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ECONOMIC CONSEQUENCES OF INTERNET FINANCIAL REPORTING**

ABSTRACT

The paper considers two major economic effects created by the Internet for financial accounting and disclosure. First, the Internet changes the costs of information processes and with it the demand and supply of financial information in capital markets. Second, Internet financial reporting creates a demand for standardization, which has been taken up with the development of XBRL. It is argued that while XBRL is designed to standardize only the format of information, it will also standardize contents. Finally, the paper discusses the issue of assuring high quality Internet financial reporting.

JEL-Classification: M41, O33, G18.

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1 INTRODUCTION

The last ten years or so have seen enormous development of the Internet and an increasing acceptance by its users. Major characteristics of the Internet are that information can be accessed (almost) any time and everywhere, and generally at a low cost; the information is up-to-date; there are few limits on data availability; information can include dynamic presentations and multimedia; and there is the possibility of interactive information demand and supply. These developments have a significant effect on the dissemination of information and on the trading of goods, including shares, and thus on the organizational structures of how these activities are performed. They also open up new and astounding opportunities for financial disclosure that affect all interested parties, notably corporations, investors, auditors, and information intermediaries. These opportunities concern standard setters as well as regulators.

Various studies show that most listed corporations now disclose financial information on their websites, and that the level of disclosure has increased over the last years¹. The Internet has probably become the primary source for users searching for corporate financial reports. Companies invest substantial resources in the

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1 See, e.g., *Lymer* (1999), *Lymer et al.* (1999), and more recently, *Eitredge/Richardson/Scholz* (2002), and *Debreceňy/Gray/Rahman* (2002).

development of their websites, and come up with innovative ways to present financial information.

While the acceptance of Internet disclosure has increased, most of the information provided is still substantially the same that is available from other sources, too. There are many opportunities for this practice to change. Empirical studies suggest a decline in the value of traditional financial reports². Reducing boundaries for generating and disseminating information by Internet technologies may provide the opportunity to change the traditional financial reporting model. For instance, Elliott concludes that "Information technology (IT) is changing everything"³. With the advent of Extensible Business Reporting Language (XBRL) as a standardized data description format for financial reporting, there are many studies that describe this technology and promote the benefits to all preparers and users of financial reports⁴. Quite often, this literature misses potential negative effects that may also exist.

The effects of new information technologies on financial disclosure have been an issue for standard setters and accountants⁵. These studies explore potential future developments not only for disclosure, but also for radical changes of the current financial reporting model. For example, they include forecasts like this: "The annual report of the 21st century will not be annual and it will not be a report: it will be an up to date, informative, permanent dialogue."⁶ However, the ballyhooed future directions remain vague.

Although visionary thoughts on new opportunities none has dreamed of before provide an important impetus for financial reporting developments, it is also clear that technology alone does not drive the demand and supply of financial information. It is the preparers and users whose supply and use of the information defines the type and amount of financial information that is being produced and digested. Standard setters and regulators follow up to see if there is a demand for standardization based on changing demand and supply.

This paper attempts to shift the discussion of the effects of the Internet on financial reporting towards an economic framework. The contribution lies primarily in an analysis of the economic consequences the Internet developments have on financial disclosure. It shows that information technology does not change everything. The principles governing their economic effects remain widely unaffected⁷, that is, financial disclosure is (still) governed by incentives and cost-benefit trade-offs. The paper applies insights from the financial disclosure literature on Internet financial reporting to analyze the potential effects on the demand and supply of financial information. However, I note at the outset that many issues that arise with Internet financial reporting are still in flux, so that the significance of these effects is difficult to ascertain at present.

² See, e.g., *Lev/Zarowin* (1999).

³ *Elliott* (1992), p. 61.

⁴ See, e.g., *Zarowin/Harding* (2000), or more recently *PricewaterhouseCoopers* (2002).

⁵ See, in particular, *FASB* (2000), *Lymer et al.* (1999), *Trites* (1999), *ICAEW* (1998).

⁶ *Alan Benjamin Obe*, as quoted in *ICAEW* (1998), p. 17.

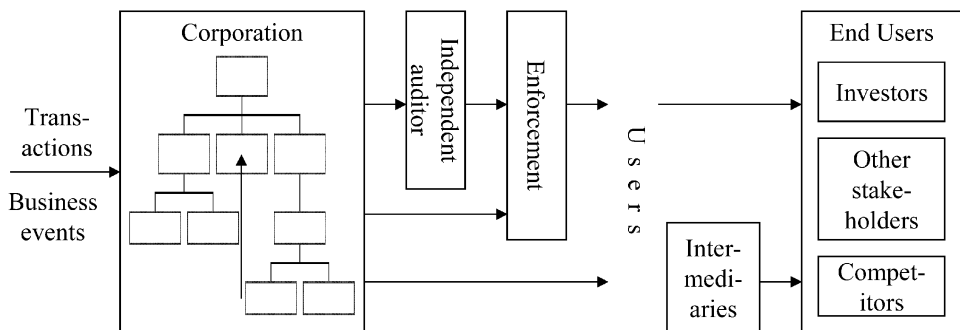
⁷ See also *Shapiro/Varian* (1999), p. 206.

The paper is organized as follows: The next section gives an overview of financial information flows within and outside the firm. Section 3 analyzes the direct cost effects of Internet financial reporting, and what they imply for financial disclosure and for voluntary disclosure incentives by firms. Section 4 considers the increased demand for standardization that comes from the use of the new information technologies. There is a particular focus on XBRL and its effects on financial disclosure and accounting standards. Section 5 looks at issues that arise from the desire to assure a high quality of Internet financial reporting. Section 6 contains a summary and conclusions.

2 ACCOUNTING INFORMATION FLOWS

Figure 1 depicts the typical financial information flows of corporations⁸. Beginning with the recording of transactions and business events in the books of the corporation at various hierarchical levels, a major information flow occurs within the corporation. The information is used for reporting and consolidation purposes of business units. Part of the information within the corporation is condensed by applying accounting standards or regulation into statutory financial statements. The financial statements are audited by an independent auditor and are subject to enforcement by the appropriate national body. Other information, such as interim reports and information published in compliance with continuous reporting requirements are typically not audited or reviewed, but may be subject to enforcement or overview. Some corporate information, e.g., press conference material, is neither audited nor subject to enforcement. The information is then communicated to the users, who are either information intermediaries who use the corporate disclosures and other information to advise end users, or are end users themselves who use the information for their own decision-making.

Figure 1: The process of reviewing credit standing



The Internet affects each of these information flows. The effects are twofold: First, the Internet changes the costs of the information collection, processing, and dissemination. Second, it increases the demand for standardization of information. I

⁸ DiPiazza/Eccles (2002), p. 11, discuss a corporate reporting supply chain which integrates similar elements.

examine each of these two effects separately, although they are to some extent interdependent.

The information cost change affects the cost-benefit trade-off of various processes and instruments. Existing processes will become less expensive, and the costs of new processes may fall below their expected benefit so that they are adopted. The latter effect is why the Internet is often viewed as an enabling technology. It makes available many new possibilities of information gathering, processing, and disseminating to its users that were too costly or even impossible before⁹. However, it does not produce a new demand for information: the demand must already be there. Only the cost of satisfying that demand was too high before the new technology became available.

The Internet is independent of hardware but, nevertheless, requires a common format of the type of data they process. Standardized information is needed to fully exploit the opportunities of the Internet. XBRL provides such a standard for financial reporting. Its development and effects on financial reporting are considered in the subsequent section.

3 EFFECTS OF INFORMATION COST CHANGES

3.1 DIRECT EFFECTS OF COST CHANGES

The Internet offers easy access to firms' financial information. Firms can use this technology to reach more potential users than they can by other communication means. Placing financial disclosures on the Internet offers equal access to all users and reduces the information advantages of some institutional investors relative to others ("democratization of capital markets")¹⁰.

Speed of disclosure is enhanced by Internet disclosure. Disclosure and filing deadlines can become shorter. Information can be published at a time that is under full control by the firm¹¹. To alert users that new information has been put on the Internet, there are several "push" techniques, such as an email notice distributed to identified users. Speed is particularly important for continuous reporting requirements of stock price-relevant information during the financial year. The stewardship function of financial statements is less speed-sensitive, because financial statements are usually led by other disclosures, such as earnings forecasts.

The easy availability of information may induce users to demand more and more information, including assumptions¹², effects of alternative accounting methods,

9 DiPiazza and Eccles mention a cost saving in the production of business reports of up to 60 percent over traditional publishing methods, see *DiPiazza/Eccles* (2002), p. 138.

10 However, *Ordelbeide* (1999), p. 245, argues that the resulting information overflow and the increasing dynamics of the capital markets can create a competitive advantage for professional analysts relative to private investors and thus increase information asymmetry for some time.

11 See, e.g., *DiPiazza/Eccles* (2002), p. 129.

12 Current exposure drafts of revised IASs (e.g., IAS 32, IAS 36) increase the disclosures by requiring disclosure of key assumptions to determine asset values and the sensitivities of changes in the assumptions.

multidimensional properties of information (e.g., probability distributions)¹³, and all sorts of non-financial information. Information about intangibles and value drivers are natural candidates. This increased appetite for information raises the question of how much additional information firms are prepared to disclose. Besides the direct costs of auditing or reviewing such information, firms may be harmed by adverse actions of competitors and other parties that use this information. Moreover, additional disclosure raises legal concerns. In a litigious environment the legal costs can be substantial. If firms are to be motivated to experiment with new technologies and innovative disclosure practices, one way would be to extend safe-harbor rules for contents to Internet disclosures¹⁴. The reluctance of many firms to disclose “too much” is based on these negative effects.

By placing financial information on the firm’s website, users can search, filter, retrieve, download, and even reconfigure such information at low cost in a timely fashion. But Internet financial reporting is not restricted to static texts and graphs. It allows for hyperlinks, search engines, multimedia, and interactivity¹⁵. For example, users may be allowed to customize the contents of financial reports to match their demands or to define user-specific trigger events for reports¹⁶. Even more use of interactivity would be a dialogue reporting by which users could specify information demands based on information they received previously.

Firms can learn from tracking users’ information requests or specific user demands, which users can pose either anonymously or by filling in some kind of access identification. Access statistics are market-driven direct measures of the importance of information, and if interpreted carefully, can guide firms and also standard-setters to react to the demand revealed by the users’ behavior. Software applications offered by a preparer on the Internet could allow firms to learn assumptions investors use in analyzing financial data.

The Internet may also improve the availability of financial information within firms themselves. For example, many of the processes that occur in distant places can be automated and fed into a firm-wide information system. Reporting and consolidation is improved and speeded up (“fast close”). One opportunity is to increase reporting frequency from annual or quarterly to monthly, weekly, daily, or even (almost) instant financial statements¹⁷. The Internet is a prerequisite for high-frequency reporting, as the information should be provided immediately after the announcement release and will lose value fast if delivered to users too late relative to the length of the period it covers. A consequence of more frequent reporting could be that the users’ focus on quarterly earnings may vanish, and with it the incentives of firms to manage them. However, it would require a major change in most accounting systems because events, such as updates of market prices, esti-

13 See, e.g., *Wallman* (1996), pp. 144–146, *Pellens/Fülbier/Gassen* (1998), pp. 66–67.

14 This suggestion is in the spirit of a recommendation by the *Garten Task Force* (2001), pp. 9–10, for more disclosure in general.

15 For a survey of firms usage of such opportunities over 22 countries see *Lymer et al.* (1999), pp. 51–56.

16 See, e.g., *Jensen/Xiao* (2001).

17 The usual example is Cisco Systems which is said to be able to close its books in hours. See, e.g., *Eccles et al.* (2001), p. 309.

mates, and judgments, would need to be entered on a real-time basis as well. Of course, economic questions such as the optimal length of a reporting period emerge, but are not yet well understood.

In economic terms, although the Internet does not affect the objectives of the firm, i.e., maximizing the expected utility of (the representatives of) the firm's owners, it may have a significant effect on the constraints of the maximization problem. Thus, the usual cost-benefit trade-offs apply in deciding how to conduct information processes, only the setting is (generally) expanded due to a relaxation in the constraints. The result is that existing processes may become less costly, newly available alternatives may replace the used processes, or new processes may be adopted due to a favorable cost-benefit ratio. Expanding the feasible set of processes cannot be harmful in a setting if there are no countervailing incentives. That is, the Internet opens up new disclosure opportunities, but the cost-benefit trade-off is relevant whether or not a firm takes up the opportunities.

This discussion assumes that the Internet reduces the direct information costs of firms. However, firms may actually incur higher costs, albeit accompanied by additional benefits of the information source. Cost increases can result from investment in the design and maintenance of a website that includes financial information. Much of the information on the Internet currently complements other information sources. For example, financial reports are both printed as usual and provided via the firm's website, which is costly. This practice is about to change. There are some developments underway to substitute printed material for Internet-disclosed information. For example, in the U.K., if agreed to by a firm's shareholders, the reporting regime can be changed to allow companies to fulfill their statutory reporting requirements entirely in electronic form and to permit information delivery on a "by request only" basis. Regulation FD (Fair Disclosure) in the U.S. also pushes for more use of the Internet in lieu of printed material, because Internet disclosure offers availability to all interested users on the same terms.

The cost reduction aspect has been considered by some regulators for their filing requirements. The SEC requires electronic filings to its EDGAR system, and makes the information publicly available over the Internet. Austria allows XML (extensible markup language) based filings of financial statements to the public registry, and other European regulators, including Germany and the U.K., are discussing the potential regulation for all companies with mandatory public disclosure to file electronic financial statements into a register. The High Level Group of Company Law Experts recommended in their report that the EU should take the initiative in facilitating or requiring electronic filing, and that it should require listed corporations to maintain a financial information section on their websites¹⁸. Initiatives such as these would greatly increase the accessibility of financial disclosures of companies and benefit users. The economic reason for such a regulation is the expectation that the benefits of users exceeds the costs incurred by firms.

18 See *High Level Group of Company Law Experts* (2002), pp. 37–41.

3.2 EFFECTS ON VOLUNTARY DISCLOSURE INCENTIVES

Simple cost-benefit trade-offs do not capture potential interactions between the firm and users. In fact, financial disclosure decisions follow a complex cost-benefit trade-off in which the firm must consider the information endowment and strategic reactions of the users that is brought about by the firm's change in the information costs.

Potential effects of the Internet on financial disclosure can be analyzed by using results from the voluntary disclosure literature. As a benchmark, consider a setting in which a firm, which is interested in a high current share price, is endowed with some piece of information and can make a verified disclosure to the capital market. The capital market holds rational expectations, that is, it is aware of the fact that the firm possesses the information and reacts to the disclosure (or non-disclosure) in a way so that it is not misled, on average. The unraveling principle states that in such a setting, the only sequential equilibrium is full disclosure of the firm's information¹⁹.

Introducing a cost of disseminating information introduces partial disclosure, in that only relatively favorable information is disclosed. The effect of a decrease in this cost is an increase in financial disclosure in equilibrium²⁰. More disclosure generally occurs in the region of less favorable information. Thus, the cost decrease triggers the disclosure of relatively less favorable news.

Figure 2 shows the structure of such an equilibrium and the effects of a change in the cost. The equilibrium prices for the base case of high cost are shown in solid lines. Due to the high cost, only few firms find it beneficial to disclose their information.

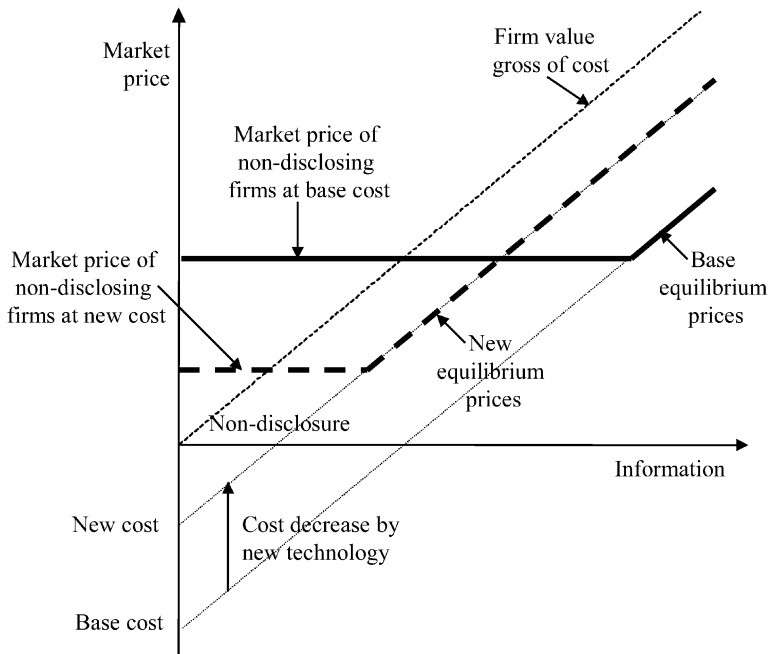
Suppose the cost decreases to the new cost shown in *Figure 2*. The new equilibrium (in broken lines) is such that more firms now have an incentive to disclose their information. However, a comparison of the equilibrium prices reveals that the cost decrease is not to every firm's advantage. Only firms with highly favorable information gain from the cost reduction.

In many situations, ex ante *each* firm may experience a disadvantage from the information-cost decrease. The reason is that the information cost is a dead-weight loss in this setting, a loss that can be avoided if the firm does not disclose. Essentially, the cost decrease leads to more information about firms in the capital market but may lower the average market prices²¹. Thus, investors might not benefit from the increased disclosure level.

19 See, e.g., *Milgrom* (1981). Intuitively, this equilibrium is supported by skeptical beliefs of the capital market in case information is withheld: The market assumes the worst information in case the firm does not disclose.

20 See *Verrecchia* (1983).

21 The total effect depends on the probability distribution of the information, the cost change, the risk aversion of the investors, and how they use the information. For example, consider a setting in which the expected market price is equal to the private information which is uniformly distributed over $[0, 1]$ and let k denote the disclosure cost. Then the equilibrium is such that there is disclosure

Figure 2: Disclosure equilibrium with different disclosure costs²²

Another insight from such a model is that more precise information is more likely to be disclosed for a given cost²³, which implies that a cost decrease will (*ceteris paribus*) increase the likelihood of a disclosure of less precise information. The reason is that more firms find it worthwhile to separate and disclose their information due to the reduced cost of doing so; the equilibrium market price of non-disclosing firms adjusts accordingly to a lower level.

A different cost that is affected by the Internet is the cost of information acquisition. Lower costs tend to result in more information acquisition and to more disclosure in equilibrium, both in the level of information and of bad news²⁴. If users are uncertain about the cost of disclosure, more disclosure by peers may indicate reduced costs, which will generate the same effect. Similar to the case of disclosure costs, the ex ante effect of a decrease in information acquisition costs is ambiguous. Lower costs motivate more firms to acquire the information; this behavior is anticipated by the users who, given non-disclosure, revise the equilib-

over the interval $[2k, 1]$ for $k < 0.5$. Suppose the base cost is $k = 0.4$, then ex ante, disclosure occurs with probability of 0.2, and the dead weight loss of disclosure is $0.2k = 0.08$. Reducing k to, say, 0.3 increases the probability of disclosure to 0.4, and the dead weight loss is $0.4k = 0.12$. In fact, the dead weight loss is greatest for $k = 0.25$.

²² The figure is adapted from Wagenhofer/Ewert (2003), p. 293.

²³ See Verrecchia (1990); this result depends to some extent on the shape of the cost function (see Richardson (2001)).

²⁴ See, e.g., Dye (1985), Wagenhofer (1990), pp. 36–50.

rium price downwards, which induces more firms to disclose. Firms that possess unfavorable information and do not disclose in the equilibrium with high costs will find that they either disclose in the equilibrium with low cost or, if they still do not disclose, the equilibrium price goes down. They will lose from the lower information acquisition cost.

More disclosure usually increases the information about firms in the capital market. However, this statement is not unambiguously true: It depends on potential reactions by the market participants to the increased financial disclosure by firms. Many investors acquire their own information, which is reflected in the market prices of the firms. More public disclosure typically reduces the incentives to acquire private information. Depending on the structure of private information markets, investors may gain or lose *ex ante* from a firm's disclosure²⁵.

Users incur a cost of information acquisition. Lower costs increase the usage of that information because more users will find it worthwhile to acquire the information. This potentially improves market efficiency, effectively implying a lower cost of capital on average²⁶. However, the comparative competitive advantages of analysts may decline.

4 STANDARDIZATION OF FINANCIAL INFORMATION

4.1 DEVELOPMENT OF XBRL

Although many people think that increased computerization offers more flexibility in various processes, generally the opposite seems to happen. Software is designed to capture standard processes that are foreseen by the software developer. Usually, a departure from such processes is difficult, if not impossible. Computerization of information processes also requires machine-readable data formats. These formats make it hard to insert new items or leave open items that developers assume are required information. For use within firms, data warehouse systems have been introduced to combine different databases with differing formats, which enables the firm to use the databases jointly. It is much more difficult to create some kind of common understanding of processes, and particularly data across firms. Since financial disclosures are used by many different users, standardization of financial information may have high external benefits.

In fact, beginning in 1999, a standardization of financial reporting began on a world-wide scale. Extensible Business Reporting Language (XBRL) is based on extensible markup language (XML), an Internet document description language of which HTML is another subset. XBRL is a market-driven approach undertaken by the private efforts of accounting organizations, individual firms, and other interested parties²⁷.

²⁵ See *Bushman* (1991).

²⁶ See, e.g., *Grossman/Stiglitz* (1980) for an analysis in a noisy rational expectations equilibrium model.

²⁷ For a description of the bodies developing and supporting XBRL see www.xbrl.org and, e.g., *Debreceny/Gray* (2001), *Küting/Dawo/Heiden* (2001), pp. 45–47.

XBRL includes several layers of descriptions of the source data ("meta data"). It defines unique specifications or tags of individual financial reporting data in so-called taxonomies²⁸. In 2000, the first taxonomy for financial statements based on U.S. GAAP was developed. In late 2002, an IAS primary financial statements taxonomy was published that departs in its formal structure somewhat from the original U.S. GAAP taxonomy. Initiatives in several countries, including, e.g., Germany, the U.K., Australia, and Japan, were constituted and started to develop national taxonomies for financial reporting. The taxonomies for primary financial statements include some 2,000 elements that capture individual items in a typical financial report, including the balance sheet, income statement, statement of changes in owners' equity, cash flow statement, notes, and accountant's report. Besides the taxonomies, XBRL uses a tool called link-base to provide calculation schemes, references to the respective standard, and the names in different languages.

A direct cost advantage of XBRL is that financial statement information on the financial reporting level needs to be prepared only once. This information can then be reused in various formats, such as a published financial report in print or on the Internet, filing with a stock exchange or supervisor, loan documents, and also in audit schedules. The multiple use of data avoids transferring data into different formats, a costly, time-consuming, and potentially inaccurate process²⁹. Tagging financial statement information using an XBRL taxonomy is currently still a complicated task, but it can be automated easily as output from standard accounting software packages.

Specifying tags for financial statement data is but one objective of XBRL. Another is to develop a taxonomy for raw business transactions and events that are recorded in the accounting and book-keeping systems. XBRL General Ledger aims to achieve a unified and technology-independent data transfer within companies. This development could make consolidation easier and faster, particularly if newly acquired subsidiaries are involved. It could also improve corporate reporting by allowing users to drill down to the level of raw data which is usually not possible in data warehouse software. Data can also easily be exchanged with the companies' contracting partners, a function that is reminiscent of the various forms of electronic data interchange (EDI) between suppliers and retailers.

Given all these possibilities, it is interesting to note that after about three years on the market, only a handful of companies have yet begun to use XBRL, even though many companies have closely observed its development and have been even involved in the XBRL consortium. It may be that the individual benefits to firms are not significant if there is no standard for using XBRL. A regulatory demand for using XBRL may trigger a positive network effect that implies increasing benefits the more users apply it³⁰. The following implications of XBRL on financial reporting should be read in the light of the low adoption as yet.

28 A technical description can be found, e.g., in *Meyer/Pries/Gröner* (2002).

29 See *PricewaterhouseCoopers* (2002) for a detailed description of the potential benefits of XBRL.

30 For a discussion of network effects in the standardization of financial reporting see, e.g., *Währisch* (2001), pp. 60–64.

4.2 IMPLICATIONS FOR FINANCIAL DISCLOSURE

The information contained in the XBRL tags enables investors, with the help of specialized software (“intelligent” or “smart” agents), to automatically extract and download these data without manually searching the Internet³¹. For example, data can be automatically loaded into a specific investor’s model or tool, such as a spreadsheet program, and then analyzed.

The changing user approaches to financial information may have several implications. First, it is likely that quantitative information will become more important than it already is. Qualitative information and soft facts are difficult to process even though, for example, the IAS taxonomy includes a significant component that is qualitative in nature. Second, the enhanced accessibility of bits and pieces of the full information may mean that investors will read only the selected pieces of information, without considering related information or the context in which the information appears. Firms could be advised to formulate information in more comprehensive block. Third, the pressure to provide comparable, “apples-to-apples” information will increase. Users’ tendency to gather only specific pieces of information is likely to generate a demand to provide convenience translations of financial statements or use a “common” presentation currency, to use a “common” language, to use “common” accounting methods, and to fill in all the information for which tags exist. Comparing financial statements prepared under different GAAP is cumbersome, and therefore, XBRL usage will increase the pressure on companies to report under a single GAAP worldwide, whatever this standard may eventually turn out to be.

More opportunities abound. One is to let investors self-define accounting methods or accounting standards that can then be used to calculate a company’s financial statements. The firm could prepare the results for certain alternative assumptions or under alternative accounting methods, or provide more basic information so that investor requests can be calculated from the original data. With XBRL, it could become easier to get to the details of the differences. In fact, a scenario might be to allow access to unfiltered tagged raw data³². Investors would be able to select, manipulate, and aggregate the raw data in whatever way they wish. However, it is unlikely that firms will find that the benefits of providing such detailed information are worth the cost. Survey results of preparers suggest that firms are reluctant to provide such detailed data, mainly for fear of putting themselves at a competitive disadvantage³³.

A key criterion for the usefulness of an XBRL taxonomy is its comprehensiveness. Since investors will often utilize XBRL to extract comparable information across companies, similar events or information should be assigned the same tags and different events or information should bear different tags. However, there are limits to becoming more specific. The more tags that are available for closely related information, the less useful is the taxonomy for the investor. Experience in apply-

31 A demonstration of such opportunities is provided at www.nasdaq.com/xbrl.

32 See, e.g., *Wallman* (1997). This idea goes back to the fundamentals of financial accounting in the “events versus value” debate (e.g., *Sorter* (1969)) and in cost accounting (e.g., *Laßmann* (1968)).

33 See, e.g., *Trites* (1999), pp. 45–46, *Xiao/Jones/Lymer* (2002), p. 258.

ing the IAS taxonomy in practice indicates that firms use highly idiosyncratic financial information layouts, not only in the notes but also in the income statement and other financial statements. Therefore, standardization of the formats will probably increase, even though XBRL, technically, deemphasizes the issue of the layout. As the word “extensible” in the XBRL acronym suggests, the data provider is free to add to or modify elements of a taxonomy. Doing so has the disadvantage that such information is unlikely to be searched or requested by users who would find it difficult to follow up individual specifications, hence, much of the standardization benefit to vanish. Therefore, formal standardization implies a demand for the standardization of information contents as well. Standardizing contents is not simple for financial statement information, but it is even more difficult for non-financial information, which is often highly firm-specific, such as performance drivers, key measures, strategies, and descriptions of operations.

The XBRL consortium that develops the taxonomies maintains that XBRL does not affect the contents of financial statements at all, but that it merely takes up the required disclosures in an accounting system and categorizes them into a comprehensive set of tags. Seen from the implications for firms and users, creating a taxonomy is not quite so innocent, due to the implications on firms’ disclosure policies. An XBRL taxonomy can be seen as a huge checklist for information, because it shows clearly what information a firm is “expected” to make available but is missing in the firm’s financial statements. Thus, there is a trade-off between the comprehensiveness of a taxonomy that allows more firm-specific information, and standardization that reduces firm-specific content but improves on cross-sectional comparability.

4.3 EFFECTS ON ACCOUNTING STANDARDS

A direct implication of XBRL on financial reporting is that it renders unimportant the structure and sequence of the presentation of financial information. Many standard setters, mainly those from continental Europe, have traditionally given high priority to a strict balance sheet and income statement layout. On the other hand, the IASB and the FASB do not require a strict layout of the financial statements. Under XBRL, tagged information can be found by the appropriate software no matter where it is placed in a document. Therefore, investors can define their own layout and automatically feed a company’s financial disclosures into it. However, as noted above, users are likely to demand more standardized contents, which implies a higher degree of standardization of the layout for items that follow a logical order.

XBRL’s de facto standardization of contents should be of particular interest to accounting standard setters. The common aim of the XBRL consortium seems to be to provide as many national taxonomies as possible to cover different countries and industries. National taxonomies might satisfy the demand of national authorities so that they may be eager to adopt XBRL as the standard for statutory filings. However, national taxonomies do not correspond to the increasing demand for standardization in the capital markets. Cross-sectional comparability could be better served by a common (base) taxonomy. The IFRSs could be a candidate for

such a base taxonomy, and in fact the Consortium seems to be going in this direction. It is no coincidence that the IASB has a strong interest in XBRL and is actively involved in the XBRL consortium. Taxonomies for national GAAP could include a subset of tags that are country-specific. Such an approach could work with additional disclosures, however, it would be more difficult with recognition and measurement requirements, because many accounting rules are not upwards compatible. A base taxonomy with national supplements is an obvious concept from an information systems perspective, but not necessarily optimal from an economic perspective. It would lead to monopolizing the base standard, while there are good reasons for allowing a controlled competition between different standards³⁴.

Users could urge standard setters to reduce the number of options provided by accounting standards, or even to eliminate options altogether. Restricting options would make it easier to process the financial information as reported, because the taxonomy applied is clear from the data contained in the XBRL instance file. The particular accounting option used in a certain context is perhaps less obvious and requires more consideration in processing the data.

Considering the scenario in which firms provide access to raw data, investors would be able to access an XBRL-based financial accounting database that records all raw business events, and could apply their own accounting standards. As a consequence, the role of standard setters would diminish. Standard setters would compete with analysts and private for-profit firms to provide models that read XBRL raw data and transform them into decision-relevant summary information for investors³⁵. The criterion for competitive advantage would be to provide the best solutions for investors who make decisions based on company information.

We might speculate on what type of standards would survive the market test. It might be standards that require only a little additional information usually not included in the raw business data. A perfect example would be pure cash flow statements that can easily be derived from business data. However, accruals usually carry much more information about properties of business transactions. It is difficult to imagine that such developments could seriously question the (marginal) usefulness of financial statements.

5 INFORMATION QUALITY

The quality of financial disclosures on the Internet is an important issue. Unreliable financial information on the Internet is less relevant or irrelevant for rational users, and can have a detrimental impact on other users. Financial information generally has a higher degree of trustworthiness than other information because it is embedded in corporate governance mechanisms, and it is subject to auditing and enforcement. A major advantage of the Internet is its flexibility, which, how-

³⁴ See, e.g., *Sunder* (2002), *Benston et al.* (2003), pp. 61–65.

³⁵ In some sense, there is already competition going on. An example is Standard & Poor's definition of "core earnings". Moreover, many firms provide pro forma earnings that differ from related GAAP earnings.

ever, creates a disadvantage for credibility and authenticity. Data can easily be changed, often without leaving a trace, particularly if the website is dynamically linked with an underlying database. New information can be communicated not only by adding that information, but also by replacing the original information. For example, in the light of new events, why not revise a previous forecast in the latest directors' report? What about just changing the wording in the financial statements, at least for a few critical days?

Often, it is not so much the fact that data can be manipulated by a company, rather is it the conscious selection of which data a firm provides via the Internet. Hyperlinks can be included to point to various other sources, including the auditor's report, which may or may not be appropriate in the context, or to external sources like a favorable analyst report. With XBRL, firms may have incentives to become creative in their tagging: For example, because investors will be tempted to work with the data provided by the extraction software, and without double-checking all details, a company that wishes to hide a certain piece of information may well attempt to not tag it, to place it in a certain tag, or to define an individual tag. To assure the quality of disclosures, the auditor would have to check whether the assignment of tags was meticulously performed.

Another issue affecting information quality is the security of the website. It may be difficult to control who has access to the website or its underlying database. Needless to say, fraud, hostile intruders, and hackers can and do find holes in the security net and alter data without knowledge of the company.

Issues like these suggest that financial disclosure provided via the Internet is less credible than is information from other company sources. The credibility is not only of concern to companies and users, but also to auditors and regulators. As *Debreceeny* and *Gray* describe it, "the auditor's report becomes part of the chaotic morass of information that characterizes the web"³⁶.

One way to cope with these concerns is to restrict the opportunities the Internet offers to those that are less affected by such possibilities. For example, auditors may decide not to allow links to and from the auditor's report, or to require that it be stored on the auditor's own or on an official registrar's website. Actually, the most common practice is to provide the annual report in a read-only facsimile version (e.g., in Adobe's PDF format). Such formats can be interpreted as assuring the Internet user of the boundaries and quality of the information.

If firms were to produce real-time reports or allow users to access raw data, auditors would have to change their audit procedures from mainly outcome-related to continuous, process-related audits³⁷. That is, since the data are dynamically changed during the course of the business, the audit would have to attest to the system of data entry rather than the result. This system includes the processes, preparation, and integrity of the data³⁸. The auditor could also be asked to actively monitor the client's website or to keep track of changes of particular

³⁶ *Debreceeny/Gray* (1999), p. 336.

³⁷ See, e.g., *Alles/Kogan/Vasarhelyi* (2000).

³⁸ See *Wallman* (1997), p. 111.

pages. Currently, there are no auditing standards that adequately address these issues³⁹. For example, the AICPA maintains that websites are not “documents”, which implies that auditors are not required to read such information⁴⁰. However, currently, not all corporate disclosures are audited. In fact, most disclosures other than annual financial statements are unaudited, and so could be Internet disclosures.

The lack of public standards leaves room for private initiatives to increase trustworthiness. An example could be the certification of the website, similar to WebTrust. WebTrust awards a seal to a company’s website if the website follows certain business standards, mainly giving assurance to customers in e-commerce. XML, a standard of which XBRL is a specific subset, provides a digital signature to authorize information.

Some stock exchanges and regulators have issued guidelines which include certain principles that financial disclosure on the Internet should follow. The French Commission des Opérations de Bourse was probably the first such organization. For Minitel, a precursor of the Internet that had been popular in France, it issued recommendations for disclosure of listed corporations already in 1993. The recommendations were revised to address the use of the Internet in 1999. In the same year, the Toronto Stock Exchange issued guidelines that aimed at encouraging companies to use the Internet to provide financial information, and it defined principles, some of which were considered obligatory. A research study by the Canadian Institute of Chartered Accountants also includes recommendations for standards⁴¹. The (then) IASC followed suit and published a discussion paper in which it provided detailed guidelines as a code of best practice⁴². The IASB did not take up its predecessor’s suggestion to develop a reporting standard based on these guidelines. Instead, the IASB halted the project in 2001, arguing that it was not concerned with the contents of financial information but was closer to corporate governance issues so that the IFAC might be better equipped to work on the issue. In fact, the IFAC staff prepared a paper which includes general guidelines and principles for reporting on the Internet⁴³. Currently, there are no guidelines for financial disclosure on the Internet in the U.S. despite all the effort put into discussing related issues⁴⁴.

In the future, we can expect to see increasing regulation of financial disclosure on the Internet. As the history of accounting regulation suggests, a higher degree of regulation has almost always been triggered by financial scandals. In a Delphi study, an expert from academia noted that “The first Internet reporting scandal has yet to take place, but if it does, it is likely to provide a significant spur to the development of regulation”.⁴⁵

39 See also *Kütting/Dawo/Heiden* (2001), pp. 72–80.

40 AUS 9550. For a discussion whether this will hold in courts see *Debreceny/Gray* (1999), p. 344.

41 See *Trites* (1999).

42 See *Lymer et al.* (1999), pp. 62–66.

43 See IFAC (2002).

44 See FASB (2000).

45 *Xiao/Jones/Lymer* (2002), p. 261.

It remains to be seen whether national regulation can be an efficient means of disclosure regulation, or whether there is a need for a global standard. Since the Internet is truly multinational, e.g., the location of the company or the institution responsible for the content, the location of the server, and the location of users are likely to differ, and hence the jurisdictions that apply, there may be a need to coordinate standards. Regulation would end the current experimentation stage⁴⁶, and with it some of the possibilities for innovation based on current, or currently perceivable, future technology. Moreover, we should keep in mind that technology moves faster than regulators can.

6 CONCLUSIONS

Philip D. Ameen of General Electric recently predicted that "Debates about how pension surplus or derivatives or leases affect 'net earnings' will seem as amusing then as the handwritten ledgers of the 1900's seem to us now".⁴⁷ In contrast to that prediction, this paper argues that the rise of the Internet and its increasing use for financial reporting does not change the fundamentals of financial accounting and disclosure. Changes in financial reporting are triggered by fundamental changes in how business is performed, not by the way how transactions and events are recorded⁴⁸. The Internet developments certainly remove some barriers to financial disclosure and offer new opportunities that had not been worth the cost earlier on. But there must be an economic demand for such disclosures in the first place. It is not created by modern information technologies.

This paper studies the economic consequences the Internet has on financial reporting. It analyzes the effects of a change of the information costs, and shows that more disclosure is the consequence of declining disclosure costs and greater user information demands. However, because of market price adjustments occurring due to the changed environment and firms' strategic disclosure responses, these consequences are not necessarily always beneficial in a capital market setting.

The paper also discusses that the increasing use of Internet financial reporting increases the demand for standardization, of which the XBRL is the most significant product. Although the XBRL developers maintain that they model only a meta-language for existing disclosure standards and practice, it is likely that a widespread adoption of XBRL will in fact also standardize the contents of financial disclosure. Thus, the contents and form of disclosure cannot be separated.

⁴⁶ Consider, for instance, a way to cope with boundaries of information by prohibiting the use of hyperlinks to sources outside the document. Such a rule would eliminate concerns of data integrity and the like, but also negate a major useful characteristic of Internet technology.

⁴⁷ Testimony on behalf of the FEI before the U.S. House of Representatives Subcommittee on Capital Markets, Insurance & Government Sponsored Enterprises on June 7, 2001 (<http://www.house.gov/financialservices/060701wl.htm>).

⁴⁸ However, the accounting may well determine whether or not transactions are performed. For instance, it is said that Enron and others entered into long-term futures contracts mainly to increase accounting discretion, as these contracts are measured at fair value.

Financial reporting on the Internet creates concerns for the quality of the information. The technological flexibility the Internet provides for the firms that generate the disclosures may be easily misused, and may therefore create a demand for more and different auditing services and more regulation. These factors are another cost that should be considered alongside other effects.

As a consequence, simple generalized statements about the overwhelming benefits of the Internet and XBRL are not well founded in economic theory, but require a more thorough consideration of the costs and benefits of financial reporting. This paper provides some general insights into the trade-offs involved but certainly does not resolve all the issues that are important in this regard.

REFERENCES

- Alles, Michael/Kogan, Alexander/Vasarhelyi, Miklos A. (2000), Accounting in 2015, in: The CPA Journal, Vol. 70, November.
- Benston, George/Bromwich, Michael/Litan, Robert E./Wagenhofer, Alfred (2003), Following the Money – The Enron Failure and the State of Corporate Disclosure.
- Bushman, Robert M. (1991), Public disclosure and the structure of private information markets, in: Journal of Accounting Research, Vol. 29, pp. 261–276.
- Debreceeny, Roger/Gray, Glen L. (1999), Financial Reporting on the Internet and the External Audit, in: European Accounting Review, Vol. 9, pp. 335–350.
- Debreceeny, Roger/Gray, Glen L. (2001), The Production and Use of Semantically Rich Accounting Reports on the Internet: XML and XBRL, in: International Journal of Accounting Information Systems, Vol. 2, pp. 47–74.
- Debreceeny, Roger/Gray, Glen L./Rahman, Asheq (2002), The Determinants of Internet Financial Reporting, in: Journal of Accounting and Public Policy, Vol. 21, pp. 371–394.
- DiPiazza, Samuel A./Eccles, Robert G. (2002), Building Public Trust – The Future of Corporate Reporting.
- Dye, Ronald A. (1985), Disclosure of Nonproprietary Information, in: Journal of Accounting Research, Vol. 23, pp. 123–145.
- Eccles, Robert G./Herz, E., Robert H./Keegan, Mary/Phillips, David M.H. (2001), The Value Reporting Revolution.
- Elliott, Robert K. (1992), The Third Wave Breaks on the Shores of Accounting, in: Accounting Horizons, Vol. 6, pp. 61–85.
- Ettredge, Michael/Richardson, Vernon J./Scholz, Susan (2002), Dissemination of Information for Investors at Corporate Web Sites, in: Journal of Accounting and Public Policy, Vol. 21, pp. 357–369.
- FASB (2000), Business Reporting Research Project: Electronic Distribution of Business Reporting Information.
- Garten Task Force (2001), Strengthening Financial Markets: Do Investors Have the Information They Need?, Report of an SEC-Inspired Task Force, May.
- Grossman, Sanford J./Stiglitz, Joseph E. (1980), On the Impossibility of Informationally Efficient Markets, in: American Economic Review, Vol. 70, pp. 393–408.
- High Level Group of Company Law Experts (2002), Report on a Modern Regulatory Framework for Company Law in Europe, Brussels, November.
- ICAEW (Ed.) (1998), The 21st Century Annual Report.
- IFAC (2002), Financial Reporting on the Internet.
- Jensen, Robert, E./Xiao, Jason Zezhong (2001), Customized Financial Reporting, Networked Databases, and Distributed File Sharing, in: Accounting Horizons, Vol. 15, pp. 209–222.
- Kütting, Karlheinz/Dawo, Sascha/Heiden, Matthias (2001), Internet und externe Rechnungslegung.
- Laßmann, Gert (1968), Die Kosten- und Erlösrechnung als Instrument der Planung und Kontrolle in Industriebetrieben.

- Lev, Baruch/Zarowin, Paul* (1999), The Boundaries of Financial Reporting and How to Extend Them, in: *Journal of Accounting Research*, Vol. 37, pp. 353–385.
- Lymer, Andrew* (Ed.) (1999), Special Section: The Internet and Corporate Reporting in Europe, in: *European Accounting Review*, Vol. 9, pp. 287–396.
- Lymer, Andrew/Debreceeny, Roger/Gray, Glen L./Rahman, Asbeq* (1999), Business Reporting on the Internet, IASC Discussion Paper, London, November.
- Meyer-Pries, Lars/Gröner, Susanne* (2002), Web-Publizität und Datenaustausch mit XBRL, in: *Finanz Betrieb*, Vol. 4, pp. 44–53.
- Milgrom, Paul R.* (1981), Good News and Bad News. Representation Theorems and Applications, in: *Bell Journal of Economics*, Vol. 12, pp. 380–391.
- Ordelbeide, Dieter* (1999), Rechnungslegung im digitalen Zeitalter, in: *Gebhardt, Günther/Pellens, Bernhard* (Eds.), *Rechnungswesen und Kapitalmarkt*, zfbf, Sonderheft 41, pp. 229–253.
- Pellens, Bernhard/Füllbier, Rolf U./Gassen, Joachim* (1998), Unternehmenspublizität unter veränderten Marktbedingungen, in: *Börsig, Clemens/Coenenberg, Adolf G.* (Eds.), *Controlling und Rechnungswesen im internationalen Wettbewerb*, pp. 55–69.
- PricewaterhouseCoopers* (2002), Corporate Communications for the 21st Century.
- Richardson, S.* (2001), Discretionary Disclosure: A Note, in: *Abacus*, Vol. 37, pp. 233–247.
- Shapiro, Carl/Varian, Hal R.* (1999), Information Rules. A Strategic Guide to the Network Economy.
- Sorter, George H.* (1969), An Events-Based Approach to Basic Accounting Theory, in: *The Accounting Review*, Vol. 44, pp. 12–19.
- Sunder, Shyam* (2002), Regulatory Competition Among Accounting Standards Within and Across International Boundaries, in: *Journal of Accounting and Public Policy*, Vol. 21, pp. 219–234.
- Trites, Gerald D.* (1999), The Impact of Technology on Financial and Business Reporting.
- Verrecchia, Robert E.* (1983), Discretionary Disclosure, in: *Journal of Accounting and Economics*, Vol. 5, pp. 179–194.
- Verrecchia, Robert E.* (1990), Information Quality and Discretionary Disclosure, in: *Journal of Accounting and Economics*, Vol. 12, 365–380.
- Wagenhofer, Alfred* (1990), Informationspolitik im Jahresabschluß.
- Wagenhofer, Alfred/Ewert, Ralf* (2003), Externe Unternehmensrechnung.
- Währisch, Mark* (2001), The Evolution of International Accounting Systems.
- Wallman, Steven M. H.* (1996), The Future of Accounting and Financial Reporting, Part II: The Colorized Approach, in: *Accounting Horizons*, Vol. 10, pp. 138–148.
- Wallman, Steven M. H.* (1997), The Future of Accounting and Financial Reporting, Part IV: “Access” Accounting, in: *Accounting Horizons*, Vol. 11, pp. 103–116.
- Xiao, Zezhong/Jones, Michael John/Lymer, Andy* (2002), Immediate Trends in Internet Reporting, in: *European Accounting Review*, Vol. 12, pp. 245–275.
- Zarowin, Stanley/Harding, Wayne E.* (2000), Finally, Business Talks the Same Language, in: *Journal of Accountancy*, Vol. 189, July, pp. 24–30.