part of what is needed, and relatively less critical to understanding business value. Rather it is a company's ability to manage knowledge, identify opportunities, and convert its knowledge into marketable products that is increasingly central to success (Roslender and Fincham 2001; McNabb 1998; Stewart 1997).

Microsoft and United States Steel Corporations provide quick illustrations of two companies representing the new and the old. Microsoft is a new economy firm profiting from an ability to rapidly identify and aggressively act on market opportunities in the software industry under conditions of rapidly changing technology. Microsoft utilizes employee knowledge and internal company structural and organization knowledge management to do this. United States Steel on the other hand, is typical of an old economy firms remaining relatively more dependent upon its fixed factory assets and factory production processes for success. In 2005, gross plant and equipment represented fully 66% of United State Steel's total gross assets but only 8% of Microsoft's. Revenue and operating income per dollar of plant assets were $1.24 and $.05 respectively at United States Steel, but were a much higher at Microsoft at $6.24 and $1.92, respectively. These levels of revenue and operating income per dollar of fixed assets are more than five and thirty-eight times higher at Microsoft than at United States Steel. Clearly many things are driving value at Microsoft other than fixed assets.

Another measure of the growing significance of intellectual capital in today's world is the longitudinal increase over time of the ratio of *total firm market value/ total book value*. Increases in this ratio over the last two decades are thought in large part to be connected with unmeasured and unreported intellectual assets boosting firm market values, though not reflected in reported accounting assets. Baruch Lev (2003) reported that the average market to book ratio for the Standard and Poor's 500 firms since 1980 has increased from just over one in the early 1980s to a peak of nearly seven and one half by the year 2000. Intellectual capital commentators including Robert Elliot, Tom Davenport, Leif Edvinsson, and Steven

Wallman have all asserted unreported intangibles are growing in size and importance at many companies (Maines, Bartov, Fairfield, and Hirst, et. al., 2003; Bontis, 2001).

Considering this growing recognition of the importance of intellectual capital, it is not surprising that many commentators have also noticed the paucity of information about *intellectual capital* presently available in standard financial statements. Sveiby (1997), in his book entitled *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets* was one early commentator on the flaws of balance sheets that fail to measure or report a great many intangible factors having more to do with a company's value and prospects than reported tangible assets. Sveiby believed the magnitude of unreported intellectual capital, which he called *invisible assets*, was often very large and even five to ten times larger than the reported tangible assets on some balance sheets. Sveiby further suggested an approximate measure of a firm's total intellectual capital was the total difference between the market value of aggregate company shares and book value of those same aggregate shares. He also suggested the idea of placing *intellectual capital* on the balance sheet under a heading of *invisible assets* with a corresponding offset to shareholders' equity to make the balance sheet more relevant.

Sveiby was not the only one to perceive a growing need for balance sheet reporting of so-called invisible assets arising through knowledge and knowledge management within a company. For example, Malhotra (2000) suggested that the measurement of institutional or organizational value using traditional accounting methods has become increasingly inadequate and irrelevant. Ambler (2002) suggested accountants must incorporate unreported intellectual assets into their financial reports or risk making these reports irrelevant and also denying shareholders an opportunity to see how these unreported assets are being stewarded. Rodov and Leliaert (2002) asserted standard financial reports provide inadequate accounts of intellectual capital and believe intangible assets must be reflected on standard financial reports to improve their relevance. Seetharaman, Sooria, and Saravanan (2002) argue the biggest challenge facing the accounting profession today is explaining the growing gap between balance sheet measures of assets and stock market valuations of company stock. They view the gap as an indicator of just how much core value of many companies is not measured or reported on the financial statements. Other researchers suggesting a need for additional intellectual capital reporting include Edvinsson and Malone (1997); Roos et. al. (1997); and Stewart (1997).

In short, there has been a call by many intellectual capital researchers for better financial reporting with respect to intellectual assets on the balance sheet. If anything, the idea of including as balance sheet assets amounts for intellectual capital has been gaining momentum in recent years, especially in European academic and business circles (Abouzeid and Drinkard, 2002).

While acknowledging the importance of intellectual capital to new economy firms, conservative (old-mouse) instincts suggest balance sheet measures of intellectual capital may be another impossible solution easily proposed. Can there ever be meaningful financial measures of intellectual capital? Can the cat be belled?

Measurement Theory

The Financial Accounting Standards Board (FASB) has been the group entrusted by the Securities Exchange Commission for the last three decades to develop accounting measurement rules that fairly describe the financial affairs of publicly traded companies. Early on, the FASB focused on financial measurement theory to help it in its mission and has described the characteristics of financial information that make it useful in financial decision making. *Statement of Financial Accounting Concept (SFAC) No. 2* elaborates those financial measurement characteristics that make information useful in decision-making in environment in which external users of financial reports are at risk from false or misleading financial information provided by management, a group, that itself, that has strong self-interests in outcomes. Human history is replete with examples of judgments being skewed by self-interest even in the best of times, and being fraudulent in the worst. *SFAC No. 2* carefully notes basic information requirements of financial reporting under these circumstances. According to *SFAC No. 2*, useful information must include at a minimum **two** primary qualities: information must be both *relevant* and *reliable*. Without some minimum level of each of these qualities, information has no value for decision-making. Unfortunately, real world situations often require trade-offs be made between these two qualities. For example, reliability is sometimes sacrificed for the sake of relevance, and relevance is sometimes sacrificed for the sake of reliability. When trade-offs are required, they reflect the considered judgments of the FASB about how to produce information with the best overall usefulness in decision-making. Members of the FASB include former government regulators, securities markets participants, accountants, academicians, and business

professionals. The FASB routinely makes judgments to balance the requirements of relevance and reliability in financial information for the overall good of the investing public.

SFAC No. 2 states that without both minimum relevance and minimum reliability, information has no value whatsoever. That is to say, both qualities must be present simultaneously to some degree for information to be of use. Indeed information completely devoid of either is more likely to be damaging than helpful in decision-making either by obscuring other useful information or by opening up the possibility of manipulation.

In elaborating the meaning of ***relevance,*** the FASB has said financial information is relevant when it informs financial decisions, now or in the future. Relevant information improves predictions about future outcomes, and/or provides feedback about past outcomes which also inform future decisions. Thus relevance is a function of informing future decisions to improve the value of results associated with them. By implication, irrelevant information does not improve decisions even when it is accurate and reliable. For example, assume a person wishes to decide whether to take his umbrella to work which is only desirable when it rains. Relevant information includes information informing the likelihood of rain. Information that dark clouds are in the sky (predictive of rain) or that the local weather forecaster predicts a 90% likelihood of rain (also predictive of rain) is relevant. Irrelevant information might include that today is Tuesday or that a young child has chicken pox. Neither piece of information is even slightly predictive of rain, though both may be entirely accurate.

In elaborating ***reliability*** as a concept, the FASB has said information is relatively more reliable when it meets three conditions. The first condition is verifiability. Reliable information can be independently verified. Verification refers to that quality of information which allows others to independently take the measure and get the same result. For example, stock trading prices of General Electric (at a particular trading moment) are verifiable. Ten people who independently check a *Wall Street Journal* or other financial source to ascertain its trading price will all get the same result.

The FASB also says information is relatively more *reliable* when there is a high probability the information can be reasonably expected to contain *representational faithfulness* (i.e. accuracy). This means measures of financial events or set of facts are expected to reasonably describe what has actually occurred. To the extent judgments and estimates are used in measuring events (as they often are in accounting), these

judgments and estimates must have a history or other sound basis for providing the expectation of reasonable accuracy. Reasonable accuracy does not mean absolute accuracy, only that estimates and judgments convey more information than noise from error. For example, a fleet of trucks is depreciated over a seven year estimated useful life, but after the fact the same fleet ends up having an actual useful life of eight years. A seven year estimate for an eight year life is probably an acceptable approximation of what has occurred (though somewhat inaccurate) given the relevance added by using this approach. On the other hand, if the situation were instead one in which virtually no information was available concerning the actual useful life of the asset (e.g. it could be two years, seven years, fifty years, or even a hundred years), measuring and reporting depreciation based on an assumed life of seven years is probably not *representationally* faithful. In this instance, the reported amounts for depreciation are likely to contain more error than accuracy because the measurer does not have any reasonable basis for expecting measures to accurately portray what is being described. The principle of reasonable accuracy or *representational faithfulness,* explains why local weather forecasters abstain from predicting weather too far into the future. Beyond a certain point (though potentially relevant if assumed accurate) forecasts provide such small expectation of accuracy or reliability, they are given no value.

Third, the FASB has said information is relatively more *reliable* when it is known to be free from systematic biases resulting when those providing the information have a strong self-interest in the outcome. This has to do with the *environment* in which information is gathered and interpreted. Environment can be one of disinterested objectivity or it can be one of strong self-involvement. The concept of potential for bias is apparent in the belief of many that tobacco industry studies on the health aspects of tobacco products are less trustworthy than independent university research or Center for Disease Control research. The university professor seeking promotion is seen as more biased in her self-evaluation of her own research, teaching, and service than is a disinterested university committee assigned to conduct the same evaluation. The idea of double blind research studies also recognizes the phenomenon of bias. The desires and expectations of researchers (and also their subjects to please) often skew measurements even if unintentionally. In short, personal self-interest in outcomes can be a powerful influence on judgments made about what has happened and how to interpret it. Since financial information is provided by management to external parties, it is not collected in a disinterested vacuum. Therefore the FASB places a

premium on measures and measurement principles that can be verified or are known to be representationally faithful to offset systematic biases that otherwise might result. To the extent information is known to be relatively free from systematic bias, it is deemed more reliable.

Overall, it is the financial measurement principle of r*eliability* that provides the biggest hurdle to measuring and reporting amounts of intellectual capital on the balance sheet. Absent sufficient levels of reliability, (i.e. absent minimal verifiability, representational faithfulness, and protection from management bias) measures of intellectual capital will have no usefulness for decision-making even if potentially relevant. Perhaps this is why proposals for measuring and reporting intellectual capital on the balance sheet, after twenty years of study, have led to little if any discernable interest or activity in the United States on the part of the FASB. Edmund L. Jenkins, Chairman of the Financial Accounting Standards Board has acknowledged the importance of intangible assets in the new economy, but at the same time he has questioned whether they are, or ever will be measurable in a useful way (Heffes 2001).

Financial Measures of Intellectual Capital--Twenty Years Of Inconsequential Progress

According to several recent literature reviews describing progress (or perhaps lack of progress) in measuring intellectual capital over the last twenty years, there have been but three general approaches (each with many variations) used for taking its measure (Grossman, 2006; Bontis, 2001),. The three approaches are:

1) Models which assign a total value to intellectual capital equal to the total difference between market capitalization of stock and the book (or replacement cost) of company (net) assets.

2) Models inferring a total amount of intellectual capital by comparing a company's specific *return on assets* with a benchmark *return on assets* (e.g. an industry average or a market average). If a company's *return on assets* is higher than the benchmark, an amount for intellectual capital is inferred using algebra.

Both these approaches provide only lump-sum single valuations for intellectual capital with no disaggregation or insight into its specific components. In some variations, the total amount is broken down into three or four (or more) broad categories (e.g. employee knowledge related, organizational knowledge related, uncapitalized research related) using some subjective basis for doing this.

3) Models attempting to identify subjectively the individual components of intellectual capital, and then subjectively assign dollar values to each.

Each of three approaches is evaluated here in terms of its potential for providing useful information to decision-makers within the context *SFAC No. 2's* discussion of the need for the information qualities of relevance and reliability.

Models Which Assign a Total Value to Intellectual Capital Based on the Difference Between Market Capitalization of Stock and Book (or Replacement Cost) of Net Assets.

Better known examples of market capitalization models include Sveiby's *invisible balance sheet*, the Investor Assigned Market Value (IMVA), and Tobin's "Q" (Grossman, 2006; Bontis, 2001) Models may or may not disaggregate the intellectual capital amount computed in this way into its various component pieces (Bhartesh and Bandyopadhyay, 2005).

Information of this type is typically justified as being necessary because it provides external users of financial statements information needed to better predict firm valuation using the balance sheet. Putting aside for the moment the questionable assumption a primary use of the balance sheet is to measure a firm's value, or even the best way to measure a firm's value is through its balance sheet, the particular metric used in this approach, *total market capitalization less book or replacement cost of net assets,* while simple and objective, has serious conceptual flaws. First, though it at may at first appear to provide a reasonable proxy for the value of unreported intellectual assets, over time as a measure it has proven to be unstable. As general stock market and trading sentiments change, so does the measured value of intellectual capital. Market fluctuations trigger rather large changes to measured intellectual capital in both relative and absolute terms suggesting as a measure it may not have good *representational faithfulness* in terms of the underlying knowledge and knowledge assets being measured. Presumably they should not fluctuate so widely from year to year. In a bull market, intellectual capital appears to be large and growing; one or two years later, in a bear market environment, or after some significant unpredictable negative event such as a major lawsuit patent infringement ruling, intellectual capital all but disappears, and this in spite of activities and investments being made by the firm that might be expected to increase intellectual capital. These rather unpredictable and counterintuitive behaviors of intellectual capital, suggest the

representational accuracy of the measure and its concept validity are seriously flawed and confounded by general changes to market sentiments (Rodhov and Leliaert, 2002; Bhartesh and Bandyopadhyay, 2005).

Persuasive arguments also can be made the balance sheet does not have as its primary purpose the prediction of equity value (Maines, Bartov, Fairfield, and Hirst, 2003). Rather, balance sheets historically have been used by creditors to assess potential liquidation values, should debts not be repaid as required (Holthausen and Watts, 2001). Adding intellectual assets to the balance sheet does not serve this purpose in any way since intellectual assets are rarely transferable into cash at liquidation.

So how does one predict firm valuation from financial statements? Historically, discounted cash flows models based on company earnings have been nearly universally accepted as the best approach to estimate firm worth and are most highly correlated with it.

Finally and most importantly, the logic of defining intellectual capital as *total market capitalization less book or replacement cost of net assets* for the purpose of better assessing market capitalization (already assumed in the definition) is tautological and circular reasoning (Jenkins and Upton, 2001). Such a definition includes no information. Put another way, when measured like this, nothing about intellectual capital is understood that was not already understood. Annual reports already provide both pieces of information included in the definition. Data for calculating the difference between market and book value of net assets is not only available but is a widely used metric, the ratio *market to book value*. It is illogical to suggest balance sheets are now irrelevant because they do not provide sufficient information about total firm value when the solution being suggested is to subtract reported book value from the known market capitalization stock, and then label the difference *intellectual capital* to better predict the value of market capitalization of stock. To measure intellectual capital in this fashion adds nothing and predicts nothing.

There is a second and separate reason sometimes used to support including measures of intellectual capital on the balance sheet unrelated to firm valuation. This second justification says it is information needed by managers who manage these resources (i.e. what is measured is managed"). Again on closer inspection the logic does not hold up. If you define intellectual capital as the total difference between market and book value, the difference itself which is already known, the measure of a "black box" lump sum adds no insight into the nature of what has been measured. Presuming as suggested above the

measure itself is seriously flawed and confounded by changes in general market sentiments, the saying "what is measured is managed" is better stated in this case as "what it artificially measured is artificially managed".

In short, approach number one for measuring intellectual capital is seriously flawed in terms of information *relevance.* What financial decision is assisted? Information not helpful to financial decision-making is by definition not relevant. Additionally when intellectual capital is defined as it has been in approach number one, there are flaws with respect to *reliability* in terms of *representational faithfulness*. The instability of the measure over time clearly suggests it has serious conceptual flaws.

Models Inferring a Total Amount of Intellectual Capital Through Comparing A Company's Particular *Return on Assets* with a Benchmark *Return on Assets*

Return on asset (ROA) based measures of intellectual capital include Stewart's Economic Value Added model (EVA), the Human Resource Costing model (HRCA), and the Knowledge Capital Earnings model (Grossman, 2006; Stewart, 1997). Return on asset ratios are calculated by dividing earnings by reported total assets. Under ROA models for measuring intellectual capital, a particular company's ROA is computed and compared to an industry average or other benchmark ROA. If a company has an ROA less than or equal to the benchmark, it is presumed to have no intellectual capital. If its ROA is higher than the benchmark it is presumed to have unrecorded intellectual assets which because missing from the denominator cause the company's ROA to be above normal. Using simple algebra, an exact amount of intellectual assets can be inferred. This is the amount of increase to the denominator needed to cause a company's ROA to drop to the benchmark amount. Amounts of intellectual capital calculated in this way are sometimes disclosed as one lump-sum and sometimes disaggregated into several broad categories.

Advantages of the return on asset measure of intellectual capital are its simplicity and its total reliance on readily available financial statement numbers (Bhartesh and Bandyopadhyay, 2005). Disadvantages, which are many, include its lack of supporting theory for selecting one benchmark over any other, instability of measured amounts of intellectual capital over time (as net income changes from year to year), and a failure of the measure to provide any insights into the components of intellectual for management (Rodov and Leliaert, 2002). This is another "black box" approach. Another troubling aspect of this approach is the assumption that companies with ROAs below the benchmark have no intellectual

capital whatsoever, an implausible idea in many cases. Additionally the amounts of measured intellectual capital are poorly correlated with the gap between market capitalization of shares and book value of net assets which troubles some. Given its lack of supporting theory and its instability, this measure of intellectual capital has been considered by many to be the least promising approach for measuring intellectual capital of the three (Rodhov and Leliaert, 2002).

In terms of measurement theory, the ROA approach fails for many of the same reasons the market capitalization approach fails. In terms of *relevance*, the model provides little information useful in assessing firm valuation or useful in understanding/managing intellectual capital itself. Under this approach firms having little or no measured intellectual capital still trade at inexplicably high multiples of their book values, while other firms having rather large measured amounts of intellectual capital have lower market to book ratios. The approach is also subject to criticism with respect to its *reliability,* especially in terms of *representational faithfulness*. Evidence is found in the unstable behavior of the measured amount over time as net income fluctuates, in the failure of measured results to correlate well with market to book value ratios, and in the absence any underlying theory guiding selection of a suitable benchmark. All of these suggest a measure that provides at best a seriously flawed picture of the underlying construct.

Models Attempting to Subjectively Identify the Individual Components Of Intellectual Capital and Then Subjectively Assign a Dollar Values to Each.

Models that attempt to directly identify and measure the individual components of intellectual capital 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). These models attempt to identify and list the individual components of total intellectual capital and then assign dollar values to each. Not all models assign dollars in the same fashion. Some models attempt to assign dollars to intellectual capital components based on the historical cost of inputs used to develop them. Others assign dollars to intellectual capital components based on their estimated current market values which might be replacement costs, current trading prices, or appraisal values. Still others assign dollars to intellectual capital components based on estimated discounted cash flows related to the specific benefits believed to accrue from the intellectual capital component. What is conveniently overlooked by all three approaches (or perhaps just not well understood) is that **none** are even achievable my means other than

wild guessing. The potential for major error and manipulation very real. Input costs (historical costs) of components of intellectual capital is almost always unknown and unknowable. Many such costs of developing knowledge or knowledge management processes have been incurred over several decades of time. The direct labor associated with developing these assets has likely served multiple purposes in murky ways, has been expensed as incurred over years and years and could not then (or now) be approximated with any reasonable degree of accuracy or objectivity. The situation with replacement costs is no better. Most unreported knowledge assets of this type have never been bought or sold or considered as separate salable items in second-hand markets. Finally even the idea of identifying specific cash flows associated with particular intellectual capital components is clearly a fool's game, and will never be otherwise due to inherent multiplicity of causes and complex events responsible which together lead to the eventual cash flows which result.

While the direct approach (assuming for the moment it were remotely possible) would provide the most appealing and satisfying measures of intellectual capital, it is also the most complex, the most subjective, and by far the most unachievable of the three approaches.

Rutledge (1997) despairs at the very large number of elements intellectual capital researchers seem to believe make up total intellectual capital. He points out the Leif Edvinsson model which includes 164 different elements (not including subcategories) all requiring separate financial measures. Commercially available measurements of intellectual capital components have been growing in number rapidly, are very detailed and complex, but still with no basic agreement or convergence in thinking about what the specific components are beyond broad categories. This alone is a clear indicator of the subjectivity involved in naming the components much less valuing them. Protagonists for measuring components of intellectual capital have yet even to agree whether it is more desirable to develop a single generic list of components for use by all companies, or whether each company should develop its own unique list of components (Hunter, Webster, and Wayatt, 2005). Bontis (2001) further notes many companies currently produce long lists with multiple indicators of intellectual capital components only to weigh them all equally. He believes such a 'devoid-of-theory' approach results in complex measures of intellectual capital that are invalid.

Further hampering advances in the development of the direct approach has been the failure by intellectual capital experts to even minimally agree on a basic definition of intellectual capital after twenty years of discussion. For example, at the 3rd International Conference on the Management of Intellectual Capital in 1999, eighty of the world's top intellectual capital experts consensually agreed that it is still too early to talk about IC definitions. According to the eighty experts, the nature of intellectual capital is as yet mostly unknown (Seetharaman, Sooria, and Saravanan, 2002). Hunter, Webster, and Wyatt (2005) conclude because in most cases intellectual capital cannot be seen, cannot be owned, cannot be used as collateral, has uncertain value, and may not even be separable from the organization, it is extremely difficult to measure in any meaningful way..

If for the moment we assume the 164 or so separate components of intellectual capital identified by Leif Edvinsson comprise a fairly accurate and complete list of the components, even then valuing each one remains utterly subjective. No matter whether one expects to use historical costs of inputs, replacement values, or discounted cash flows because none are known or knowable with reasonable accuracy. Difficulties in identifying separate values for each of the components of intellectual capital are not likely ever to be overcome. Many components are not independent of others, many are not salable in the sense of traditional property; most have poorly understood property rights and borders protecting the firm from use by others or protecting the firm from complete loss should a knowledge employee quit; many of the components evolve internally over very long periods of time through complex multifaceted activities whose costs cannot be rationally allocated to a single activity (Maines, Bartov, Fairfield, Hirst, et.al., 2003). Here is how Rodov and Leliaert (2002) have described the process proposed to value the components of intellectual assets in their FiMIAM model which they say "*builds on the advantages of most of the earlier models, being both comprehensive and quantitative yet still sufficiently concise and simple, and linking IC value to market valuation over and above book value".*

Step 1: Determine total "realized intellectual capital" (market value of aggregate stock less book value of reported net assets).

Step 2: Identify the relevant components of intellectual capital. (No guidance.)

Step 3: Assign relative weights to each intellectual capital component. (No guidance other than it will be done by top management applying judgments about the relative importance of each component to total intellectual capital.)

Step 4: Justify the coefficients determined in step 3. (No guidance.)

Step 5: Assign dollar values to each component by multiplying the coefficient times "total realized intellectual capital" as defined in step 1.

The high degree of inherent subjectivity in steps 2, 3, and 4 is readily apparent.

Revisiting measurement theory one last time, and particularly the concept of *reliability* (i.e. verifiability, representational faithfulness, and freedom from systematic bias), the problems associated with this model are immediately apparent. First, if intellectual capital literature is any indicator, twenty sets of independent experts asked to develop the list of components, and then to determine appropriate coefficients for the components, and then to elaborate their reasons would all come up with very different lists and weights. Results, therefore, are by definition subjective. They fail the *verifiability* criterion of reliable financial information. Second, as discussed before, measures of value assigned to subjectively determined and probably overlapping components of intellectual capital, the grand total of which is forced to equal an unstable (over time) difference between total market value of company stock and book value of net assets will very likely not accurately measure the 'value' of the component (whether 'value' is assumed to be cost, market, or discounted flow). Third, the criterion *representational faithfulness* requires that there exist a known reason to believe, either historical in nature or some other associative principle, that financial measures reasonably approximate what they are purported to measure. There is no theory developed nor historical data in place supporting these associations in this case. Fourth and finally, *reliable* information is that expected to be relatively free from systematic bias. In the present case, it seems likely that the measures are primarily management rather than accurate descriptions of objective reality. In short, the reliability of information generated by the direct approach is very unlikely to produce information of sufficient quality to be of any use to decision-makers. While the information could be useful if it were reliable, it is not reliable. As with a weather forecast predicting a tornado at 2:00 p.m. on a particular Thursday four months hence, if the information is accurate it would be useful, but because of measurement limitations it is not granted credence by sensible people and does not effect their actions.

Conclusions

It has been argued that from the perspective of financial measurement theory and decision-making needs, putting intellectual capital on the balance sheet is an unworkable idea. Placing an aggregate difference between market value and book value of company stock on the balance sheet gives no new information to investors and in fact may confuse other aspects of financial analysis. It is a "black box" approach to reporting intellectual capital and does nothing to help management understand or manage intellectual capital. If the motivation for including intellectual capital on the balance sheet is to equate balance sheet net assets with firm market valuation, it is a specious idea, circular in logic, and without information. Other more direct models for assessing firm value are less much subjective (e.g. discounted earnings models) and much more practical. Proposed direct measures of the component parts of intellectual capital are inherently subjective and they fail the reliability requirement of useful information.

Finally, unwillingness on the part of the financial accounting community to report intellectual assets on the balance sheet is not a function of laziness, nor is it oversight, nor is it unwillingness to change with the times. Rather it is grounded in the bedrock belief that financial measurements do have practical limitations. To ignore these practical limitations does more harm than good to the external user.

Intellectual capital is clearly a worthwhile concept, useful for understanding the dynamics of modern competitive success. It is not **measurable** as a balance sheet asset. After twenty years of trying, none of the approaches suggested as ways to measure intellectual capital have shown any promise of clearing the bar of information relevance and reliability. Belling the cat of intellectual capital? A nice sounding idea, but who will do it?

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THE EFFECT OF THE SARBANES-OXLEY ACT ON SMALL BUSINESSES

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Abstract

The passage of the Sarbanes-Oxley Act in 2002 was meant to signal the end of an era. Corporate mismanagement and accounting cover-ups were to become memories of a bygone time as this sweeping new legislation would root out the problems in corporate America and prevent future mismanagement. The shock of thousands of Americans left without retirement as well as a plummeting stock market will long be remembered. Research since then has focused on changes brought about with regard to large corporations. This essay attempts to answer the question, what has the impact of SOX been on smaller businesses with less ability to absorb the costs of compliance with this new legislation? In it I will attempt to demonstrate that the Sarbanes-Oxley Act has been effective in some areas of corporate governance, but smaller businesses have paid a large price.

How SOX Came About

From the end of 2001 into 2002, the American public was shaken by revelations of corporate mismanagement at Enron and by other corporate scandals that rocked the stock market and caused significant financial losses. Their response was to call for reform in corporate governance and Congress began to formulate legislation to respond to these concerns. In April 2002 the House passed the Oxley bill. The Senate supported the less stringent Sarbanes bill but after WorldCom revealed in June that it too was having financial problems, the Senate Democrats and Republicans cooperated to pass in July legislation that was a combination of both proposed bills. On July 30, 2002, President Bush signed the Sarbanes-Oxley Act (hereafter SOX) into law.

Romano (2005) suggests that shifts in the national mood and turnover of elected officials, as well as focusing events such as the Enron and WorldCom scandals opened "policy windows" for corporate policymakers to promote their agenda. Members of Congress were concerned about reelection and rushed to pass legislation which would convince voters that they were cracking down on corporate malfeasance.

She notes that the House bill was passed after only 1 day of debate and the Senate bill was passed after a week of debate.

Groups such as the business community and members of the accounting profession felt that despite their expertise they were unable to have much input on this legislation due to the collapse of Enron and its auditor, Arthur Anderson. Others would argue that Congress was heavily influenced by business interest groups who opposed tough regulation, and that they deliberately passed legislation which appeared tough enough to please general voters yet was ineffective enough to please business interest groups. Romano (2005) writes that Congress even ignored research suggesting that the proposed mandates would not be effective.

McDonnell (2003) points out that many of the SOX provisions required operationalization through the creation of new SEC rules and studies. Since they were already understaffed and under pressure for quick results, the SEC often repeated SOX statutory language rather than coming up with creative ways to carry it out or providing more guidance on how the provisions should be implemented.

The American financial system relies on officers making decisions that best advance shareholders' interests due to the presence of a strong board and other monitors. It became apparent during this period of scandals that some corporate directors and other officers were motivated not by the shareholder's interests or even the company's interests but purely by selfish motives. This is evidenced by Kenneth Lay urging employees to continue to buy Enron stock even when he knew that the company was in deep financial trouble.

SOX Specifics

SOX is an attempt to strengthen corporate governance in America (McDonnell, 2003). Specifically, SOX requires auditors to submit a report to the U.S. Securities and Exchange Commission (hereafter SEC) auditing committee listing, among other things, critical accounting policies and the presence of at least one "financial expert" on their audit committee. SOX affects corporate regulation by auditors, lawyers, credit rating agencies, etc.

Buyer (2005) states that in the business community, the SOX provisions that are often cited with regards to compliance are section 302 which "defines corporate responsibility for financial reports, and the internal controls used to ensure the veracity and sanctity of corporate data" and section 404 which

addresses management's assessment of the integrity of these internal controls. The regulation that got the most media attention was that CEO's and CFO's must now certify that they have reviewed their company's internal financial report.

Eldridge and Kealey (2005) noted that the internal control report required by SOX Section 404(a), Item 308(a) must include:

1. Management's statement of responsibility for internal controls over financial reporting
2. Identification of the framework used by management to evaluate the effectiveness of these internal controls
3. Management's conclusion regarding the effectiveness of these controls and disclosure of any material weaknesses
4. Confirmation by management that its auditors have issued the required attestation report on these controls.

Another new provision that according to McDonnell (2003) is one of the most potentially effective is the forfeiting of bonuses after restatements. The corporate scandals that precipitated SOX also led to the SEC pressuring the New York Stock Exchange and Nasdaq into proposing extensive new rules on corporate governance. These rules require that a majority of a company's board of directors be independent, and that they become more active in monitoring companies. The new rules also forced companies to form 3 committees consisting of independent directors: audit, compensation, and nomination/governance.

Shareholders now have to approve more equity compensation plans, and this has brought about increased pressure from the insurance industry to adjust directors' and officers' insurance packages to protect against claims of excessive compensation packages (Shearer, 2005). They require companies to disclose their governance guidelines and codes of business conduct. The Public Company Accounting Oversight Board established by SOX oversees audits of public companies that file reports with the SEC. Companies could be de-listed for violating SOX regulations. SOX also authorized new funding for the SEC.

Positive Impact of SOX

McDonnell states that the effectiveness of SOX lies in the subsequent reforms made by bodies such as NASDAQ and SEC. SOX has increased pressure on regulators and corporations to "reform themselves, before Congress does more, and worse" (2003). The SEC, major stock markets etc. are more expert and knowledgeable on corporate governance, but are also more biased. He notes that since the passage of SOX, for example, the Delaware courts (an important state regulator) have toughened the definition of director independence, weakened protection of ordinary business decisions and weakened corporations' abilities to lock-up acquisition deals. Judicial decisions in Delaware are influential on corporate governance and Delaware courts seem to be responding to SOX when they toughen standards for director independence.

Critique of SOX

Some say that Congress acted too quickly, making hasty decisions that were not well thought out and including provisions that were superficial responses to corporate governance problems (McDonnell 2003, Romano 2005). While the public's intention is that SOX would have a drastic effect on the way that corporations are run, some have argued (McDonnell 2003, Romano 2005) that despite its appeal SOX has done little in and of itself to change corporate governance. It introduces little new legislation and primarily duplicates existing rules. Romano (2005) goes so far as to refer to SOX provisions as "recycled ideas."

McDonnell (2003) suggests that the penalties for poor corporate governance have not changed drastically with the passage of SOX, and adds that it is possible for executives to comply with SOX and not run or monitor a company very well. However, he proposes that SOX will probably cause companies to be run more conservatively for the following reasons:

- Directors may choose not to take the chance of being caught
- Companies will seek more legal advice which is likely to be conservative
- Increased media and professional attention given to the new rules will make them carry more weight
- The perception that others are behaving differently may cause company officers to modify their own behavior.

He also notes that many companies are now opting to compensate executives with restricted shares rather than stock options, which reduces their incentive to cover up problems that would affect a company's stock price. Buyer (2005) writes that the SOX stipulations regarding personal liability have had the positive effect of causing non-active board members to leave their positions, although it has also deterred some highly qualified managers from joining boards.

McDonnell (2003) notes that the exchanges had adopted fairly strong audit committee rules shortly before the passage of SOX and, therefore, the new legislation made little difference. Others argue, as does Romano (2005), that previous research demonstrates that independent boards/audit committees do not improve performance and having too many outsiders on the board can in fact, reduce performance. She contends that complete independence has been found to be less significant than the expertise of directors, and although SOX mandates complete independence of audit committees it does not mandate the presence of a financial expert on such committees. She also writes that there is no connection between the provision of nonaudit services and audit quality. While Romano's arguments against more independence on boards and of auditing consultants is highly questionable, she does raise issues that may have been overlooked in the rush to pass this legislation.

Another issue that Romano (2005) raises is the prohibition by SOX of corporations arranging or extending credit to executive officers or directors. She argues that any financial losses to officers or directors from eliminating credit for stock purchases or stock options can be made up by renegotiating their contracts, often at a greater financial cost to the company. There needs to be further clarity on the types of loans that should be prohibited.

Challenges of SOX Compliance

Companies with a market capitalization of $50 million to $300 million are commonly referred to as "microcaps" (Investopedia Dictionary). According to Romano (2005) compliance costs for companies with annual revenues of over $5 billion have been estimated at $2.9 million per company, companies with annual revenues under $25 million are estimated to spend an additional $222,200 on SOX compliance. These costs are more easily absorbed by larger companies than those with more limited budgets.

The cost of completing the additional reporting required by SOX includes increased internal personnel wages and benefits, external consulting fees, and new or updated technology. According to

Ettredge, Li and Sun (2006) 49% of the respondents from Fortune 1000 companies in their study believe that their company benefited internally from implementing SOX, but 70% believe that the costs of compliance outweigh the benefits. An unintended consequence of SOX, for example, is that companies are paying directors more due to the increased risk of litigation and the increase in time spent implementing safeguards. The increased cost that companies are incurring in director salaries is harder on smaller companies with less capital.

Romano (2005) explains that it has been estimated that the cost of going public almost doubled after SOX, primarily due to higher audit insurance and outside-director fees. This may deter international firms from listing on American exchanges, or cause those already listed to delist and transfer to international exchanges, thus making the purchase of their stocks more expensive for American investors.

According to O'Connor (2005) the passage of SOX and its increased costs have indeed led to fewer small, venture capital companies going public. She suggests that many are choosing to list on international exchanges such as the London Stock Exchange's "AIM" which has experienced a significant increase in recent international listings. This reality is demonstrated by the decision by Northwest Indiana Bancorp to cancel their plans to de-register their stock 2 weeks after the SEC signaled that it would recommend delaying and perhaps lifting some of the burdens that SOX places on small businesses (Financial Wire, August 29, 2005). In addition, Big Four accounting firms have dropped many smaller clients due to staffing shortages and increased auditing costs. Smallcap firms are thus having a difficult time finding new auditors from small/mid-sized accounting firms.

Financial strain is not the only challenge to implementing SOX. Buyer discusses the unique challenges faced by information technology staff in compliance with SOX. She argues that despite increased responsibility for IT departments, there is much less direction given on how to meet the goals and obligations SOX set out for IT personnel. Some of the problems faced by many companies are insufficient password control and documenting network/system changes. Companies must provide current information regarding staff or consultants with access to financial data as well as physical/logistical access to the datacenter, the contents of their software library and plans for its maintenance, and standard operating procedures which is advisedly based on the principle of least-privilege (users should be given no more privilege or access to data than necessary to perform their jobs). Making the necessary changes can be labor

intensive and segregation of duties is a bigger challenge for small companies where staff are often required to perform multiple duties.

According to Ettredge et.al. (2006) between 2003-2006 the SEC accelerated the deadlines for filing Form 10-Ks from 90 days to 75 days then 60 days, but consequently postponed implementing the 60 day deadline in August 2004 and December 2005 since firms were having a difficult time meeting it. In December, 2005 the SEC's Advisory Committee on Smaller Public Companies recommended to the full SEC that smaller businesses (those with a market capitalization of under $700 million, no longer be required to comply with SOX's Section 404 provisions (Ettredge et.al., 2006).

As Shearer (2005) notes, SOX has also impacted the purchasing of companies as SOX compliance is now a salient (and sometimes primary) factor considered by potential buyers. He quotes Marshall Sonenshine (Chairman of the investment bank Sonenshine Partners) as saying, however, that SOX compliance does not stop deals completely but creates more accountability and confidence. The financial climate has also led to the reduction of anti-shareholder provisions that would previously go unnoticed in IPO's and mergers, according to Richard Ferluato of the AFSCME (Shearer, 2005).

Conclusion

There are many positive effects of SOX. McDonnell (2003) believes that SOX appeals to both regulators and private industry participants. The most important changes caused by SOX are formally independent board directors, the formation of audit, compensation and nomination committees by boards, and also increased internal controls. McDonnell (2003) notes that many companies are now opting to compensate executives with restricted shares rather than stock options. SOX, therefore, seems to have improved the way that American companies are run.

Those opposed to SOX would argue as Romano (2005) did, that the SOX provisions should be made optional and not mandatory. Matthew A. Kozad (2005) has assisted companies in complying with SOX and notes that they do not always understand how implementing effective internal controls could make them more efficient and save them money. He suggests using checklists for employee responsibilities and to monitor processes within the company. These save time during reviews. He also recommends spending time updating company policies and procedures to avoid control deficiencies, as well as creating a

disclosure committee of senior management from all areas of the organization to share information and detect disclosure items.

Segregation of duties is a challenge for most companies, particularly ensuring that an employee is not responsible for both performing and reviewing a process, as well as restricting access to records. Lastly, the financial activities of service providers such as an outsourced vendor, must be considered. Obtaining a SAS 70 Type 2 report from the service provider is acceptable, or the company should demonstrate that there are adequate internal controls in the service provider's company that would detect errors and omissions.

Complying with SOX is particularly difficult for smallcap firms with limited financial resources. It results in an average of $222,200 spending increases on fees for directors, fees for personnel and/or consultants to complete financial reports, additional IT staff or software to ensure that data is protected, as well as increased personnel time spent on additional reporting requirements (particularly due to the lack of clarity provided on implementing required changes) and difficulty finding new auditors from small/mid-sized accounting firms. All this has resulted in fewer small, venture capital companies going public. While there may be little chance that the SEC's Advisory Committee on Smaller Public Companies' recommendation that smaller businesses no longer be required to comply with SOX's Section 404 provisions will be approved, serious consideration needs to be placed on making it more effective and less of a financial burden for smaller companies to comply with SOX.

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A Note on Dealer Sales Incentives

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Abstract: This note presents an alternative model of dealer sales incentives involving a monopoly manufacturer selling a product to Cournot-type dealerships. We demonstrate that the provision of sales incentives, by the manufacturer, to dealers is profitable both to the manufacturer and to the dealers. This finding provides a rationale for such incentives that has not been previously discussed in the literature.

The classical operating assumption for firm behavior is that firms maximize profit. However, an alternative assumption, that firms maximize sales or at times appear to, has received attention in the literature. One argument as to why firms might maximize sales is that revenue, particularly revenue in the short run, may be linked to firm objectives other than profits. Baumol (1958) and Peston (1959) argue that a high volume of short-run sales might enhance the ability of a firm to obtain funds in capital markets, thereby increasing its long-run rate of growth and profits. Amihud and Kimin (1979) and Vickers (1985) argue that sales may be a more easily achieved and visible management objective than profits. This line of reasoning has directed the discussion of sales maximization as a firm objective toward that of sales incentives to managers provided by owners. The papers of Fershtman and Judd (1987) and Hwang and Mai (1995) develop models of such sales incentives.

The present note develops an alternative model of sales incentives, and points to a rationale for such incentives that has not been previously discussed in the literature. We demonstrate that in the situation of a monopoly manufacturer selling a product to Cournot-type dealers, the provision of sales incentives to dealers is profitable both to the manufacturer and to the dealerships.

We refer to sales in the final market as dealer sales. However, the terms “dealer” and “dealership” could be replaced with “retailer”. The consumers purchase the items from the dealerships or retailers in the final, or retail, market.

The paper is organized as follows. Section I presents the model of the manufacturer and 2 dealerships, deriving the profitability with and without sales incentives. Section II presents the model and results of the manufacturer and *n* dealerships. Section III concludes and provides avenues for future research.

I. A Duopoly Model of Sales Incentives

Assume a product X is manufactured by a monopolist. Constant unit manufacturing costs are denoted C_M. The monopolist distributes the product via two dealerships, to which it sells at a unit price P_M. The dealers in turn distribute the product to the final market. A fixed proportion production function is assumed at the dealer level. For further simplicity, production is normalized so that one unit produced by the manufacturer equals one saleable unit at the dealer level. Inverse demand for the final product is assumed to be:

$$P_R = A - B(X_1 + X_2). \tag{1}$$

The economics of distribution in the above setup can be solved as a two-step process. First, the dealers compete for sales resulting in a subgame equilibrium. Total dealer derived demand from this competition is then used by the manufacturer to determine the optimal manufacturer's markup of price over marginal cost. This price determines both the manufacturer's and dealers' profits.

For simplicity, we assume that the only cost to the dealers is the price of the manufactured product to be resold. Product distribution costs can be assumed for the dealer without altering the substance of the analysis. However, if such costs are introduced they must be restricted to be less than any marketing costs incurred by the manufacturer directly marketing the product. If this is not the case then the profit maximizing decision for the manufacturer would be to vertically integrate, bypassing the use of dealerships altogether.

Dealers are assumed to compete in Cournot fashion. We consider dealer behavior both without and with manufacturer dealer incentives.

Without dealer incentives profits of i^{th} dealer, $i = 1, 2$, are:

$$\Pi_i = (P_R - P_M)X_i = [A - B(X_1 + X_2)]X_i - P_M X_i. \tag{2}$$

As is well known, the firm and market output are, respectively, given by:

$$X_i = \frac{(A - P_M)}{3B}, \tag{3}$$

$$X = \frac{2(A - P_M)}{3B}. \tag{4}$$

The manufacturer's profits can be expressed using (4) and the manufacturer's price cost margin:

$$\Pi_{MFG} = \frac{2(A - P_M)(P_M - C_M)}{3B}. \quad (5)$$

Maximizing (5) yields the optimal manufacturer price $P_M = (A + C_M)/2.$

Note that dealers cannot earn a profit by reselling the manufacturer's product unless $A > C_M$. This, in turn, implies that $A + C_M > 2C_M$. Therefore, the manufacturer prices its product above marginal production cost C_M.

Substituting the manufacturer's price with equations (3) and (4) into equations (2) and (5) yields the dealers' and manufacturer's profits, expressed in the following theorem:

Theorem 1: Assume a linear demand expressed as in equation (1) and two Cournot dealerships. If the monopoly manufacturer provides no sales incentives to the dealers then total equilibrium dealer profits are $(A - C_M)^2/18B$. *Total manufacturer profits are* $(A - C_M)^2/6B$.

When the manufacturer provides sales incentives to the dealers, each dealership engages in Cournot competition with the following objective function:

$$OBJ_i = \lambda_i \Pi_i + (1 - \lambda_i) PX_i + INCENT/2, \quad \lambda_i < 1. \quad (6)$$

Equation (6) shows the dealership's objective as a weighted average of profits and sales, with weight λ_i attached to profits. The weight is chosen by the firms during Cournot play. This type of objective function was first introduced by Fershtman and Judd (1987) and later used by Hwang and Mai (1995). The idea is to allow the dealers to place less than 100 percent emphasis on profits and place additional emphasis on sales, and is consistent with dealerships pursuing an aggressive strategy in the final product market, while still being somewhat concerned with product costs. Whether the dealerships prefer to engage in a mixture including such sales maximizing behavior rather than pure profit maximization will depend on the sales incentives provided by the manufacturer. For simplicity, this incentive is modeled as a lump sum equally divided between the two dealerships.[1]

[1] Lump sum incentives are not uncommon. Manufacturer-to-dealer incentives of this sort in the automotive world are often referred to as "volume incentives" or "dealer cash incentives". These incentives are

The solution to the game is obtained by writing (6) as:

$$OBJ_i = [A - B(X_1 + X_2)]X_i - \lambda_i P_M X_i + INCENT/2. \tag{7}$$

Maximizing (7) results in the reaction function for the i^{th} dealer:

$$X_i = \frac{(A - \lambda_i P_M)}{2B} - \frac{X_j}{2}. \tag{8}$$

Solving (8) for the two dealerships yields the following outputs and market price:

$$X_1 = \frac{A + (\lambda_2 - 2\lambda_1)P_M}{3B}, \tag{9}$$

$$X_2 = \frac{A + (\lambda_1 - 2\lambda_2)P_M}{3B}, \tag{10}$$

$$P_R = \frac{A + (\lambda_1 + \lambda_2)P_M}{3}. \tag{11}$$

Realized profits of the i^{th} dealer are obtained from equations (9) through (11):

$$\Pi_i = (P_R - P_M)X_i = \frac{[A + (\lambda_i + \lambda_j - 3)P_M][A + (\lambda_j - 2\lambda_i)P_M]}{9B} + \frac{INCENT}{2}. \tag{12}$$

Dealerships use (12) to find the profit-maximizing weights λ_i, given by:

$$\lambda_1 = \lambda_2 = \frac{6}{5} - \frac{A}{5P_M}. \tag{13}$$

This weight will be on the interval [0, 1] if $A > 5P_M$. Use of (13) in (8) and (9) yields the individual dealer sales volume in units $X_i = 2(A - P_M)/5B$. Note that this output is greater than the output in (3). Emphasis on sales results in more aggressive behavior on the part of the dealerships.

The manufacturer's profits can be expressed using this output and the manufacturer's price cost margin:

$$\Pi_{MFG} = \frac{4(A - P_M)(P_M - C_M)}{5B} - INCENT. \tag{14}$$

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awarded "…if dealers sell a certain number of cars in a given month or quarter…" (Valdes-Dapena, 2004 and Edmonds, 2005) Lump sum incentives can be viewed as quantity discounts. Zerrillo (1995) writes that these, "…have been an effective tool for promoting sustained effort in high-volume products such as electrical supply and lower-volume, high-ticket items such as automobiles."

Maximizing (14) yields the optimal manufacturer price $P_M = (A + C_M)/2$. Use of this price and (13) into (12) and (14) yields the dealer and manufacturer profits. These profits are expressed in the following theorem:

Theorem 2: Assume a linear demand expressed as in equation (1) and two Cournot dealerships. If dealers place additional emphasis on sales as in equation (5) then total equilibrium dealership profits are $(A-C_M)^2/25B + INCENT$. *Total manufacturer profits are* $(A-C_M)^2/5B - INCENT$.

A comparison of Theorem 1 and Theorem 2 reveals that dealer profits are less with the combined profit/sales objective than if dealers strictly maximize profits, since 1/25 < 1/18. Clearly, it does not benefit the dealers to distort their objective toward sales maximization without the sales incentive, *INCENT*. However, since 1/5 > 1/6, the manufacturer receives greater profits if the dealer distorts it objective toward sales, provided the sales incentive offered is sufficiently small. The source of this profit for the manufacturer is due to its ability to maintain the markup of price over cost, $P_M = (A + C_M)/2$, as sales increase at the retail level due to the incentives.

The most interesting implication of these two theorems is that the manufacturer's net gain due to the dealers' distorted objective outweighs the dealers' loss. Total dealer's loss is in the amount of $7(A - C_M)^2/450B$, while the manufacturer's gain is $15(A-C_M)^2/450B$. This means that by offering a total incentive package to the two dealers in an amount of $7(A - C_M)^2/450B < INCENT < 15(A - C_M)^2/450B$, the manufacturer can induce the dealers to distort their objectives toward sales. By doing so the manufacturer also gains additional profit. This gain in total profit to manufacturers and dealers helps to explain the use of sales incentives by manufacturers.[2]

II. An *n*-Firm Model of Sales Incentives

Next consider the situation in which there are *n* dealerships. Our aim is to study the effect that competition between dealers has on the manufacturer's incentive to offer sales incentives to downstream retailers. Inverse demand at the retail level will therefore be given by

[2] To calculate an appropriate level for *INCENT*, the manufacturer must know the parameters *A*, *B*, and C_M. Given this knowledge, the manufacturer could use sales quotas for the dealerships rather than sales incentives.

$P_R = A - BX = A - B\sum X_i, i = 1,...,n.$ For the standard Cournot solution in which there are no sales incentives, profits of the i^{th} dealer are:

$$\Pi_i = [A - BX]X_i - P_M X_i. \tag{15}$$

The solution to (15) is well known, and yields the following dealership output, market output and equilibrium retail price:

$$X_i = \frac{A - P_M}{B(n+1)}, \tag{16}$$

$$X = \frac{n(A - P_M)}{B(n+1)}, \tag{17}$$

$$P_R = \frac{A + nP_M}{n+1}. \tag{18}$$

Use of (17) and (18) in the manufacturer's profit function obtains:

$$\Pi_{MFG} = \frac{n(A - P_M)(P_M - C_M)}{B(n+1)}. \tag{19}$$

Maximizing (19) results in the manufacturer price $P_M = (A + C_M)/2.$ As before, the manufacturer's price is independent of the dealership market structure. Use of this price results in the following total dealer and manufacturer profits of:

$$\Pi_{Dealers} = \frac{n(A - C_M)^2}{4B(n+1)^2}, \tag{20}$$

$$\Pi_{MFG} = \frac{n(A - C_M)^2}{4B(n+1)}. \tag{21}$$

For the situation in which dealers have a mixed profit-sales objective, begin with the generalization of (7):

$$OBJ_i = [A - BX]X_i - \lambda_i P_M X_i + INCENT/n. \tag{22}$$

Maximization of (22) results in the i^{th} dealership's reaction function:

$$X_i = \frac{A - BX_i^{'} - \lambda_i P_M}{2B}, \tag{23}$$

where $X_i^{'} = X - X_i$. Summing over all dealerships, and noting that

$\sum X_i^{'} = nX - \sum X_i = (n-1)X$, yields:

$$\Sigma X_i = X = \frac{nA - B(n-1)X - \Sigma\lambda_i P_M}{2B}. \tag{24}$$

Solving (24) results in the market output:

$$X = \frac{nA - \Sigma\lambda_i P_M}{B(n+1)}. \tag{25}$$

Substitution of (25) into (23) and use of the definition $X_i^{'} = X - X_i$ yields the dealer's output while the retail price is obtained from the inverse demand curve and (24). These are, respectively:

$$X_i = \frac{A + P_M(\sum_{j \neq i} \lambda_j - n\lambda_i)}{B(n+1)}, \tag{26}$$

$$P_R = \frac{A + P_M \Sigma\lambda_i}{n+1}. \tag{27}$$

The dealer price-cost margin $(P_R - P_M)$ with equations (26) and (27) can be used to derive the i^{th} dealer's realized profits in terms of the parameters λ_i:

$$\Pi_i = \frac{[A + P_M(\Sigma\lambda_i - (n+1))][A + P_M(\sum_{j \neq i} \lambda_j - n\lambda_i)]}{B(n+1)^2} + \frac{INCENT}{n}. \tag{28}$$

Differentiating (28) with respect to λ_i, and noting that because of symmetry of response $\lambda_i = \lambda_j$, yields the profit maximizing value of λ_i:

$$\lambda_i = \frac{n(n+1)}{n^2+1} - \frac{(n-1)A}{(n^2+1)P_M}. \tag{29}$$

Substituting (29) into (26) and (27) results in the dealership output, market output, and retail price:

$$X_i = \frac{n(A-P_M)}{B(n^2+1)}, \tag{30}$$

$$X = \frac{n^2(A-P_M)}{B(n^2+1)}, \tag{31}$$

$$P_R = \frac{A+n^2P_M}{n^2+1}. \tag{32}$$

Equations (30), (31), and (32) can be used in an analog of (19) to derive the manufacturer's profit expressed in terms of its price-cost margin. This yields the optimal manufacturer price $P_M = (A+C_M)/2.$[3] Use of this price results in the manufacturer and dealers profits for the case in which dealerships have a mixed sales and profit objective. These profits are expressed in the following theorem.

Theorem 3: Assume a linear demand expressed as in equation (1) and n Cournot dealerships. If dealers place additional emphasis on sales as in equation (15) then total equilibrium dealer profits are $\frac{n^2(A-C_M)^2}{4(n^2+1)^2B} + INCENT$ *. The total manufacturer profit is* $\frac{n^2(A-C_M)^2}{4(n^2+1)B} - INCENT$ *.*

The profits in Theorem 3 can be compared to the profits for the situation in which dealers do not place additional emphasis on sales during competition, which are given in equations (20) and (21). This comparison yields some interesting conclusions.

First, dealer profits in both cases approach zero as *n* increases. This is consistent with our notion of perfect competition, in which free entry of dealerships in the long run results in zero economic profits. Note, however, that profits decrease with $(n/n^2) = 1/n$ for the case in which dealers have a pure profit

objective function, while profits decrease at the rate $\left(n^2/n^4\right)=1/n^2$ when dealers have the mixed sales profit objective function. This means that placing additional emphasis on sales results in a more rapid decrease in profits as dealerships enter the market.

For the manufacturer, an increase in the number of dealers results in a level of profit $(A\text{-}C_M)^2/4B$ for both dealer objective functions. This level of profit is the same as would be realized if the manufacturer bypassed the use of dealerships altogether and sold directly to the retail market.[4] Note that manufacturer profits approach the monopoly profit for both cases at the same rate.

The difference in dealer profits between the objective function in (22) and a pure profit objective function, equation (20), is $\left(\frac{(n-1)(1-n^3)}{(n^2+1)^2(n+1)}\right)\left(\frac{(A-C_M)^2}{4B}\right)$. This difference is negative for $n \geq 2$. Placing additional emphasis on sales always results in lower dealer profits. The difference in manufacturer profits for the two dealer objective functions is $\left(\frac{n(n-1)}{(n^2+1)(n+1)}\right)\left(\frac{(A-C_M)^2}{4B}\right)$, which is strictly positive for $n \geq 2$. As in the duopoly case, the manufacturer benefits when dealers place added emphasis on sales.

The manufacturer's added profit generated by the sales objective exceeds the total dealer losses by the difference:

$$\left(\frac{(A-C_M)^2}{4B}\right)\left(\frac{n(n-1)}{(n^2+1)(n+1)}-\frac{(n-1)(1-n^3)}{(n^2+1)^2(n+1)}\right)=\left(\frac{(A-C_M)^2}{4B}\right)\left(\frac{n(n^4-1)+(n-1)(n^3-1)}{(n^2+1)(n+1)^2}\right).$$

Since the highest power of n in the denominator of this expression is n^6, while the highest power in the numerator is n^5, this difference approaches zero as n increases. This shows that although the manufacturer benefits from increased dealerships, the ability to profitably offer sales incentives decreases as the number of dealerships increases. Additionally, this suggests that sales incentives will be largest when there are a few large dealers competing in the same market. The example that comes to mind is the automobile industry.

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[3] Note that, in each of the cases provided, the manufacturer price is not a function of the number of dealerships or whether the manufacturer offers any sales incentive.

III. Concluding Comments

This note presents an alternative model of dealer sales incentives involving a monopoly manufacturer selling a product to Cournot-type dealers. We demonstrate that the provision of sales incentives to dealers is profitable both to the manufacturer and to the dealers. This finding provides a rationale for such incentives that has not been previously discussed in the literature.

There are a number of avenues for further research. This note presents a model with constant marginal costs for the manufacturer; additional work could usefully examine the robustness to alternative cost functions. The sales incentives used herein are lump-sum whereas future analyses could introduce per-unit incentives. Finally, introducing uncertainty regarding final demand for the manufacturer could yield interesting insights into the provision of sales incentives for dealerships.

All caveats concerning simplicity of our model, of course, apply. Despite these limitations, the central point in this note is one worth further investigation. Dealer sales incentives, under certain conditions, are profitable. Otherwise, why would firms bother to provide such incentives?

[4] Assuming no marketing costs for direct retailing.

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Measuring Consumer Preferences: An Empirical Study

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Abstract

This research focused on the Montana Rescue Mission (MRM) which operates three Bargain Centers' (thrift stores) in the Billings, Montana area. The goal was to increase profits, by improving the customer shopping experience. An initial survey of all Billings area thrift stores, aided the design of a primary survey, conducted at all MRM locations. Two hypotheses were proposed, and the results of the survey rejected the first hypothesis that; prices alone influence the thrift shop customer. The second hypothesis however was accepted, as it was significantly shown that; customer service is more important than merchandise diversity. From this initial step, MRM Bargain Center is now in a better position to analyze their customer preferences, and tailor any marketing strategies toward them.

Introduction

This research project focused on the Montana Rescue Mission (MRM) Bargain Centers. MRM is a non-profit charitable organization that operates three Thrift (secondhand) Stores in the Billings, Montana area. One store is located in the Billings "Heights", the second is in the downtown area, and the third store is located on the Billings "West end". MRM sells merchandise that has been donated from the local community. The staff at MRM; sort merchandise to determine if it is sellable, price the merchandise, and then strategically display it, onto the sales floor.

As MRM wishes to improve their sales, initial secondary research was utilized to examine marketing concepts applicable to the "Thrift Store" businesses. Factors such as understanding consumer behavior, needs, and wants were obtained from secondary research. According to Retail Traffic magazine "Retail strategist and analyst say monitoring and understanding consumer behavior, needs and wants is still the only way to deliver the right brands, products, service and prices to attract ever-pickier consumers" [1]. Successful retailers need to understand consumers' needs and respond to them in a proactive way.

An initial research was conducted where five students acting as consumers, conducted in-store evaluations of all Billings area Thrift store. This analysis benchmarked MRM Bargain Centers with the other area thrift stores, based on thirteen various qualities. The areas of evaluation were: customer acknowledgement by any employee while in a store, courteous and helpful staff, being greeted upon entering a store, and being offered a shopping basket or cart when entering the store.

From this introductory analysis, it was determined that the majority of area thrift stores rank average in all areas. However three thrift stores did stand out among the others were, and they were; The Nearly New Shoppe, The Wise Penny and Goodwill. Two significant issues that were revealed after conducting the competitors' survey were; the lack of employee-consumer interaction, and the lack of merchandise displays.

First, all evaluated stores rated very low on customer service. Eight of the nine stores, including the three MRM locations, did not greet the customer upon entering the store, and all stores failed to offer a shopping basket or cart when the customer entered the store.

Second issue revealed the lack of merchandise displays. All stores were lacking in providing satisfactory merchandise displays, and secondary research supports the analysis and observation that; merchandise displays and apparel mixing, will increase sales and items per transaction.

As the goal of MRM was to increase their sales; MRM's manager wanted to know; which is a more important area to improve; their prices, their selection of merchandise, or customer service? Thus the purpose of the survey was to determine:

- Demographic information
- Frequency of customer visits
- Customer preferences
- Customer attitudes of MRM employees
- Visits to competitors by customers

Do prices alone influence the "Thrift Shop" customer? And do customers value "customer service" over selection variety, at "Thrift Stores"? From these key questions, a twenty-one question in-store survey was designed to research the following two Hypotheses.

H1: Prices alone influence the MRM "Thrift Shop" customer.

H2: Customer service is more important than merchandise diversity, to the MRM "Thrift Shop" customer.

After compiling the results of 130 collected surveys, SPSS software was used to analyze the hypothesis, and it was significantly determined that prices alone did not influence the MRM customer. The second hypothesis was shown to be true; as it was significantly determined that customer service is more important than merchandise diversity (selection).

While these hypotheses were analyzed, other significant marketing information was obtained from the survey results. Customer demographics determined that the average shopper was a married woman, between 25-60 years

old, and had a minimum of two household members. Other useful marketing information revealed that staff friendliness, store location, and atmosphere ranked higher (in terms of most importance) above store prices. It is from this useful customer data, that management now can carefully plan any marketing strategies.

Methodology

The purpose of the survey was to examine marketing issues affecting MRM "Thrift Store" customers. Customer information pertaining to; loyalty, frequency of customer visits, attitudes, preferences, demographic information, visits to competitors, and customer perception of MRM employees and service, was needed to properly answer these management issues. The final version of this survey consisted of twenty-one questions, with nineteen multiple-choice and two open-ended questions. The survey form was divided into three parts; Personal Detail (I), Survey Commitment (II), and Demographic Information (III).

The survey questions were constructed using Likert scales, and Semantic differential scales. These were chosen as they both allow the respondents to indicate varying degrees of agreement or disagreement with a variety of statements about some attitude, object, person or event. The scales varied the available responses between 1-7 points, and used bipolar adjectives or phrases again based on objects, person, or events.

Sampling

Since the lack of time and money played an important part of this research, convenience sampling was used as it was quick and inexpensive. The location and time for the survey was decided by two factors. The first factor was since MRM has three various geographically located thrift stores in the Billings area, surveying all stores would gather a better representation of the MRM thrift store customer. Also a quote system was used, as three teams each surveyed one store each, and each group had a set minimum of completed surveys to obtain.

The second factor utilized weekend mornings to conduct the surveys, because according to the MRM management "Saturday and Sunday mornings were the busiest time periods in all three stores". As the Thrift store business positions itself to a broad marketing segment, meaning all ages and all populations. A judgmental design was used, as this in-store survey was given to everyone who entered the stores, and accepted a survey (thus target responses were anyone capable of filling out a questionnaire form). Again this design was utilized as the effort was to get a good representation of the average MRM customer, and to try to increase the survey completion rate.

While this sampling plan has good strategic intentions, never-the-less three factors may influence the response rates.

1) The invitation to take the survey, being approached and asked to partake in one.
2) The effectiveness of any incentives to participate
3) Convenience of the responding format (was the survey short, or easy to answer)

Collection of Data

The in-store survey was conducted from 10:00 AM to 1:00 PM at all three MRM locations in Billings, Montana. Three teams composed of two people each worked inside each store, using the "Mall Intercept" method, which is intercepting any customer entering the store and handing out surveys to anyone who would take one. In order to facilitate more customer participation, customers were enticed with candy, and advised that they would be rewarded with a 10% off purchase card, after completion of a survey.

After the surveys were collected, questions and answers were coded utilizing a Likert Type scale, with each question varying from 1-3, 1-5, or 1- 7 responses as required. Coded responses were then entered into SPSS V11.0 software for statistical analysis, and additional analyses were also conducted using Microsoft Excel 2002, necessary for measuring the survey completeness part. Please note the following important point; there were twenty-one main survey questions asked, but some questions had multiple sub-questions, and the combined total of all questions asked were forty-seven.

As this survey required many (47) individual questions to be answered, the potential for errors does exist through respondent fatigue, or indifference. According to the textbook Business Research for Decision Making, the author Duane Davis (Davis 2) compares data collection methods of surveys, and the response rate for personal interviews is considered "good". The methodology used for measuring completeness in this survey is as follows:

80.0% - 100.0% (questions completed) = Completed Interview
50.0% – 80.0% " = Partial Interview
0% - 49.9% " = Break off point

Error Checking

In any survey the potential for coding errors exists, whenever responses need to be entered into any statistical software for analysis. An example of a coding error is; for a yes or no question, where a "1" is entered for every yes response, and a "2" is entered for every no response, if a 6 is transcribed into the database (for a yes/no question response) perhaps due to fatigue, an error in coding then has occurred. In this survey, three factors combined to

increase the potential for coding errors. The first factor is due to the large amount of questions on this survey; here forty-seven questions asked require a lot of keyboard entries, and increase the potential for errors. The second factor arises from the use of Likert scales and Semantic differentiation questions, each with many response options. Here the Likert scale questions varied from 1-3, 1-5, or 1-7 choices to mark, and this increased the error potential, compared to a survey with nothing but simple yes/no responses. The third factor resulted from the collection of completed surveys, as the more surveys collected means more keystrokes to enter the data. For this survey, 47 (questions) multiplied by 130 (completed surveys) requires 6,110 individual responses to be entered. Thus the more data to enter, the greater the chance for errors.

Results

A total of 130 completed surveys were collected from all three Billings area MRM stores. Questionnaires from the Billings "Heights" store accounted for 67% of all responses (88), with the two remaining stores evenly split on the remainder of the surveys. The "Best case" response rate totaled 99% of collected surveys. This is very good when compared across various data collection methods as; mail averages 75%, the telephone 44%, Interactive voice recognition (after telephone contact) 28%, and the Web 13% (Dillman 3).

The acceptable survey breakdown rate is as follows:

57 of the collected surveys were completely **ERROR FREE**	43.8%
73 of the collected surveys had **1 or more questions' un-completed**	56.2%
Totals: **130**	100.0%

Test Method #1: (using all 47 survey questions to check for completeness)

The total "Best case" response rate is found by adding:

105 (Completed Surveys) + 24 (Partial Surveys) = 129/130 or 99%

The initial survey results revealed that, the target customer was a:

- Women (64.3%)
- Between 25-60 years old (74.6%)
- Married (60.6%), with an
- Average household size of 2-3 people (52.4%), and
- Had a formal education of High school graduate or above (92%)

Other significant data obtained from the survey:

- 62.0% of respondents shop at MRM a minimum of 2-3 times per month
- 90.8% of respondents have shopped at MRM within the last six months
- Respondents have also shopped at MRMs competitors, within the last six months

Positive Characteristics of MRM:

- Friendliness, location, atmosphere, and selection were favored in that order over prices.
- 93.8% of respondents would probably or definitely return to this store.
- 98.5% were either satisfied or very satisfied with the variety of merchandise.
- MRM staff rated highly in friendliness, helpfulness, and knowledge
- 76.4% of respondents were greeted upon entering the store
- 88.1% say merchandise is displayed in an appealing manor
- MRM rated very good in; cleanliness, lighting, display signs, aroma, and parking

Negative Characteristics of MRM:

- 23.4% say MRMs prices are either somewhat high or very high, which is also corroborated by the overall average mean, which also verifies this
- 51.3% felt there was nothing unique about MRM when compared to its competitors.
- 21.8% felt there was unique qualities about other thrift stores compared to MRMs

Testing H1

This first hypothesis: H1: Prices alone influence the MRM "Thrift Shop" customer**,** required an examination of data (i.e. regression analysis) between question #3, and #4. Here question #3 asked the respondents to rank five distinct characteristics (location, price, selections, friendliness, atmosphere) of this MRM Bargain Center in order of preference, from least liked, to best liked. Of these five characteristics, when ranked by using the average mean, price ranked the lowest.

3) Rank these characteristics in order of what you like best about this MRM Bargain Center? Use a 5-1 scale in which 5 meaning you "like the best" and a 1 meaning you "like the least".

like least *like best*
1…….. 2 …..…3……..... 4 ……5

	mean
a. *Location*	3.79
b. *Price*	3.52
c. *Selection*	3.56
d. *Friendliness*	3.80
e. *Atmosphere*	3.55

On question #4 regarding the likelihood of respondents returning to this store, 93.8% said that they would probably or definitely return to this store.

4) What is the likelihood that you will return to this store?

	1	2	3	4	5
	Never	*Undecided*	*Maybe*	*Probably*	*Definitely*
mean = 4.65		☹	☹	😐 ☺	☺
130 total responses =	0	0	8	29	93

These two questions (#3b, and #4) were then analyzed using multiple regression with the first hypothesis test involves testing the regression of Y (Likelihood) on X (Price). The test involves determining if the effect of Price on Likelihood is significant. The F-test is used, and at the level of significance of 0.05, the f critical is *about* 3.93 (Table B.3, page 576, upper 5% points). If calculated F is greater than F critical, we reject the Null hypothesis and accept the statistical significance of Y (Likelihood) on X (Price) at the 0.05 level of significance. Since our calculated F is .557 (see Regression chart 1) and because .557 < 3.93, one would conclude that Price does not affect the Likelihood of returning to the store, and we accept the Null hypothesis.

The second test involves the significance of R square. This time using alpha = 0.01, the critical F is *about* 6.87 (Table B.3, page 582, upper 1% points). The calculated F is still .557. Because .557< 6.87, here one again can conclude that R square is not significant at alpha = 0.01 either.

The third test involves the significance of b, the regression coefficient. Like all statistics, the regression coefficient has a standard of error associated with it. The t-test is used for testing the b in the model. The degrees of freedom equals 96, and at alpha = 0.01, then critical t is *about* 2.620 (Table B.2, Page 574). Since calculated t = .746 < table t 2.620, then one can conclude that the estimated b (Likelihood) is not significantly different from the (Price) parameter b.

The fourth test involves the significance of R squared; here it is calculated at .006, which gives us the percentage of explained variance. By subtracting that number from 1 (1 - .006 = .994), this gives us the percentage of unexplained variance. Since .6% of the total variance accounted for y is attributable to changes in X, we have a 99.4% unaccounted error variance. As r squared becomes larger (with bounds 0 to 1), it is assumed that Y can be predicted more accurately from the data. In this case, 99.4% of unexplained variance is meaningful large.

Thus after performing these four tests between questions 3b and question 4, we can safely say that we accept the Null hypothesis, meaning that: prices alone do not influence the customers' likelihood to return to the store.

Use for H1: Regression (chart 1) of Q #3b (price) with Q #4 (likelihood of returning)

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	Price ranking(a)	.	Enter

a All requested variables entered.
b Dependent Variable: Likelihood of returning to this store.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.076(a)	.006	-.005	.579	.006	.557	1	96	.457

a Predictors: (Constant), Price ranking

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.187	1	.187	.557	.457(a)
	Residual	32.231	96	.336		
	Total	32.418	97			

a Predictors: (Constant), Price ranking
b Dependent Variable: Likelihood of returning to this store.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.596	.156		29.428	.000	4.286	4.906
	Price ranking	.031	.041	.076	.746	.457	-.051	.112

a Dependent Variable: Likelihood of returning to this store.

Testing H2

H2: Customer service is more important than merchandise diversity, to the MRM "Thrift Shop" customer

On question number 5, 98.4% of respondents were either Satisfied or very satisfied with the variety of merchandise offered by MRM.

5) Were you satisfied with the variety of merchandise?

	1	2	3
	Not Satisfied	*Satisfied*	*Very Satisfied*
mean = 2.32	☹	☺	☺
Total responses 130 =	2	85	43

On question number 6b, 125 respondents rated MRMs staff a mean average of 6.07 out of 7 (being helpful).

6b) How would you rate the helpfulness of the MRM staff? Place an X on the line for the appropriate position rating the MRM staff?

mean = 6.07 *Not helpful* --: --: --: --: --: --: -- *Helpful*
Total responses 125 1……..…….7

After analyzing these two questions utilizing multiple regression, we get;

The first hypothesis test involves testing the regression of Y (Satisfaction) on X (Helpfulness). The test involves determining if the effect of Satisfaction on Helpfulness is significant. The F-test is used, and at the level of significance of 0.05, the f critical is *about* 3.91 (Table B.3, page 576, upper 5% points). If calculated F is greater than F critical, we reject the Null hypothesis and accept the statistical significance of Y (Satisfaction) on X (Helpfulness) at the 0.05 level of significance. Since our calculated F is 8.348 (see Regression chart 2) and because 8.348 > 3.91, one would conclude that customer service is more important than merchandise diversity, and accept the statistical significance of Y (Satisfaction) on X (Helpfulness)at the 0.05 level of significance.

The second test involves the significance of R square. At alpha = 0.01, the critical F is *about* 6.84 (Table B.3, page 582, upper 1% points). The calculated F is still 8.348, and because 8.348 > 6.87, here one again can conclude that R square is significant at alpha = 0.01.

The third test involves the significance of b, the regression coefficient. Like all statistics, the regression coefficient has a standard of error associated with it. The t-test is used for testing the b in the model. The degrees of freedom equals 123, and at alpha = 0.01, then critical t is *about* 2.616 (Table B.2, Page 574). Since calculated t = 2.889 > table t 2.616, then one can conclude that the estimated b (Satisfaction with variety) is significantly different from the (Helpfulness of staff) parameter b.

The fourth test involves the significance of R squared; here it is calculated at .064, which gives us the percentage of explained variance. By subtracting that number from 1 (1 - .064 = .936), this gives us the percentage of unexplained variance. Since 6.4% of the total variance accounted for y is attributable to changes in X, we have a 93.6%

unaccounted error variance. As r squared becomes larger (with bounds 0 to 1), it is assumed that Y can be predicted more accurately from the data. In this business case, 93.6% of unexplained variance is meaningful large.

Thus after performing these four tests between questions 6b and question 5, we can safely say that we reject the Null hypothesis, meaning that: customer service is more important than merchandise diversity.

Use for H2: Regression (chart 2) of Q #5 (Satisfaction with variety) with Q # 6b (Helpfulness of staff)

Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	MRM staff "helpfulness" rating.(a)	.	Enter

a All requested variables entered.
b Dependent Variable: Satisfaction with variety of merchandise.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.251(a)	.063	.055	.537	.063	8.269	1	123	.005

a Predictors: (Constant), MRM staff "helpfulness" rating.

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.387	1	2.387	8.269	.005(a)
	Residual	35.501	123	.289		
	Total	37.888	124			

a Predictors: (Constant), MRM staff "helpfulness" rating.
b Dependent Variable: Satisfaction with variety of merchandise.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.645	.245		6.714	.000	1.160	2.130
	MRM staff "helpfulness" rating.	.114	.040	.251	2.876	.005	.035	.192

a Dependent Variable: Satisfaction with variety of merchandise.

Summary

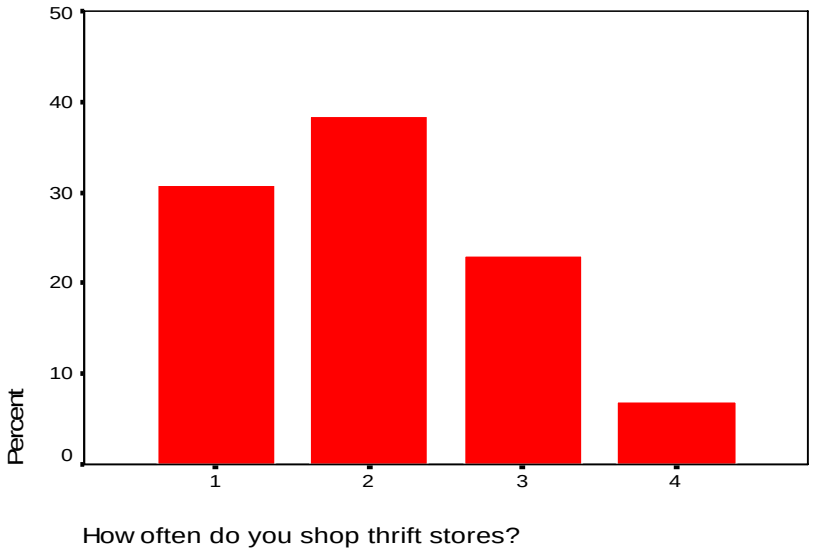
The principle findings of this survey reject the first hypothesis, as after performing four various test of significance between questions 3b and question 4; we can safely say that we accept the Null hypothesis, meaning that: prices alone do not influence the customers' likelihood to return to the store.

The second question of importance pertained to hypothesis number two, after performing four tests of significance between questions 6b and question 5; we can safely say that we reject the Null hypothesis, meaning that: customer service is more important than merchandise diversity.

Also from this 47 question survey, important demographic and customer information such as preferences, frequency of visits, and attitudes, will allow an initial step into planning any marketing strategies. Thus the overall goal of improving the customers shopping experience can now be formulated, by examining those areas that need to be improved, as identified in the collected data.

This research has attempted to understand the most important needs and wants of Thrift store shoppers. From our statistical analysis results, it is apparent that customer service is more important than merchandise variety, and prices alone do not have a big of impact on customers return rate as one would believe.

Another good aspect of this survey is; it is a good initial attempt at finding primary data, for a business that is on a shoe string budget. As MRM had little previous consumer information to act on, it now has a good basic understanding of some of its customer's needs and wants. For example in question #1, 62.1% of respondents were good repeat shoppers (defined as; shopping greater than 1-2 times a week, or 2-3 times a month).



1. Once a month or less. 40 = 31.0%
2. Two-three times a month. 50 = 38.8 38.8%
3. One-two times a week. 30 = 23.3 + 23.3
4. More than three times a week. 9 = 7.0 62.1% (repeat shoppers)

Total responses 129

Also, in question # 2, it is shown that a high number of customers who shop at MRM Bargain Centers also shop at MRMs competitors (Goodwill 68.5%, and St. Vincent 60.0%).

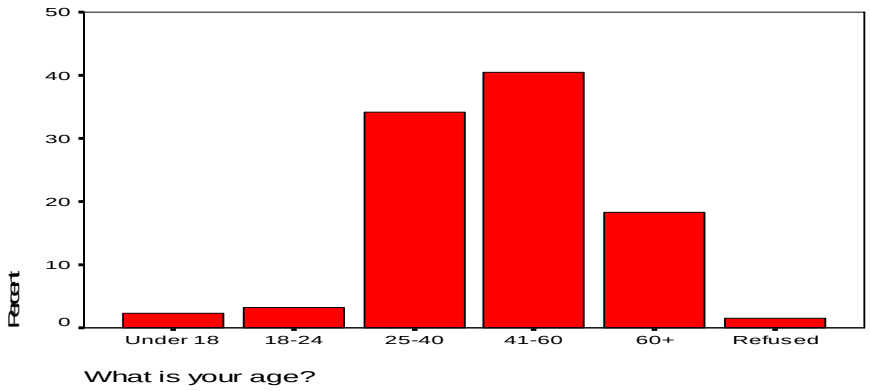
2) Which of these following thrift stores have you visited in the past 6 months? Check all that apply.

a.. MRM Bargain Centers 118 = 90.8%
b.. Goodwill 89 = 68.5
c. St. Vincent de Paul 78 = 60.0
d. The Wise Penny 21 = 16.2
e. The Nearly New Shoppe 19 = 14.6
f. None 0 = 0

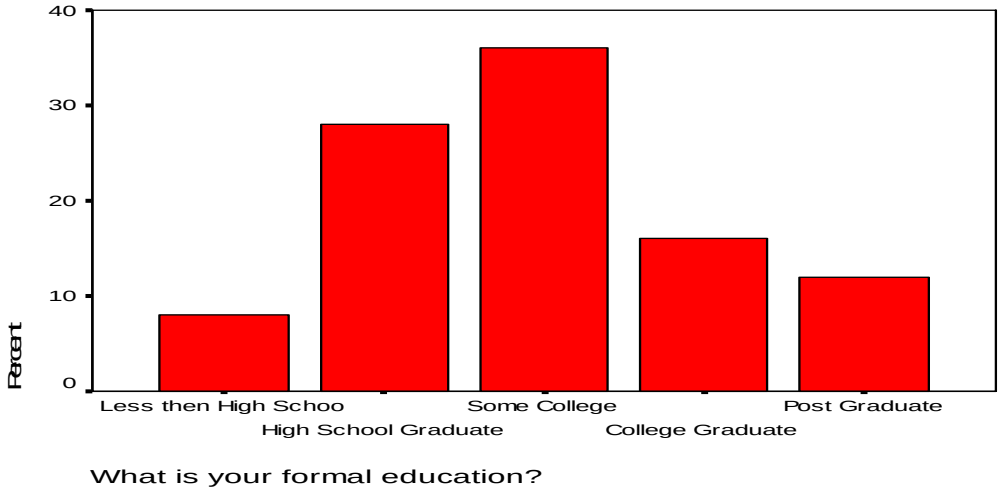
Total surveys collected 130

It is from information discovered by initial surveys such as this one, even though the sample size is small, that little nuggets of gold (useful data) can be mined from the available information, if one looks for it.

Another important yield of the consumer information gained from this survey, concerned the customer demographics. Here 74% of respondents were from 25-60 years old,



and the majority of surveyees had a high school or greater education background.



It is from basic information like this, that MRM can tailor their marketing strategies to meet consumers' needs and wants.

Conclusion and Recommendations for Future Research

While this survey was a good initial step onto the information superhighway, problems from sample size, and survey question construction must be addressed. There are three recommendations that can be made, to provide a meatier sustenance.

The first recommendation arises from the small sample sizes collected from all three stores. Here one store (Billing's "Heights") had a significant impact upon the total collected surveys amount. One possible explanation for their above average totals could be that; the Billing's "Heights" store is in a prime location and attracts more customers, thereby yielding more chances at completed surveys.

Another problem area was the small yields of completed surveys from the other two stores. This is verified in the collection of the in-store surveys, where only twenty-two of the total surveys were obtained from the downtown store, and only twenty were collected at the West end store. Two possible reasons for the low response rates were; there is a possible location and negative stigma attached to the downtown MRM store, and thus not as many customers are willing to go down there. Also location again may have had an impact on the west end store, as it is physically challenging to turn into the store parking lot, from one of the directions.

Therefore to improve validity, sample size should be increased at all stores. In addition, more emphasis must be placed on collecting an equal amount of surveys from all different stores, necessary for a true random population sample of thrift store customers. With these changes, all three stores can then be properly compared for results.

The second recommendation for improvement arises from the excessive length of this survey. While there was only twenty-one main questions, each question had several sub questions, bringing the overall total of questions to forty-seven. This was too many for the "Mall Intercept" method that was utilized. The recommendation to correct this is to; shorten the survey through a combination of rewording, and eliminating un-needed questions. Non-sampling errors are those caused by faulty coding, untruthful responses, and respondent fatigue, and there is also the need to carefully place the questions in the proper sequence, thereby eliminating any possible cognitive dissonance mistakes providing biased answers.

The last area of improvement concerned the initial survey of all Billings area thrift stores. Here the surveyors may each have had a difference of opinion (pre-judgment), when doing their walk-through. As this walk through relied on our own judgments of thrift stores, there is the need for a precise written evaluation form, necessary to eliminate our own unforeseen (hidden) biases.

Two areas for further research begin with the need to conducted surveys at other competitor's thrift stores, and this will enable a good cross sectional representation of the average "Thrift store" shopper. Another recommendation is to do a survey that compares the "Thrift store" shoppers' behaviors, to the Retail stores shoppers. Here any differences must be discovered, before proven "Retail" marketing techniques can be utilized for thrift stores applications.

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Are Derivatives Really That Dangerous?

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Abstract

Billionaire investor Warren Buffet has commented that derivatives are "time bombs" and "financial weapons of mass destruction." Are derivatives really that dangerous? On the other hand, former Federal Reserve Chairman Alan Greenspan has repeatedly said that the benefits of derivatives have materially exceeded the costs. This paper attempts to sort out the issues surrounding this controversy and concludes that even though disastrous consequences can be caused by the improper uses of derivatives, they are actually effective risk management tool and very beneficial to the economy.

Are Derivatives Really That Dangerous?

Introduction

At the 2004 annual shareholder meeting of Berkshire Hathaway, billionaire investor Warren Buffet warned that "sometime in the next ten years you will have a huge problem that will either be caused by or accentuated by people's activities in derivatives." In his annual letter to the shareholders in 2003, he also commented that derivatives were "time bombs" and "financial weapons of mass destruction." Are derivatives really that dangerous? On the other hand, former Federal Reserve Chairman Alan Greenspan has repeatedly said that the benefits of derivatives have materially exceeded the costs. This paper attempts to sort out the issues surrounding this controversy and concludes that even though disastrous consequences can be caused by the improper uses of derivatives, they are actually effective risk management tool and very beneficial to the economy.

What Are Derivatives?

A derivative is a contract whose value derives from the value of an underlying item. The underlying item can include commodities, exchange rates, interest rates and securities. Derivatives often do

not involve the transfer of titles; rather they create pure price exposure by linking their value to a principal amount of the underlying item.

Despite the complexity of some derivative instruments, most derivatives can be constructed from two simple and fundamental building blocks: forwards and options. A forward contract obligates one party to buy and the other to sell a specific quantity of an item at a specified price at a specified time in the future. For example, a commodity forward may involve party A buying (and party B selling) 10,000 barrels of crude oil at $70 per barrel on June 30, 2006. In contrast, an option contract gives its holder the right, but not the obligation, to buy or sell a specific quantity of an item at a specified price in the future (an "American" option can be exercised on or before the expiration date, whereas a "European" option can be exercised only on the expiration date). In acquiring for this right, the buyer (i.e., the holder) pays the seller or writer of the option a nonrefundable fee called a premium. The most an option buyer can lose is the premium paid for the option. For other derivatives, contract parties (including option sellers) can have much larger possible losses that can sometimes be theoretically unbounded. Other popular derivatives instruments include futures and swaps. Futures contracts are like forwards, but they are standardized and publicly traded on organized exchanges. A swap is a contract in which the counterparties agree to exchange payments over the life of the contract. Each payment is calculated by applying some price or rate to a principal amount. A swap is essentially just a series of forward contracts.

Benefits of Derivatives

The main benefit of derivatives is risk reduction. Derivatives allow users to efficiently hedge their exposures to risk from price, interest rate and exchange rate fluctuations. For example, the airline can buy gasoline forwards to hedge its exposure to surging fuel prices so that if gasoline price should surge, the rise in the airline's fuel costs will be offset by the gains on its forward position. When companies can hedge risk better, they can take on riskier but more profitable projects by hedging those unwanted risks. As a result, productivity and standards of living are improved.

A second benefit from the use of derivatives is that companies can have lower funding costs and more diversified funding sources. With currency and interest rate swaps, companies are able to borrow in the capital market with the lowest cost without regard to the currency in which the loan is denominated or the form in which interest is paid (fixed or floating).

Furthermore, derivatives can make the underlying markets more efficient. Derivatives enable investors to trade on information that otherwise may be expensive or difficult to execute. For example, short selling can sometimes be difficult to implement and this slows down the speed of the incorporation of adverse information in prices. With a put option (the option that enables its holder to sell an item at a predetermined price), an investor can more easily take advantage of adverse information and this makes the market more efficient.

Derivatives Markets

Derivatives have been traded for centuries. Options on tulip bulbs were traded in Holland in the seventeen century. But the derivatives markets were small until the 1970s, when the sudden increases in the volatility of exchange rates and interest rates made it imperative for companies to manage these risks.

The size of the over-the-counter (OTC) derivatives markets is much larger than that of the exchange-traded derivatives markets as OTC derivatives can be tailored to fit the desires of the counterparties. According to the Bank for International Settlements (BIS) survey of major derivatives dealers in the world, the notional amount of outstanding OTC derivatives was $270 trillion in June 2005, with interest rate swaps accounted for about 61 percent of the market. The notional amount is the face value of the principal amount of the underlyings on which derivatives instruments are based. For example, the crude oil forward contract discussed earlier has a notional amount of $700,000 ($70 per barrel × 10,000 barrels). Derivatives markets have expanded rapidly in recent years. According to an earlier BIS survey, the notional amount of outstanding OTC derivatives was $94 trillion in June 2000, which implies that the worldwide OTC derivatives market had been growing at the rate of over 23 percent per year for the last five years. The notional amount of exchange-traded derivatives in the world was $58.3 trillion in September 2005, with option contracts accounted for 64% of the market and futures contracts accounted for the remaining 36% of the market. As its notional amount was $23.9 trillion in December 2002, the worldwide exchange-traded derivatives market increased by more than 140 percent from 2002 to 2005.

Notional amount is useful as a measure of the relative importance of different types of derivatives and as a measure of the growth of derivatives activities. However, notional amount can be a misleading indicator of the size of derivatives transactions because it is just the reference amount for calculating the payments of the contracts. Therefore, cash flows arising from derivatives transactions are usually much

smaller than their notional amounts. An alternative way to look at the size of the derivatives markets is to add up the positive market value of all the contracts. According to the BIS, it was $10.7 trillion in June 2005 and it was $1.9 trillion after taking into account legally enforceable netting agreements.

Use of Derivatives

According to the International Swaps and Derivatives Association (ISDA) report in 2003, 92 percent of the world's 500 largest companies use derivatives. Of the companies using derivatives, 92 percent use derivatives to help manage interest rate risk, 85 percent to help manage currency risk, 25 percent to help manage commodity price risk, and 12 percent to help manage equity price risk.

In a survey of U.S. non-financial firms by Bodnar, Hayt and Marston (1998), 200 of the 399 responding firms use derivatives. In terms of firm size, usage is highest among large firms at 83 percent. Usage rate drops to 45 percent for medium-sized firms and to 12 percent for small firms. Of the firms that do not use derivatives, 60 percent of them state that their exposures are too small. Other reasons given for not using derivatives include that exposures can be managed effectively by other means, costs of hedging exceed the expected benefits, and there are concerns about the perceptions of the use of derivatives by investors and analysts.

Banks are the major dealers in the derivatives markets. The Office of the Comptroller of the Currency reported that in the third quarter of 2005, 805 commercial banks in the U.S. held derivatives. The notional amount of derivatives in these bank holdings was $98.8 trillion. These banks held 97 percent of the derivatives for trading purposes and 3 percent for risk management needs. OTC and exchange-traded derivatives comprised 91 percent and 9 percent, respectively, of the bank derivative holdings. Interest rate and currency contracts accounted for 84 percent and 9 percent, respectively, of the bank derivatives. Holdings of derivatives were concentrated in the largest banks. Five banks (JPMorgan Chase, Bank of America, Citibank, Wachovia, and HSBC) held more than 96 percent of the derivatives in the U.S. commercial banking system, with 48 percent of them held by the number one player, JPMorgan Chase.

Accounting for Derivatives

Financial Accounting Standards Board issued Statement of Financial Accounting Standards No. 133 (SFAS 133) in 1998 to address the accounting and reporting for derivatives. SFAS 133 requires that all derivatives be shown at fair value on the balance sheet as either assets or liabilities. Prior to that,

derivatives were reported on a variety of bases (such as historical cost, forward value, fair value) or not reported at all. Changes in fair value of a derivative not qualified as a hedge are to be reported in current earnings. For a derivative that qualified as a hedge, hedge accounting will apply. Hedge accounting is a special accounting treatment that essentially matches the earnings effect resulting from the changes in fair value of a derivative with the earnings effects of the item being hedged. However, the portion of the changes in fair value of the derivative due to ineffective hedging is reported in earnings in the period incurred. Proper documentation and frequent assessment of the effectiveness of the hedging relationships are required.

In an attempt to smooth earnings, companies had applied hedge accounting to avoid reporting the changes in fair value of their derivatives positions in earnings even when the requirements for hedge accounting were not met. Over the last three years, top executives at both Fannie Mae and Freddie Mac (the two federal government sponsored mortgage corporations) had been forced to resign because of their improper use of hedge accounting. Both of these two companies had to restate their earnings by at least several billion dollars.

Risks of Derivatives

Risks of derivatives stems from a variety of sources. There are valuation risk, market risk, operating risk, credit risk, legal risk, and systemic risk.

Valuation risk is the risk that a derivative is misvalued. Valuation is not an issue when the derivative is traded in a liquid market so that it can always be bought or sold at the market price. However, when liquid market does not exist, which is the case for most OTC derivatives, models have to be used to value derivatives. For complex or long maturity derivatives, minor changes in the value of the parameters used can render substantial fluctuations in the value estimate of the derivatives.

Market risk is the risk that the value of a derivative will change when market conditions change. For example, when the level of interest rates rises, the value of an interest rate swap declines for a counterparty that receives fixed rate and pays floating rate on the swap. The relevant exposure is the unhedged portion of a derivative portfolio. A particular type of market risk is market liquidity risk, which is the risk that sudden and sharp price movement makes it difficult to close out an unwanted derivatives position promptly at a fair price.

Operating risk is the risk of loss as a result of inadequate risk management and internal controls. Entering into derivatives transactions without adequate systems for measuring, monitoring, and controlling risks can result in significant losses.

Credit risk is the risk that a loss will be incurred because the counterparty fails to make the payments due. It is of less concern for exchange-traded derivatives since their credit exposure is to the exchange clearinghouse rather than to an individual counterparty, which is the case for OTC derivatives. A particular type of credit risk is settlement risk, which is the risk of default during the period when one counterparty has fulfilled its obligation under the contract and waits for the delivery of assets or securities from the other counterparty. Settlement risk does not exist when only netted payment is made.

Legal risk is the risk of loss because a derivatives contract cannot be enforced. Derivatives markets span countries all over the world. Each country has different bankruptcy and securities laws. Concerns include whether the counterparty is authorized to enter into a derivatives transaction and how derivatives are handled in a bankruptcy proceeding.

Systemic risk is the risk that a failure at one company causes widespread difficulties throughout the financial system. The derivatives markets' global scope and interconnections have raised concerns about the possibility of systemic financial crisis.

Derivatives Disasters

Derivatives cannot cause anything. It is the misuse of derivatives that cause these so-called "derivatives disasters" to happen. The source of the problem is how the market participants use derivatives. In the following, several of these disasters will be examined to illustrate that they were caused by mainly uncontrolled speculation.

In 1994, Procter and Gamble (P&G) lost $157 million on derivatives. As discussed in Smith (1997), the contract was effectively an interest rate swap with an embedded option that was little more than a highly leveraged bet on interest rates. With stable or falling interest rates, P&G would be able to borrow $200 million at below Treasury bill rate. In exchange, it was exposed to the potential extremely large losses in the event of sudden surge in interest rates. Sure enough, interest rates rose sharply in 1994 and P&G suffered large losses. If interest rates had gone down instead of up, P&G would have been just fine. In other

words, P&G placed a huge bet and lost. Similarly, an $1.7 billion loss on interest rate derivatives forced Orange County into bankruptcy the same year.

The bankruptcy of Barings Bank (one of the oldest British banks) in 1995 was a failure due to the lack of internal controls. Nick Leeson was a trader working for Barings in Singapore. He created an "error account," that was apparently never reconciled by others, to artificially generate profit for other accounts. In his attempt to recover the losses in this error account, he took large position in Japanese stock index futures and index options and in the process he lost over $1 billion. It is clear that Barings' management violated the long established and tested internal control principle that operations and accounting for operations should be segregated. In this case, Leeson was allowed to reconcile his own trades and thereby he could conceal his activities from his superiors. Derivatives were just the instruments he used to speculate. Similar story of unaccountability on the trading desk contributed to the $2.6 billion loss at the Japanese firm, Sumitomo, a leading player in the world copper market in 1996.

The collapse of the hedge fund Long-Term Capital Management (LTCM) in 1998 is often cited as an example of the systemic risk posed by derivatives, the possibility of a meltdown of the financial system caused by a crisis in the derivatives market. Like many hedge funds, LTCM tried to profit from the market mispricing of securities. It engaged in derivatives transactions that were equivalent to buying bonds that it believed to have too high a yield given their risk and selling low-yielding bonds such as U.S. Treasuries. Therefore, when the yield spread narrows as expected by LTCM, it would make profits (bond prices and bond yields move in opposite directions). But, as the derivatives markets are generally quite efficient, the mispricing amounts, if any, are quite small. To generate meaningful profits, extremely large purchases and sales of derivatives are needed. Shortly before its collapse, LTCM held derivatives with a total notional amount in excess of $1 trillion. Over 95% of the funds in financing these huge positions were borrowed from banks and securities firms. Even a small unfavorable movement in the market could wipe out its equity. As it turned out, when Russia defaulted on its debt in 1998, there was a stampede to "safety." Investors everywhere tried to unload high-risk bonds and replace them with low-risk bonds. As losses piled up because of the widening yield spread, LTCM tried to liquidate its large holdings to meet margin calls, which put more pressure on prices. This generated further losses for LTCM. As so many banks and securities firms were either LTCM's counterparties in its derivatives contracts or holding securities similar

to those held by LTCM, the collapse of the prices of those securities could possibly lead to a widespread financial crisis. Eventually, LTCM was rescued and taken control by a creditor consortium organized by the Federal Reserve Bank of New York to ensure an orderly liquidation of its huge holdings. The problem with the case of LTCM was the unprecedented amount of borrowed money used for speculation and the carelessness with credit risk of the many of its counterparty financial institutions.

Recommendations

In light of the potential disastrous consequence caused by the misuse of derivatives, companies have to make sure that they use derivatives properly. Those in charge of taking derivatives positions must have the necessary training and experience. The risks (valuation, market, operating, credit, and legal risks) of derivatives positions have to be understood and carefully monitored. Senior management and board of directors need to establish internal controls and audit procedures necessary to monitor the companies' derivatives positions and exposures. They have to understand why and how derivatives are used by the companies and should not allow derivatives transactions that they do not understand. The more complex the transactions, the more due diligence is required to be applied.

Derivatives dealers should inform counterparties, especially those less sophisticated end users, about the specific risks of derivatives in varying market conditions. Regulators have to monitor carefully financial institutions with large derivatives positions to control systemic risk. With the increase in the use of credit derivatives, these financial institutions are now better able to protect themselves from credit risk.

Conclusions

Are derivatives really that dangerous? The answer is no. Derivatives allow companies and individuals to manage risks better by keeping the risks that are wanted and hedging away those that are not wanted. Therefore, derivatives can allow risks to be born by those who are in the best position to bear them. The whole economy will benefit from the proper use of derivatives. Like all power tools, they can become dangerous in the hands of incompetent and/or careless users. Adequate monitoring must be maintained to guard against the out of control use of derivatives.

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THE INCOME TAX INSTRUCTIONS OF STATES IN THE NORTHEAST: A READABILITY STUDY

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Abstract

The taxation of individual income represents an important revenue source for many states. The taxes are determined by a self-assessed tax system from information that is the declaration of the taxpayer in an annual return. State taxation agencies facilitate compliance by furnishing individuals with the necessary forms and instruction materials needed to prepare the self-assessed tax return. This study reports on a readability assessment of the income tax instructions for states in the Northeast. The results indicate an improvement in the readability of instructions between 1990 and 2005, as well as, a finding that by comparison the instructions for states comprising the Northeast are less difficult to read than those of states in other regions of the U.S. except for the West. However, in absolute terms the tax instructions for Northeastern states remain difficult to read. The 2005 tax instructions have a readability level that currently exceeds the educational attainment level for half of the adult population in the Northeast.

One of the most important sources of tax revenue for many state governments is the tax on individual income. Prior to 1920 state income taxation existed in only 12 states according to Penniman (1980), but by 1958, 28 states had established an individual income tax. Today, 41 states impose an individual income tax. The increase in the number of states that have individual income tax laws highlights the significance of this revenue source for government budgets, and accordingly underscores the importance of taxpayer compliance with the laws.

The laws for state income taxation are based on a self-assessment tax reporting system, and it is this system of self-assessment on which the fiscal health of state governments is largely dependent. Revenue in a self-assessed tax system is determined from the information declared by the taxpayer on an annual return. State taxation agencies facilitate taxpayer compliance by furnishing individuals with the necessary forms and instructions booklets needed to prepare the self-assessed tax return. However, the degree of taxpayer compliance with the self-assessment process is in part a function of whether the tax instructions are readable. The purpose of this study is to measure the readability of income tax instructions for states in the Northeast. The study presents individual comparisons of the readability levels between states within the Northeast, and an aggregate comparison of the Northeast region to other regions of the U.S. based on the readability of tax instructions for 2005, along with a longitudinal comparison of the readability for state tax instructions in 1990 and 2005.

The remainder of this paper is organized in four sections as follows, related research, methodology, results, and concluding comments. For this study the delineation of regions (Northeast, Midwest, South and West) corresponds to the classifications of the U.S. Census Bureau. Therefore, the Northeast region includes Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont. However, since the state of New Hampshire only taxes the dividend and interest income of individuals it is excluded from the study.

Related Research

Readability is a prerequisite element for understandability. Assessments of readability are often accomplished through the use of formulas. A formula consists of factors that influence the ease of comprehending a written communication, and as such a formula provides a quantitative approach to the measurement of reading difficulty. Readability has been extensively studied in a number of different disciplines, including accounting. An accounting literature review of readability research by Jones and Shoemaker (1994) identified and compared 32 studies, and included an observation that computer software had been incorporated to facilitate the analysis of data in only 4 of the studies. In years since the study by Jones and Shoemaker (1994), accounting readability research continues but has made increasingly greater use of specialized software, and, in particular, according to Montondon and Marsh (2005) and Reinstein and Houston (2004), the studies rely on the Readability Calculations Plus program developed by Micro Power & Light. Readability Calculations Plus is a Windows/Macintosh based reading assessment program that can be applied to analyze text and indicate the reading level(s) of material using up to nine different readability formulas.

Several of the formulas provided by Readability Calculations Plus are appropriate for an assessment of elementary or secondary school materials, but these formulas would not be suitable for an analysis of tax instruction readability. Therefore, in Readability Calculations Plus the two most relevant formulas for determining the readability of income tax material intended for adults are the Fog Index and the Flesch Reading Ease Score. The Fog Index is suited for assessments of business publications and is widely used in the health care and insurance industries. The Fog Index number represents a grade level for reading. For example, a Fog of 16 indicates that a reader would need a baccalaureate college degree to comprehend the material (see Exhibit 1). When preparing adult text material on the basis of Fog it is generally recommended that a technical publication should not score higher than 14, nor should a general business publication score higher than 12. The Flesch Reading Ease formula is designed to assess adult materials and shows scores on a scale between 100 and 0 as representation for very easy to very difficult to read (see Exhibit 1). It is generally regarded that a Flesch score of 65 corresponds with a 'Plain English' style of writing.

An abundance of readability research in various areas of accounting has been published, but rarely has the research concerned the readability of tax instruction materials. A study by Urbancic (1993) reports the results of an analysis of state tax instruction readability for individual income taxes based on a comparison of the 1990 instruction booklets used by Northeastern states. The study incorporates a manual application of the Fog Index and Flesch Reading Ease formulas. Based on the results, Urbancic (1993) observed that the readability of individual tax instruction materials ranged from difficult to very difficult, and that the reading difficulty for taxpayers had the potential to unfavorably impact compliance with state tax laws in the Northeast. More than a decade has passed since the analysis of 1990 instructions by Urbancic (1993) and changes in state income tax laws have likely occurred since then. The corresponding revisions to the instruction booklets as result of changes in the tax laws would render previously reported assessments of readability out of date. Therefore, the purpose of the current study as presented within this article is to expand upon the work of Urbancic (1993) by providing an assessment measure for the readability of tax instructions used by states in the Northeast for 2005. The current study presents individual comparisons of the readability levels between states within the Northeast, and an aggregate comparison of the Northeast region to other regions of the U.S. based on the readability of tax instructions for 2005. The study also provides a longitudinal comparison of the readability measurements for state income tax instructions used in 1990 and 2005.

Methodology

Readability assessments made in this study are based on the Fog Index and Flesch Reading Ease formula. Both of these measurement methods are suited to an assessment of text materials that are intended for adults to read, such as income tax instruction booklets. The Fog Index is based on average sentence length, in terms of the number of words per sentence, and the percentage of polysyllabic words (i.e. words having three or more syllables) as follows: Fog Index = .40 X sentence length + percentage of polysyllabic words. The Fog Index, so determined, represents the approximate educational level required for comprehension of the material tested. The educational level corresponds to material about which people at that level can give nine out of ten correct answers on questions from the tested material. The Flesch formula is based on a combination of average sentence length and word length (i.e. the average number of

syllables per word). These factors are used in a formula to determine a score for readability as follows: Reading Ease = 206.835 - .846 word length – 1.015 sentence length). Scales for interpreting the readability scores for the study are presented in Exhibit 1.

Data for the study consists of the 2005 individual income tax instructions which were obtained for each state in PDF file format. Three test samples of text instructions (excluding forms, schedules, charts and tables) were analyzed for each state and reported results are based on averages for the samples. All of the readability measurements were made by processing the data with Readability Calculations Plus software in order to determine the Fog Index and the Flesch Reading Ease scores by state.

Results

Assessments of the readability of income tax instructions based on the Fog Index are presented in Exhibit 2. As discussed in the section on methodology, the Fog Index represents the educational level required for comprehension of the material tested. Therefore, to provide a framework for comparison of the Fog scores, Exhibit 2 includes information about the actual education attainment levels for adults in the U.S. as reported by the Census Bureau (2003). Pennsylvania has the most readable income tax instructions among states in the Northeast, and its Fog grade level of 10.8 compares favorably to the education attainment level of the adult population in Pennsylvania since 81.9 percent of those aged 25 years and over have a high school diploma. Most adults residing in Pennsylvania should be capable of reading income tax booklets with a reasonable understanding of the instructions. By contrast, the instructions for Connecticut are the least readable and its high Fog grade level of 19.5 does not compare favorably to the education attainment level of the adult population in Connecticut since only 13.3 percent of those aged 25 years have a graduate degree. Overall, six of the states listed in Exhibit 2 have scores of 13.9 or less and the instructions for these states should be readable by at least half the adult population since the Census Bureau reports that 50.9 percent of adults in the Northeast have at least attended a college, including those who went on to complete a degree.

Readability assessments of income tax instructions based on the Flesch Reading Ease Formula are presented in Exhibit 3. Similar to the Fog results, the exhibit indicates that the instructions for Connecticut are rated the most difficult as indicated by a Flesch score of 30.0. The most readable instructions among

states in the Northeast are those of Rhode Island (66.7), New York (65.3) and Pennsylvania (58.7). However, the Flesch readability scores reported in Exhibit 3 taken jointly indicate that state income tax instruction booklets are generally difficult to read. In other words, the analysis is not a matter of whether or not the instructions are difficult to read, but rather a matter of the level or degree of difficulty encountered by a reader of the instructions.

It is acknowledged on the basis of the preceding results that state income tax instructions are difficult to read, but has there been progress in reducing the degree of difficulty? Exhibit 4 provides a longitudinal comparison of the readability scores for 2005 and 1990 for states in the Northeast. The Fog and Flesch scores for 1990 are from the earlier study by Urbancic (1993). Based on the results in Exhibit 4 improvements in readability have been achieved by a majority of the states in the Northeast. In terms of the Fog Index, five states have better readability scores in 2005 compared to 1990, including New Jersey, New York, Pennsylvania, Rhode Island and Vermont. Improvements are more extensive based on results for the Flesch Reading Ease formula as all states except for Connecticut have reduced levels of reading difficulty for income tax instructions. The results for the Northeast region indicate improvement by more than a full grade for the Fog Index from 15.9 in 1990 to 14.3 in 2005, and by one level for Flesch from 36.6 (difficult) in 1990 to 52.4 (fairly difficult) in 2005. These readability improvements have been accomplished through the efforts of state tax agencies to annually revise the instructions. Numerous revisions have occurred in the years since 1990, and though many revisions are written to reflect new tax laws, other revisions are implemented for the purpose of improved readability and reflect the general legislative movement toward 'Plain English' at both the state and federal levels of government in the United States. According to Giles and Still (2005) government agencies as diverse as those responsible for the nation's defense and those responsible for the nation's health require that materials for which these offices must assume responsibility adhere to a measure of readability according to a scale that assigns a reading grade level.

Exhibit 5 provides a comparison of the readability scores of income tax instructions for states in the Northeast with the averages for states in each of the other three U.S. regions as defined by the Census Bureau. According to the results presented in Exhibit 5 the readability scores of the Northeast region (14.3 Fog and 52.4 Flesch) are second to only the scores for the states comprising the West region (13.9 and

53.5). Compared to the Northeastern states the levels of reading difficulty are greater for the income tax instructions of states comprising the Midwest (15.3 and 49.6) and South (15.0 and 46.9) regions.

Concluding Comments

This study reports on a readability assessment for individual income tax instructions among states in the Northeast. The results indicate an improvement in the readability of instructions between 1990 and 2005, as well as, a finding that by comparison the instructions for states comprising the Northeast are less difficult to read than those of states in other regions of the U.S. except for the West. However, in absolute terms the tax instructions for Northeastern states remain difficult to read. The 2005 tax instructions have a readability grade level of 14.3, whereas the Census Bureau (2003) reports that half of the adult population in the Northeast has never attended college. This remains a significant problem since tax instruction materials are primarily intended for use by the general population that earns income under each state's jurisdiction. The difficulty encountered in attempting to understand tax instructions places many taxpayers at risk of penalties for making errors in their self-assessed returns, or may compel them to incur a fee and obtain professional assistance in preparing the return. This fee in effect becomes a further cost added to the tax burden itself, and unfairly targets a segment of the adult population based on education.

Providing the taxpayer with the necessary information to correctly determine individual income tax is the responsibility of state tax agencies. Since the instructions bear in part on issues of enforcement and taxpayer compliance, tax agencies have an incentive to develop instructions which are appropriate to the reading skills of the taxpayer. Toward meeting this responsibility, tax agencies should minimize the use of technical words, specialized terms and lengthy sentences. This can be done by replacing long, unfamiliar words with equivalent terms that are more conventional. Also, when technical terms are necessary, they should be accompanied by adequate explanations. State income taxation laws are based on a self-assessment reporting process. For this reason it is the responsibility of state tax agencies to make concerted efforts toward writing instructions that are more readable. Such efforts can improve tax return accuracy and thereby enhance the amount of revenue generated for states by income taxes. Also, the amount of state resource expenditures necessitated for agency follow-up procedures owing to taxpayer errors can be reduced.

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Exhibit 1
Scales for the Interpretation of Readability Scores

Fog Index

Readability Scores	Equivalent Education Level
17	College, graduate
16	College senior
15	College junior
14	College sophomore
13	College freshman
12	12th grade
11	11th grade
10	10th grade
9	9th grade
8	8th grade
7	7th grade
6	6th grade

Flesch

Readability Scores	Description of Readability
0 to 30	Very difficult
30 to 50	Difficult
50 to 60	Fairly difficult
60 to 70	Standard
70 to 80	Fairly easy
80 to 90	Easy
90 to 100	Very easy

Exhibit 2

A Comparison of Educational Attainment and the Readability
of State Income Tax Instructions

State	Fog Readability Score	Percentage of the Population Aged 25 Years and Over Per U. S. Census: Graduate Degree	Bachelor's Degree	Some College	High School Diploma	Less Than High School Diploma
Connecticut	19.5	13.3	18.1	24.1	28.5	16.0
Maine	13.9	7.9	15.0	26.3	36.2	14.6
Massachusetts	15.7	13.7	19.5	24.3	27.3	15.2
New Jersey	16.8	11.0	18.8	22.9	29.4	17.9
New York	12.8	11.8	15.6	23.9	27.8	20.9
Pennsylvania	10.8	8.4	14.0	21.4	38.1	18.1
Rhode Island	12.3	9.7	15.9	24.6	27.8	22.0
Vermont	12.5	11.1	18.3	24.7	32.3	13.6

Exhibit 3

Readability Assessments of Income Tax Instructions for States in the Northeast

State	Flesch	Description of Readability
Connecticut	30.0	Very difficult
Maine	58.0	Fairly difficult
Massachusetts	41.0	Difficult
New Jersey	43.7	Difficult
New York	65.3	Standard
Pennsylvania	58.7	Fairly difficult
Rhode Island	66.7	Standard
Vermont	55.7	Fairly difficult

Exhibit 4

A Longitudinal Comparison of the Readability of
Income Tax Instructions for States in the Northeast

State	Fog		Flesch	
	2005	1990	2005	1990
Connecticut	19.5	14.6	30.0	41.9
Maine	13.9	12.0	58.0	48.3
Massachusetts	15.7	13.2	41.0	35.8
New Jersey	16.8	18.1	43.7	29.6
New York	12.8	16.6	65.3	47.4
Pennsylvania	10.8	17.9	58.7	29.6
Rhode Island	12.3	19.8	66.7	18.8
Vermont	12.5	14.8	55.7	41.2
Average	14.3	15.9	52.4	36.6

Exhibit 5

A Comparison of the Readability of
State Income Tax Instructions by Regions

Region	Fog	Flesch
Northeast	14.3	52.4
Midwest	15.3	49.6
South	15.0	46.9
West	13.9	53.5