December 14, 2007

Monopoly or Competition: Standard Setting in the Private and Public Sector

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Preliminary Draft: December 14, 2007

We thank Michael Gibbins as well as Workshop participants at Carnegie Mellon University, McMaster University, National Taiwan University, and Yale University for helpful comments. We also thank Wayne Morgan and Beini Feng for research assistance on this project. Please send comments to authors at karim.jamal@ualberta.ca or shyam.sunder@yale.edu.

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Abstract

Financial accounting standards in the U.S. are developed by private standard setting organizations (SSOs) that operate under the oversight of a government agency. The primary accounting SSO (FASB) has been criticized for writing too many standards (standards overload), the complexity of its standards, the processes by which its standards are set, and the absence of a competitive mechanism to help set standards. The present study seeks to assess the validity of these concerns by looking at standard setting processes in the broader economy.

The study consists of three parts. In Section 1, we present some historical data on standard setting activity and document standards set by 604 private and 80 government SSOs in the U.S. We find that there is a time trend in favour of greater reliance on private rather than government SSOs. Accounting standard setters are late entrants in the field of setting standards and appear to be relatively slow in developing new standards. However, accounting standards are relatively long and complex, thus possibly justifying complaints of standards overload. In Section 2, we propose a framework for analysis of the types of standards (quality versus co-ordination) and the processes by which standards are set (monopoly versus competition). We present some data on how standards are set by Government SSOs and provide a detailed comparison of the standard setting processes of four competing technology oriented SSOs relative to the FASB. The comparison highlights a number of features where the FASB differs from other SSOs. These include: the use of sanctions, the threshold of agreement required for standards adoption, and standards competition. In Section 3, we provide data on standards competition in the economy. This includes a case study of internet telephony where competing SSOs have fundamentally transformed the telecommunications industry. Implications for accounting standard setting are discussed.

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"…results are suggested by experience in other fields of study; and conceivably accounting is unlike these in nature and difficulty. If accounting differs from other subjects in its nature, then the arguments that follow may be weakened. But I see no reason to think that it is different."

William Baxter ([1953], p. 420)

"The wonderful thing about standards is that there are so many of them to choose from."

Rear Admiral (Retd.) Grace Hopper

1. Introduction

One of the most salient features of the recent history of financial reporting is the formal standardization of accounting (Baxter [1953]). After the passage of the U.S. federal security laws in 1933-34, financial reporting has been characterized by sustained movement toward written standards, and away from social norms (Sunder [2005a, b]). A large body of research attempts to assess accounting and its standardization within its own domain. However, standards are not peculiar to accounting, and are used widely in virtually all aspects of modern economies to serve a variety of purposes (Cheit [1990]). In order to better understand this seven-decade long trend toward standardization of accounting, it is useful to examine it in the context of the extent, role and processes of standardization in the economy at large[1]. This paper is a tentative attempt in this direction.

In the economy at large, standardization activities are carried out by government departments and agencies, as well as outside the government hierarchy by professional, industry, cooperative and not-for-profit organizations (to which we apply the label "private" in contradistinction to "government"). Private standard setting is often conducted with the support, cooperation or supervision of government agencies. The setting of accounting standards in U.S. and Europe remains in "private" hands in this sense. We discuss the implications of this assignment of responsibility for

[1] For a bird's eye view of the standards domain, see the websites of International Organization for Standardization or ISO (http://www.iso.org/iso/en/ISOOnline.frontpage), and American National Standards Institute or ANSI (http://www.ansi.org/default.aspx). As of September 30, 2007, ISO had XXX standards in place. Also see http://en.wikipedia.org/wiki/Standardization and http://en.wikipedia.org/wiki/Standards_organization.

accounting standards in light of experience with how standard setting activities are organized in the larger economy.

The paper is organized as follows. Section 2 provides historical evidence on the timing and rate of formation of standard setting bodies, the number of standards issued by private and public sector standard setters in the economy, and a comparison of the length and complexity of FASB's accounting standards with the engineering standards set by the Internet Engineering Task Force (IETF). Section 3 develops a framework which distinguishes between quality and co-ordination standards. The framework also relates the use of monopoly and competitive forms of organizations in standard setting to the underlying quality and co-ordination functions of their standards. Evidence on standard setting activities in the government is summarized. We also compare the processes used to set standards in accounting and in four technology oriented SSOs . Section 4 focuses on standards competition and presents data on how many standard setting bodies are involved in each industry in the economy, and a case study of standards competition in internet telephony. Finally, Section 5 examines some implications of our findings for accounting standard setting and regulation.

2.0 A Historical Perspective on Standard Setting

2.1 Formation of Standard Setting Bodies

Modern economies are characterized by extensive use of standards set by public and private standard setting bodies that cover a wide range of goods and services produced in the economy (Brunsson [2002], Castells [1996], Cheit [1990]). Standard setting and certification (see Jamal and Sunder [2007]) are pervasive in the economy. The U.S. National Institute of Standards and Technology (NIST) conducts periodic surveys of government and private sector SSOs in the U.S., and tabulates their activities (Martino [1941]; Booth [1960]; Hartman [1967]; Chumas[1975]; Toth [1984]; Toth [1991] and Toth [1996b]. The most recent ([1996]) edition of "Standards Activities of Organizations in the United States" reports the standards related activities of 684 organizations (80 governments and

604 non-governments) in the U.S. To prepare the 1996 version of this directory, 100 federal government agencies, and 1,200 private sector organizations were invited to participate in the study.

Formation of government and private SSOs in each of the past 13 decades is shown in Figure 1. Government SSOs started being formed soon after the creation of the Union and there were already 12 such bodies in existence prior to 1878 (e.g., the Bureau of Alcohol, Tobacco and Firearms (formed in 1789), the U.S. Mint and U.S. Customs (both formed in 1792). The private sector was slower in organizing standard setting organizations and there were only 3 private standard setting bodies in existence prior to 1878 (U.S. Pharmacopeia founded in 1820, Bureau of Shipping in 1862 and American Association of Nurserymen in 1876).

The formation of private sector standard setters peaked in the 1930s with 97 new private standard setting organizations created in the New Deal era. There has been a steady decline in formation of new private standard setting organizations in the last six decades with only 10 new private standard setting bodies formed in the 1990s. Formation of government SSOs appears to follow a generational cycle with spikes in the decades of 1900-1910 (12 new SSOs formed), 1930-1939 (15 new SSOs), and 1970-1979 (18 new SSOs). Glaeser and Shleifer ([2003]) suggest that government regulation of business activity had a noticeable growth spurt during the first decade of the 1900s (the progressive era) due to the passage of the Pure Foods and Drug Act in 1906. This act brought food, drugs, and medicines under federal government's regulatory control. This act also led to federal inspection of meat in the United States. Banks (Federal Reserve Act was passed in 1913) also came under government regulation during this period. Cheit ([1990]) has proposed that private standard setting is proactive and tends to anticipate problems, whereas government standard setting tends to be reactive, and follows a well publicised crisis in an activity.

In accounting, there is a tendency to focus on the Securities laws of 1933 and 1934 as major legislative events that changed the regulation of business. The historical record indicates a major spurt of both government and non-government standardization and regulation from 1900 to the 1950s with a peak level of activity in the 1930s of which securities regulation was a part. In the 1930s government bodies were formed to regulate agricultural products, occupational health and safety, housing and health and human services (as well as the Securities Acts of 1933 and 1934). In the private sector there was also rapid formation of standard setting organizations focusing on grains, scientific testing, adhesives, air transport, plastics and paediatrics. There was also a spike in formation of government standard setting bodies during the 1970s with extensive environmental, mining and transportation safety regulation. Likewise, the private sector formed new standard setting organizations focused on construction materials, bar coding, publishing, furniture and accounting standard setting in the 1970s.

A spike in formation of standard setting bodies over a 30-40 year period suggests a generational effect on regulation. Each new generation appears to spark a new demand for SSOs in both the public and private sector. Given this trend, perhaps we should not be surprised if the current decade brings another spike of which PCAOB could be a part. There is also considerable variation across countries in terms of what activities are regulated in the private as opposed to the public sector. Many activities that are regulated by the public sector in the U.S. are regulated by the private sector in other countries (e.g., Sweden), and vice versa. While we are not aware of any direct large sample comparison, Cheit ([1990]) uses this natural variation across countries to do four case studies of safety related SSOs. Two of the activities are regulated by the public (private) sector in the U.S. (Sweden), and two are regulated by the private (public) sector in the U.S. (Sweden). Cheit ([1990]) documents differences in responsiveness of these bodies to pressure from private industry and political processes, but was unable to find a systematic effect on the nature of the actual standards set.

2.2 Number of Standards Set by Government and Private Standard Setters

The total number of U.S. government standards has been rising steadily from about 39,500 standards in 1967, to 52,500 in 1991 (see Table 1). During the 1990s, there was a concerted effort to reduce government standards (Toth [1996a]). The U.S. government adopted a strategy of increasing reliance on private standard setting. By 1996, this policy change led to a decline in government standards to 44,000. This decline was offset by an increase in private standards from 14,000 in 1967 to 49,000 in 1996. In 1996, for the first time, the number of private standards exceeded the number of standards set by the government (Toth [1996b]). There was also a large increase in the number of standards set by the International Standards Organization (ISO) from 650 in 1967, to 8,205 in 1991 and to 10,745 ISO by 1996. A rise in standards set by private SSOs and international agencies such as the ISO appears to be a trend. The move to create international accounting standards is consistent with the trend elsewhere in the economy towards internationalization of standard setting. However, in the broader economy internationalization is often coupled with simultaneous existence of a variety of national SSOs as well (e.g., for shoes, clothing, chemicals, electronics).

Accounting standard setters are late entrants in the overall private standard setting activity in the economy. The Financial Accounting Standards Board (FASB) was formed in 1973, though predecessor boards had been formed in the 1940s and 1950s, compared to the 19th century and the first half of the twentieth century in several other industries and professions. A list of the top 15 non-government standard setters in the U.S. is given in Table 2.

Table 2 shows that as of 1996, the largest source of non-government standards was the American Society for Testing and Materials (ASTM). ASTM began issuing standards in 1898 and had issued 9,900 standards as of 1996. The well-known organization, Underwriters Laboratory (UL), #11th on the list was founded in 1894 and had issued 780 standards as of 1996. The American Petroleum Institute (founded 1919) was #15 on the list having issued 500 standards as of 1996. By comparison, the FASB had issued 127 standards as of 1996.

2.3 Standards Overload

Complaints about standards overload and responses by FASB claiming to deal with such overload are common in accounting. These complaints are about the volume of standards, excessive levels of complexity, and excessive level of detail in accounting standards (Seidler 1990; FASB

2002)[2]. Yet the data presented in Section 2.2 indicate that accounting standard setters are relatively small players in the world of private standards that dominate the economy. Could these complaints be without substance, and simply be rhetorical devices to argue against specific standards? There is no generally accepted method of assessing the correct level of standardization in accounting. In order to begin a discussion about standards overload, we decided to compare the FASB to other professional bodies to look at number of standards issued as well as the complexity of standards.

As an initial step, we chose four criteria to compare FASB standards with standards set in another professional field by the Internet Engineering Task Force (IETF): number of standards, reading level of the language of standards, length of standards and the length of sentences and words used in standards. These findings are shown in Figure 2.

Panel A of Figure 2 shows that IETF issued more standards than the FASB (4,500 vs. 159 as of July 30, 2007). Other factors being equal, one might conclude that the FASB is too reticent, not too prolific, in generating new standards (See Seidler 1990 for a complaint that FASB is too slow in developing standards).

Panel B of Figure 2 compares the complexity of standards issued by FASB and IETF. We used a Flesch-Kincaide index (Flesch [1948], Kincaid et al., [1975]) to rate the number of years of schooling required to understand a piece of text. We obtained an electronic copy of all 159 standards issued by the FASB as of July 30, 2007. We also obtained an equal matched sample of 159 IETF standards as of July 30, 2007. We then computed a Flesch-Kincaide reading index grade level score for each standard[3]. The data in Panel B of Figure 3 shows that FASB standards (mean years of schooling required of 10.62) have always been more complex (less readable) than IETF standards which have a

[2] The most recent proposal to deal with standards overload is to propose to have a separate (and less onerous) GAAP for private companies.
[3] A Flesch-Kincaide readability test measures the difficulty of reading a passage of text using objective measurements such as number of words and sentences. There are two versions of the test: a reading test score version which is used by many federal government departments as a standard to assess the difficulty of forms and documents. The second grade level version also uses objective measures to compute a U.S. grade level, that is the number of years of education required to read a piece of text.

mean schooling required of 8.46 (t = 13.1, p = 0.000). It is not common knowledge that accounting standards are more difficult to read than engineering standards.

In Panel C and D of Figure 2, we report two alternative measure of standard complexity, namely the average number of words per sentence and per standard. FASB's standards have about 6 words per sentence compared to about 5.5 words for IETF standards. FASB standards have a mean length of 13,670 words whereas IETF standards have a mean length of 8,800 words (t= 27.15, p<0.000). There has been a significant increase in the average length of FASB standards especially after 1997 (from approximately 11,000 words to 31,000 words per standard). There has also been an increase for IETF standards but of a much smaller magnitude (from approximately 5,000 words to 10,000 words per standard). This suggests that complaints about standards overload may be driven in part by reading complexity and the increase in the size of an average accounting standard, rather than the number of standards.

This first cut on preliminary data suggests that the rhetoric of standards overload in accounting may be overstated. It is possible that the complaints about standards overload are in reality complaints about the content, not the number or complexity of accounting standards. On the other hand, it is surprising to find that accounting standards are more complex (and a lot longer) than internet engineering standards. Perhaps these initial measures will stimulate more thought about how to assess and compare the quality of work of standard setting organizations.

3.0 Framework: Properties of Standards and The Processes By Which They are Developed

3.1 Quality Standards

There are good economic rationales, as well as limits, for standards. The same basic arguments apply to accounting as well as other industries.[4] Quality and coordination are two salient functions of standards. Quality standards take the form of specified minima for each attribute of each product category. Such standards can be used when the buyers' preference changes monotonically in the value

[4] See Sunder ([1988]) and Krislov ([1997]).

of the attribute in one direction (and in most cases, the cost to the seller changes monotonically in the other direction). Accordingly, from the buyer's point of view, quality standards help ensure minimum quality of products or services, while from the seller's point of view, they help determine the maximum cost to meeting the buyer expectations of the product or service.[5] Once the quality standard has been specified, people engaged in transactions can use them as a guide for their own decisions, minimizing the cost of communication and the chances of miscommunication.

Quality standards are motivated by concerns that some producers would be motivated to lower quality. This fear becomes real when the quality is not readily observable to the customer, and special effort or cost must be incurred to assess the quality of output. In such situations, as Akerlof ([1970]) suggested, competition among sellers for customers' dollars tends to lower the quality as well as the price of the output, and in extreme cases, ultimate collapse of the market into a "market for lemons." In such situations, it may be advantageous to all, producers as well as customers (subject to limitations of cost), to define and enforce quality standards, possibly by establishing a system of ratings or certification that facilitate transactions by minimizing the asymmetry of quality information between buyers and sellers.

Quality standards can be generally identified as those which order output by quality. Percent of foreign material or impurities, strength, probability of failure, chances of defect, smoothness, are examples of characteristics that may be used to define quality standards, depending on the context. These are sorts of standards on which the seller could save money by lowering the quality, and the definition of transaction would be incomplete if a standard definition were not included in commercial contracts. While there are plenty of examples of quality standards established by industry groups in the private sector, these kinds of standards are more likely to be made by government bodies. US

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[5] For example, see the following standard for Russian Gluten Milling Wheat 3 (http://www.agriseek.com/market/p/Russian-Gluten-Wheat.htm, downloaded on February 25, 2006):
Russian milling wheat, 3 , sound, merchantable, crop 2005; Test weight: min78 kg/hl; Protein : min 12.5pct (Dry matter N 5.7); Moisture: max 14 pct; Wet Gluten : min 24 pct; Foreign matter: max 2 pct; Grain matter: max 3 pct; Falling number: min 250 sec (Hagberg); Insect damage: max 1.5; IDK : max 85.

Department of Agriculture for beef, Environmental Protection Agency for water and air quality, and Department of Transportation standards for car safety such as minimum impact resistance for car bumpers, are examples of quality standards. The same is true of standards for food safety that govern production, storage, preparation, and serving of food in various states and cities ([Cheit 1990]).

With all things being equal, higher quality is always desirable for the consumers, and usually results in higher cost for the seller. Selection of quality standards is a matter of trading off the costs and benefits of higher quality. Consequently, such standards can take the form of minimum quality; leaving producers free to choose a higher level if they so wish. They can also take the form of grading standards, which defines two or more classes ranked by grade, each with a minimum standard of its own (see Jamal and Sunder [2007] for a discussion of grading standards in the private and public sector). The conceptual framework can be considered to be a tool devised to help accounting standard setters to construct and assess quality standards.

3.2 Coordination Standards

Even when the preferences of the transacting parties are not monotonic in the relevant attributes of the products and services, they may still need to coordinate on these attributes in order to obtain satisfactory results. The base diameter, the pitch and the shape of threading on the base of an electric bulb must match the design of the bulb sockets for either component to be of any use. Here the key issue is coordination not quality. A small change in diameter, for example, is no more or less desirable to the buyer or the seller, as long as the two parts fit together. These standards, too, reduce the cost of communication and transactions by making it easier for all parties to find satisfactory counterparties. As can be seen in the example of a coordination standard (see Figure 3 for an example—unified thread standard from American Society of Mechanical Engineers/American National Standards Institute), the relevant attributes are not necessarily more or less desirable (in contrast to quality standards example given earlier where the attributes are directional). Coordination standards, which are intended to obtain a mutual fit among various actions or components for the sake of enhanced efficiency (between threads on screws and bolts in our example). There is no obvious way of ranking alternative coordination standards. Driving on the left or right hand side of the road, the distance between rails of a railroad track, the shape and pitch of the threads on a bolt or nut, collar sizes of shirts, the diameter of the base of screw-in electrical lamps, are all examples of coordination standards. They simply make life easier for the makers and users of products and services. Such standards are more likely to be created in the private sector. The argument for consistency and comparability, as well as the attempt to create a uniform definition of assets and liabilities, are like co-ordination standards in the private sector. These standards are not justified as being better on some quality dimension; they are appeals to co-ordination only. The broad umbrella of regulation can be said to cover both quality as well as coordination standards created by government agencies or private standard-setting bodies.

3.3 Monopoly and Competitive Standard Setting

Whether the SSOs, and their standards, have a monopoly or have to compete for the allegiance of users have important consequences for the economy. We examine these consequences, and the circumstances that are likely to give rise to monopoly versus competitive standards regimes before turning to a discussion of the conditions prevailing in the accounting domain.

A monopoly standards regime has the obvious advantage of better coordination; it is also more efficient in the short run. Standardizing all driving on the right (or left) side of the road in an entire country or continent is an obvious example of gains that can be obtained from coordination. Since there are no differences in efficiency, once chosen, the fixed investments in learning how to drive ensure that the monopoly regime of driving on a given side of the road will be stable for a long time period.

Likewise, an airline which uses only one model of aircraft saves on parts inventory, maintenance, fleet size, scheduling, and staff training, etc. A university IT department that allows only one model, language or software suite also saves money. A university that requires all applicants to take a Scholastic Aptitude Test (SAT) saves much effort in evaluating the applications of students coming from diverse school systems. Further, many universities asking for the SAT tests yield economies of scale in devising and administering the test, and each student has to take the test only once to support applications to multiple schools. A uniform commercial code and a system of weights and measures lower the cost of transactions and thus promotes commerce. Availability of 110 volt 60 Hz alternating current in homes and offices through a standardized wall adapter cuts the cost of appliances. Giving preference, if not monopoly, to some systems and designs over others is the essential feature of all schemes of standardization (Sunder 1988 and 1997).

However, there are also some costs associated with standardization (Krislov [1997]). Penalties associated with deviation from a standard discourage innovation. For a monopoly standard, deviation is hardly possible without a mass rebellion which arrives only after a head of steam of resentment against the current regime has been built up. Discovery of better designs and practices is not only discouraged, it is also made difficult because there are few alternatives for making comparisons. If standards are made a public good, their developers cannot capture any gains from standardization and do not have incentives to develop better standards except as a government body or industry collective.

These features of standards suggest that there should be room for competition among standards. Most airlines fly multiple models and makes of aircraft, most IT departments support alternative equipment and software, most universities accept SAT as well as some lesser known alternatives, and some industries (cotton and diamonds for example) have their own commercial code. In corporate law, competition among the fifty states of the U.S. prevails. Likewise, there is competition among university accreditation bodies, state and federal bank regulators, stock exchanges, and even provision of single-phase and three-phase electric current providing 110, 207 and 240 volt electricity in U.S. There are multiple competing standards for cellular phones, data networks, computer operating systems, and how characters are represented by 0-1 bits in computers. All these variations, and thousands of others, are norms instead of being exceptions. They sacrifice certain efficiencies provided by a monopoly for the sake of innovation and development of even better standards.

In U.S., and EU, monopoly financial reporting standards appears to have been chosen almost by default, and with little known debate on the merits of monopoly and competition in this domain. The FASB often decides on such standards by a mere 4-to-3 simple majority vote (See Seidler [1990] for a complaint about lack of consensus in FASB decision making). As seen in Table 4, the four engineering standard setters use higher thresholds of support, even though none of their standards enjoy the monopoly status of financial reporting standards. Seidler ([1990]) wonders how any corporation could function if its board often had 4:3 votes and no clearly defined factions on the board.

3.4 Quality and Coordination Standards in the Public Sector

In order to get some data on co-ordination and quality standards we visited the websites of 80 Federal Government departments who were listed as having a standard setting function in the most recent edition of a U.S. Government publication of "Standards Activities of Organizations in the United States" (Toth 1996b). We recorded a brief summary of the type of standards being set by each agency (e.g., the Department of Agriculture sets standards for food and farm products including tobacco). The Toth ([1996b]) study provided data on: (1) Whether standards set by each agency were voluntary or mandatory for external users, (2) Whether the agency audits (certifies) entities who are governed by their standards, and (3) Whether the agency sets standards in-house or adopts private sector standards.

We also visited the website of each of these 80 Federal Government Agencies and attempted to find and download electronic copies of their standards. We were able to access copies of the standards for 64 Federal Government Agencies (80% of the sample). We examined the websites and/or the standards to determine whether the agency provides a minimum standard (Pass/Fail) or a series of grades (e.g., U.S. Prime Beef). We also coded the standard as to whether it was a quality standard or a co-ordination standard (in accordance with the definitions provided in Sections 2.3.1 and 2.3.2). We coded each agency in terms of whether its standards were economic (e.g., standards on weight and measures), scientific (e.g., meteorology / weather standards) or social/health related (e.g., standards for meat and poultry). Results are shown in Table 3.

Table 3 shows that thirty nine federal government agencies (61%) set quality standards versus twenty five federal agencies (39%) set co-ordination standards. Thus government agencies are marginally more likely to set quality standards (($\chi^2 = 3.06$, $p < 0.08$). Federal government agencies who set quality standards are more likely to conduct an audit (or certification) of users (done by 30/39 agencies (77%)) whereas federal agencies who set co-ordination standards are less likely to conduct audits (done by only 7/25 agencies (28%); $\chi^2 = 7.08$, $p < 0.01$). Agencies who set quality standards are also marginally more likely to adopt private sector input in setting standards (adopted by 28/39 federal agencies (72%)) than agencies who set co-ordination standards (done by 14/25 agencies (56%); $\chi^2 = 3.32$, $p < 0.07$). This result is driven primarily by the tendency of agencies setting scientific related standards to rely heavily on private standard setting organizations. As mentioned earlier, there is also a policy directive in the federal government to increase reliance on private standard setters in all areas of regulation (Toth [1996a]). In Canada the Canadian Standards Association (CSA) which is a government body that oversees standard setting activity, also has an explicit preference for standard setting to be done in the private sector.

Accounting standards are set in the private sector, but have some attributes normally found in government departments who set quality standards such as external audit and the participation of private entities in the standard setting process. This raises a question as to whether accounting standards are quality standards, co-ordination standards or a hybrid of the two and whether they should be set in the public or private sector.

Arguments made for accounting standards include elements of both quality as well as co-ordination. Disclosure standards tend to be regarded as pertaining to quality, with more disclosure being identified with higher quality financial reporting (Diamond and Verrechia [1991], Leuz and Verrechia [2000]). On the other hand, measurement standards, to the extent they are justified by the demand for comparability of financial statements, tend to be regarded as coordination standards (Sunder 1988). Their value arises more from the use of the same measurement method across firms, industries and economies and not so much from the specific method of measurement incorporated in the standard.

Such classification of disclosure and measurement standards as quality and coordination standards is approximate at best and should be used with considerable care. The quality of financial reporting is not monotonic in the extent or detail of disclosure for at least two reasons. First, it is possible for a reporting entity to disclose information at such a detailed (fine) level as to make it difficult for nonexperts, or even experts with scarce time and computational ability to understand the disclosure (too much disclosure can inhibit transparency). Enron, for example, disclosed in its financial statements information about some 3,000 special purpose entities. This magnitude of disclosure made it difficult for readers to understand the financial condition of Enron. Second, as Arya et al., ([2003]) show, greater transparency of reporting is not strictly better for shareholders (see Verrechia [1983] for a similar argument about proprietary costs associated with increased transparency). Subject to these reservations, we shall proceed by assuming that disclosure standards can generally be regarded as quality standards.

The actual practice of accounting is quite odd in its treatment of measurement issues versus disclosure issues. Measurement issues (which we have classified as being coordination standards justified by consistency and comparability) are the subject of extensive discussion and debate, subject to mandatory audit, and the cause of re-statements and SEC enforcement actions. Disclosure issues (which we have classified as quality standards), on the other hand are subject to much less regulatory debate, are only partly audited and more loosely audited[6], and are usually not the cause of re-statements and SEC enforcement actions. It is common in accounting debates to assert that good disclosure cannot compensate for inadequacies in accounting measurement (Schipper [2007]). The whole debate about inadequacies of lease accounting (FAS 13) can only be rational if the good and very extensive disclosure associated with classification of a transaction as an operating lease is considered to be inferior to measurement of the lease as debt on the balance sheet. Recent attempts to reform lease accounting (such as the G4+1 report – see Jamal and Tan [2007]) so that all leases get reported on the balance sheet indicates that both FASB and IASB are very concerned with measurement rather than disclosure. Likewise IASB has recently decreed that LIFO will not be considered an appropriate basis of inventory valuation (IASB [2005]).

Are measurement issues really co-ordination standards or quality standards? Can the conceptual framework help us to determine whether LIFO is a better or inferior method of inventory valuation vis a vis FIFO? Can the conceptual framework help determine whether goodwill should be reported on the balance sheet and never adjusted, amortized over 20 or 40 years, subject to an impairment test or immediately written off against shareholders equity (or comprehensive income)? It appears that many measurement issues in accounting debates are arbitrary choices (i.e., coordination standards) that cannot be rank ordered, especially not by reference to the conceptual framework (Joyce, Libby and Sunder ([1982]). Some thought needs to be given to whether any measurement standards can be justified as being better than their alternatives, and what the basis for determining better is in accounting measurement.

[6] Disclosures in the financial statements are subject to audit though there is some evidence that they receive less audit scrutiny (Libby, Nelson and Hunton [2006]). Much disclosure also occurs in venues like the MD&A which is not covered by the auditors report, though is subject to audit review for consistency with the financial statements. Managers are also given much more flexibility in generating disclosure, especially in MD&A where they can report from the perspective of management. Measurement standards are much more prescriptive.

3.5 Comparison of Standard Setting Processes

It is quite common in the economy to have competing SSOs whose jurisdiction overlaps (see Jamal, Maier and Sunder [2003]). We examine the processes used by four SSOs whose standard setting domain partially overlaps, especially with relation to internet telephony (which is the subject of a case study in Section 4 of this paper). The four SSOs are Internet Engineering Task Force (IETF), Institute of Electrical and Electronics Engineers (IEEE), Alliance for Telecommunications Industry Solutions (ATIS), and International Telecommunication Union (ITU). Details of the standards setting processes of these organizations are obtained from their websites, as well as from Bradner ([2006]) and Nickerson and Muehlen ([2005]). Table 4 presents a comparison of the standard setting process of these four SSOs and FASB. All of these SSOs have elaborate processes for initiating standards, engaging a diverse set of participants and various quality control and editorial processes. We make the following comparative observations from Table 4:

Number of Standards: Consistent with results reported previously, the FASB has the least number of standards (159 standards and 12 working groups) of the five SSOs, whereas the IETF has the largest (4,500 standards and 124 working groups).

Government Participation and Sanctions: This runs the gamut from complete government dominance (e.g., ITU) to no government involvement (e.g., IETF). IEEE and ATIS exhibit a mix of government and private involvement in standard setting, as does the FASB. FASB is the only body whose standards are formally backed by law. FASB is also the only SSO whose standards are subject to mandatory audit and formal government sanctions for non compliance. IEEE has a provision for obtaining voluntary certification of standards compliance, whereas there is no formal certification or sanctions process for the other three SSOs. In accounting, mandatory audit requirement and enforcement are considered to be necessary for the proper functioning of accounting standards (e.g., Ball et al [2003]; Bushman and Piotroski [2006]). It is not the norm in the economy for standards to be enforced by government sanctions (even for quality standards) and there is little evidence that compliance with accounting standards is any better than compliance with standards set in other parts of the economy not enforced by law (see also Jamal, Maier and Sunder [2005]).

Financing: The FASB is financed primarily from a tax levied on publicly traded companies. This tax authority comes from SOX. All the other SSOs rely primarily on fees levied on entities (individuals, companies or governments) who are direct participants in the standard setting process. The FASB also relies on publication sales for a significant part of its budget (33 percent), whereas SSOs like IETF provide all their standards publicly on the internet with no fee and no publication related revenue; they are financed primarily by membership dues and volunteers.

Standards Adoption Threshold: FASB and ATIS use a simple majority threshold for adopting a standard, ITU requires 70 percent, IEEE has a 75 percent threshold, and IETF has no formal voting, just a process to ascertain “rough consensus.” IEEE has two distinctive elements as compared to the other SSOs namely, potential for a company to capture a standard setting committee by stacking its membership, and a 5 year sunset clause that cause all standards to face an automatic review or lapse.

Standards Competition: FASB is the only SSO which has no provision for standards competition and does not allow issuance of more than one standard for a particular issue. All the other four technology related SSOs allow the possibility of more than one competing standard to be adopted by the SSO. In addition, the standards of these four SSOs also compete with each other (see Section 4 for a case study of such competition across SSOs). IEEE and ATIS sponsor periodic Olympic type competitions where sponsors bring their products and take part in a competition where the winner becomes the standard. IETF requires two independent practical operationalizations to be developed for each proposed standard before a standard can be adopted. FASB is the only SSO which has no routine field testing of standards prior to their adoption.

In Fall 2007, the Securities and Exchange Commission (SEC) has issued a call for comment on allowing foreign issuers to use International Financial Reporting Standards (IFRS) in the U.S. IFRS are set by a rival International Accounting Standards Board based in London, U.K. The SEC also has a concept release seeking comments on allowing U.S.public companies to use IFRS as well. If these changes are made, FASB will have a competitor in the U.S. market for the first time since advent of the Securities laws of 1933 and 1934.

4.0 Competition in Standard Setting

Each industry in the U.S., from aerospace to wood products, is subject to standards set by multiple sets of government, domestic private and international SSOs (see Figure 4). Some industries (e.g., construction and fire safety) have to comply with standards set by over 100 government and private SSOs. The data in Figure 4 show that the existence of multiple (government, private, and international) standard setting bodies is the norm in the economy. An argument could be made that accounting also has a myriad of competing SSOs. In the U.S. we have the FASB, but also the government accounting standards board (GASB), the AICPA, the SEC, various state accounting boards, treasury associations and industry specific accounting pronouncements, research studies and a host of other sources of guidance (standards) on GAAP. Likewise there are national accounting SSOs in a variety of countries as well as the IASB. The attempt to set up one dominant global accounting standard setter (e.g., see Dye and Sunder [2001], Sunder [2002]) is also not unusual given similar debates in many other areas of the economy (e.g., chemicals, textiles).

What is unusual in accounting is the development of a GAAP hierarchy (SAS 69). SAS 69 mandates a hierarchy of GAAP sources with written FASB pronouncements at the top of the hierarchy. In countries like Canada, which have previously had a "professional judgment override" to allow professional judgment, imposition of a GAAP hierarchy (in Section 1100 of the CICA Handbook) was explicitly linked to removing the professional judgment override (Jamal and Tan [2007]). Accounting, tax and the law seem to be the only domains where a hierarchy of authoritative sources is specified in writing, and enforced by mandate. We are not aware of any other area in the economy where a hierarchy of authority is mandated and enforced by law.

4.1 Case Study of Internet Telephony

"The internet is the service"

- Jon Peterson (area director of IETF)

The conventional telephone provides global connectivity to users. Anyone with a phone can dial a number and reach anyone on the planet who has a phone and increasingly even a computer. This need for connectivity indicates that the main value of a telephone comes from the network to which it is attached. The need for inter-connectivity also makes telephone systems very complex. The conventional phone works on a Public Switched Telephone Network (PSTN). A PSTN is a Time Division Multiplex (TDM) circuit switched network that transmits primarily conversational speech and other low speed (at 64kb/second) data such as fax and computer connections with modems. Circuit switched networks create and maintain a circuit between two points for the duration of the event. Their advantage lies in the flexibility of transmission paths created for specific events as compared to fixed circuits used in earlier technologies. A circuit switched network can be made more intelligent and digitized to provide a wider range of services at a faster rate. One example of such an intelligent network is an integrated service digital network (ISDN). These networks were envisaged and supported by a variety of standards created by the International Telecommunications Union (ITU) standard setting body. Standards are required to transport audio, video and textual data, and provide new services such as mobility, conference calls, voice mail and universal phone numbers. Signalling protocols are especially important for transmitting voice, video and data across a network.

Despite investments of billions of dollars by telephone companies in building safe and reliable PSTN circuit switched network, telephone services are rapidly migrating to the internet, and using standards developed by the Internet Engineering Task Force (IETF) which are packet based as opposed to circuit based. In contrast with circuit switched networks, packet switched networks neither create nor maintain a circuit path between terminals. Instead, the data transmitted is divided into small packets and each packet moves independently from origin to termination before being reassembled and presented to the recipient as an integrated message. The case study seeks to explore how a standard setting body with no government backing, and no ability to coerce users to use its standards (no threat of sanctions) came to dominate the telephone industry and induced its migration towards the internet.

Background

Circuit Switched Network Telephone Model

The PSTN network features a circuit switched architecture (Goralski and Kolon. [2000]). Key features of this architecture are: (1) Central control over paths in a network. Media and signalling are handled by gateways. Independent developers cannot get access to the central control platforms or influence the interface standards; (2) Telecom standards focused on interfaces such as user to network interfaces (UNI) and network to network interfaces (NNI); (3) No service intelligence / choice in user devices. Users have no control over choice of service, except for services made available by the service provider (e.g., local telephone company); (4) Need to keep state for a connection or all in every switch as well as in the central control unit. This requires memory and processing in all network components; and (5) There are single points of failure requiring carrier grade equipment and standby equipment.

The ITU-T H.323 Standard.

For IP telephony, the main signalling standard created by ITU-T is H.323. This standard was initially developed for multimedia conferencing over local area networks. H.323 describes protocols for multimedia communications to occur among terminals, network equipment and services and was first issued in 1996 (V1), followed by revisions in 1998 (V2), 1999 (V3), 2000 (V4), 2003 (V5) and 2006 (V6).

ITU's standard setting process is divided into three sub-sectors with the telecommunication sector (ITU-T) being responsible for setting international networking standards including asynchronous transfer mode (ATM) and integrated service digital network (ISDN). ITU standards are designated by a letter, followed by a number. Each letter designates a specific area of technology. For example, the letter H deals with audiovisual and multimedia systems including voice over internet protocol (VOIP).

In order to support such a variety of media types, an H.323 system may consist of several different components:

- Terminals**:** a network endpoint (e.g., a phone) which may provide audio, video, or data communications with another terminal.
- Gateways**:** Provides connections for call setup, control and media coding which provides access to terminals on a circuit switched network (such as the PSTN).
- Gatekeepers**:** a network function that provides address translation, access control, bandwidth management, and other management operations for a network.
- Multipoint Control Units**:** a network function that enables tele-conferencing.

H.323 is a meta standard[7] under which the various VOIP standards fit rather than a specific standard (Goralski and Kolon, [2000]). All it requires is a packet based network interface. Given that the standard was set by committee T (which also has responsibility for circuit switched ISDN and ATM networks) it is not surprising that the standard was designed for LAN type environments, public X.25 type packet networks, and layer ATM networks with a circuit switched network. The migration of telephony to the internet means very little traffic now goes over the type of networks H.323 was originally designed for. H.323 was designed for audio communications, as well as video applications (e.g., teleconferencing) and data conferencing(e.g., file transfer). H.323 was also tightly coupled with other telecommunication standards issued by ITU-T.

[7] H.323 works with a set of other ITU protocols such as H.245 media control, H.225 for call set up and establishment between endpoints, H.323 for large conferences, H.450 for supplementary services, and the Real Time Protocol (RTP) for transport. A detailed discussion of the protocols and standards used for IP Telephony under both the ITU-T's H.323 protocol and the EITF's Session Initiation Protocol (SIP) can be found in Chapter 7 of Goralski and Kolon (2000).

H.323 can be used on a local area network (LAN), or any wide area packet network. H.323 capabilities can extend across a Wan where a gateway handles the Wan links. H.323 can also be used with the PSTN, a narrowband ISDN network (N-ISDN) or a broadband ISDN (B-ISDN) network employing ATM. H.323 can be used to transfer video, audio, and data. Only a subset of H.323 is needed for IP telephony. The audio and control portions of H.323 are used in IP telephony with related audio protocols (G.711, 723, and 729) and control protocols from ITU such as H.225 and H.245. The video and data transfer protocols of H.323 are not needed for IP telephony. H.323 defines the roles of terminals and gateways, the end points of an IP telephony system. These mark the origin and the terminus of the IP portion of a voice call. These end points are the interface where a voice signal gets converted into IP packets (beginning), and the point where IP packets are re-converted back to voice. Several audio protocols (G series) are used to convert analog audio signals into digital signals. The minimum requirement for an IP call is ITU-T G.711 protocol which uses pulse code modulation (PCM) as a technique for digitizing voice signals into a stream of 64 kb/s packets. Other G series protocols (722, 723, and 729) provide more efficient coding.

Implementation of H.323 requires adoption of two other control protocols from ITU-T: H.225 (call signalling protocols and media stream packetization for packet based multimedia communications systems), and H.245 which processes non telephone signals and is used to negotiate channel usage and capabilities. H.225 also covers a much wider range of applications than just audio. H.225 (and H.245) are used to establish and terminate calls.

Packet-Switched Network: The Competing Session Initiation Protocol (SIP) Model

The session initiation protocol (SIP) was developed by the Internet Engineering Task Force (IETF). For many years, the IETF proposed to ITU-T that the underlying web protocol TCP/IP should be adopted as an international standard. However, the ITU-T was wedded to a circuit switched telephone model (the telephone companies had invested billions of dollars to develop such models) and refused to adopt TCP/IP as an international standard (Goralski and Kolon [2000]). The IETF then decided to move on its own to develop a competing model for IP telephony. The first SIP standard was issued in 1998 (RFC 2543) followed by a revision in 2002 (RFC 3261). Key features of this decentralize model are:(1) No central control over the network. SIP works in a de-centralized (web) environment; (2) Intelligence is embedded at the end points with a dumb network in between. Internet standards are focused only on protocols specifying how devices communicate over the net and not interfaces; (3) Connects well with the web and e-mail. Easy for people to program new features and tailor services to individual clients; (4) A SIP network server is not required to be stateful even for the duration of a transaction. This reduces need for memory and processing in all network components; and (5) There is no single point of failure, transparency of applications and complete control by users over applications and selection of services.

The circuit switched network made a high quality telephone system with global connectivity possible. However, SIP seems to be a robust packet-switched challenger which is not wedded to a circuit switched environment. The web orientation of SIP enables a much broader range of functions including multi-player games, bank transactions, mobility, yet keeping the simplicity, scalability and extensibility principles as well as ease of programming and debugging.

Signalling Protocols for Session Initialization Protocol (SIP)

The Session Initiation Protocol (SIP) is a signalling protocol used for establishing and controlling multimedia communication sessions (e.g., a phone call or a videoconference) on networks that use the Internet Protocol (IP). SIP was primarily designed to establish, modify, and terminate sessions, and therefore has no information about the details within a session. This simplicity makes SIP quite scalable and extensible, and it can be used easily in different architectures and deployment scenarios. SIP is modeled after the simple mail transfer protocol (SMTP) used for e-mail, and the hypertext transfer protocol (HTTP), the protocol that runs the web. SIP uses much of the architecture of HTTP making it easier to code and debug. SIP relies on the Session Description Protocol (SDP -

which is also an IETF standard) to carry out a control function similar to H.245. SDP also interfaces with the Real Time Signaling Protocol (RTSP) to negotiate channel usage.

The SIP architecture defines two main devices: clients and servers[8]. A *client* is described in RFC 3261 as a network element (e.g., a SIP phone) that sends SIP requests and receives SIP responses. Similarly, the *server* is a network element that receives requests in order to service them, and then responds to those requests. Thus, the foundation of well-known and extensively implemented Internet protocols, such as HTTP, plus the client/server architecture, provides SIP with a degree of simplicity that many feel is superior to the complexities found in H.323. This client/server operation, modeled on the HTTP request/response paradigm, is one of the major strong suits of SIP. The control function of SIP (using the SDP protocol) appears similar to that of H.323 but is fact much simpler to implement because no central server is required to set up a session. For example, the calling party would send an INVITE message to the called party to initiate the session, who would respond with Ringing and OK messages. The calling party would then return an ACK (acknowledgement) message, which would complete the connection, and allow information to be exchanged between the two parties. When the connection is no longer required, one party sends a BYE message, with an OK message returned in response, thus terminating the call.

SIP is seen by some experts as being equivalent in functionality to H.323 (e.g., Goralski and Kolon, [2000]). However, others see SIP as having several significant advantages such as less cost, less complexity (simplicity), less need for memory and processing capacity, and more scalability, extensibility and modularity (Schulzrinne and Rosenberg [1998a, b]). A further advantage of SIP is that the IETF is more nimble than ITU-T as a standard setting organization and doesn't have to go through a slow and deliberate process to seek complete consensus that ITU as a quasi government organization has to do. IETF can focus more on technical elegance and less on politics.

[8] Due to the wide usage by legacy systems of H.323 protocol, SIP Gateways connect to PSTN or other H.323 networks as well.

What is clear is that SIP is based on a completely different (web based) architecture; it is not just an extension of a circuit switch network. What is also clear is that SIP has helped move the entire telephony industry towards the web. As the effect of legacy PSTN networks weakens with time, it is a fairly safe prediction that in the future all telephony will run on the web (or its future re-incarnation) and not on circuit switched networks.

The Benefit of Competing Standard Setting Bodies

The ITU-T standard setting body has developed a good track record of setting international standards using a framework where a new standard is defined for each feature, and then a set of features are integrated into a meta-standard like H.323. This creates a complex framework where addition of each new feature requires adjusting the definition and operation of all existing features. Despite these complexities, the ITU-T standardization body has been an effective global standard setter who responded on a timely basis to changes in technology over many decades. The PSTN developed and assisted by ITU-T standards is widely regarded (even by its critics) as being reliable, providing good voice quality, minimal delay and worldwide coverage.

Yet it turns out a better alternative was available, but not pursued by ITU-T. Given its historical legacy (and billions of dollars invested in the existing system by telecom companies), it is highly doubtful that ITU-T and the telecom industry would have ever made the leap to an internet infrastructure without the presence, competitive pressure and insight of IETF. The shift of telephony to the internet is not an isolated process. It builds on an internet standards infrastructure developed over many years by IETF. In the absence of this standards infrastructure, it would not have been possible to migrate the telecom industry to the internet.

The IETF pursued internet telephony as a matter of ideology with a commitment to using the internet and its emphasis on having the control reside at the end points instead of at a central server. SIP defines primitives that a system can support instead of features (as in H.323). This focus on features (and being content neutral) makes it easy for SIP to add new features and new devices (not just phones). This philosophy of no central control appears to be very powerful as telephony increasingly is being driven by P2P networks (e.g, skype, google talk). The use of the internet helps with simplicity, scalability, better able to use intelligent devices and deal with presence, mobility, P2P and instant messaging. Many of these new services were not even envisioned when a small number of researchers involved with IETF began to develop protocols for routing telephone calls over the internet. There is also the added advantage of low cost. Under a traditional intelligent phone network, only the phone company could add new features, and upgrading the (intelligent) network was slow and costly. In a distributed internet environment, it is much easier to add new services without needing to upgrade the entire network. The attitude and success of IETF is the exact opposite of the FASB. The FASB (Like ITU-T) is wedded to a centralized, control and command type of standard setting model.

At present, we have a legacy PSTN circuit switched telephone system based on centralized control, co-existing with an internet (packet) based de-centralized system. All indications are that the future belongs on the internet, and not in centrally controlled circuit switched networks. The presence of ideologically competing SSOs has been a key requirement for creating competing sets of telephony standards. The presence of competing SSOs has been a key factor in leading the development of this transformational technology.

5. Discussion and Implications for Accounting Standard Setting

The broad survey of standard setting practices in the U.S. economy presented in this paper raises several important issues regarding accounting standard setting. First, most industries have multiple competing SSOs with overlapping jurisdictions (see Figure 4, Table 4 and the case study in Section 4). A monopoly in standard setting may exist in some domains, but it is not the general rule. While we cannot rule out the possibility that there exist valid arguments for allowing a monopoly SSO for accounting, such arguments remain to be made, analyzed and defended.

The FASB is pursuing a convergence project with IASB in order to eliminate what little diversity and competition survives in accounting standard setting. The oft-repeated argument for monopoly and convergence is uniformity and comparability of financial statements across companies (and countries). This is a co-ordination (and not a quality) argument. For the industries listed in Figure 4, co-ordination demand for standards would hardly appear to be less than co-ordination demand in accounting. Yet most industries, including financial industries[9] flourish with multiple standards. It is often feared that competition among accounting standards will start a race to the bottom and degrade the quality of financial reporting (Dye and Sunder [2001], Sunder [2002]). With pervasive evidence of standards competition in all parts of the economy (see also Jamal, Maier and Sunder, [2003]), this fear appears to be misplaced unless better theory or evidence to the contrary can be developed.

A government backed monopoly must at least appear to be responsive to demands of various constituencies and thus adopt an elaborate due process method that slows down standard setting (Cheit [1990]). FASB has an elaborate due process model, and the appearance of engaging diverse constituencies but little actual participation from preparers, auditors and users of financial statements. We have lost the notion of "generally accepted" in accounting. The level of engagement of the engineering community in standard setting that we document in the voluntary participation in IETF standard setting groups, is inconceivable in accounting today.

Competing private standard setters have incentives to be innovative and to carve out a clientele rather than trying to please all constituencies (see Jamal, Maier and Sunder, [2003] for an example in e-commerce privacy). Monopolies are seldom known to be innovative. Especially when backed by government they are slow in responding to changes in the environment due to extensive due process requirements. The data on standard setting in the private sector suggests that FASB is too reticent, rather than too prolific in setting standards. This lack of responsiveness and timeliness is especially

[9] In the regulation of financial services, competing standards are set by stock exchanges, bond rating agencies, state corporate charter laws, and state and federal bank regulatory authorities.

troubling in accounting where a financial engineering industry creates transactions and structures to evade the substance of accounting standards (e.g., the structuring of leases, preferred shares and special purpose entities). For example, in the case of lease accounting, a G4+1 country[10] group study issued a report (Nailor and Leonard [2000]) in response to concerns about abuse of the lease accounting standard (FAS 13). The G4+1 report recommended a change in the leasing standard whereby all leases should be reported on the balance sheet (with no tests or bright lines). Yet seven years later in fall of 2007 there has still been no new lease standard and the FASB and IASB are still studying the recommendations of the G4+1 report. A competing set of accounting standard setters are likely to be more responsive to changes in financial engineering, and respond more quickly to abuses in implementation of the standards set. Despite intense regulatory pressure after the Enron scandal (and legal reforms such as SOX), a large amount of corporate debt continues to be reported off balance sheet due to loopholes in the lease accounting rules.

The current accounting standard setter (FASB) does not have to be doing poorly in order to develop a case for allowing regulatory competition in accounting. By most accounts the subject of the case study in Section 4 (the ITU) has been a highly successful and good standard setter. The ITU's standards had created a reliable and global telephone system. By many measures it was a great success. The ITU had 191 fee paying countries as members (good global participation), a long history (formed in 1863), high quality standards (you could get a good voice phone reception all over the world), and a reliable technology that responded to changes in the environment (the circuit switched network, and the ISDN network for internet and high speed access).

Yet it turned out that an alternative (packet switched) architecture was possible with lower cost and easier integration with the internet, instant messaging and peer to peer communities and models. The switch in the telecom industry from a circuit switched network to a packet switched network was

[10] The G4+1 Group are the accounting standard setting bodies of Australia, Canada, the United Kingdom, New Zealand and the United States. The IASB was an observer in this process.

facilitated by the presence of a competing standard setter (IETF) that had no official government support, no threat of sanctions, and no ability to compel companies to use its standards. The IETF was successful because it had a different model for conceiving of network communication services, not because it was trying to harmonize with the ITU's model of telephone services. The simpler decentralized protocol for network communications has made proliferation of new internet devices and services which were not even conceived of by those who developed the new system. This begs the question why must there be only one model (or only one conceptual framework) for development of accounting standards? While some regulatory oversight over accounting standard setting might be desirable, the current approach of relying on a monopoly and pursuing harmonization of accounting standards appears to have little support in theory or empirical evidence. Some rethinking of this approach might be warranted.

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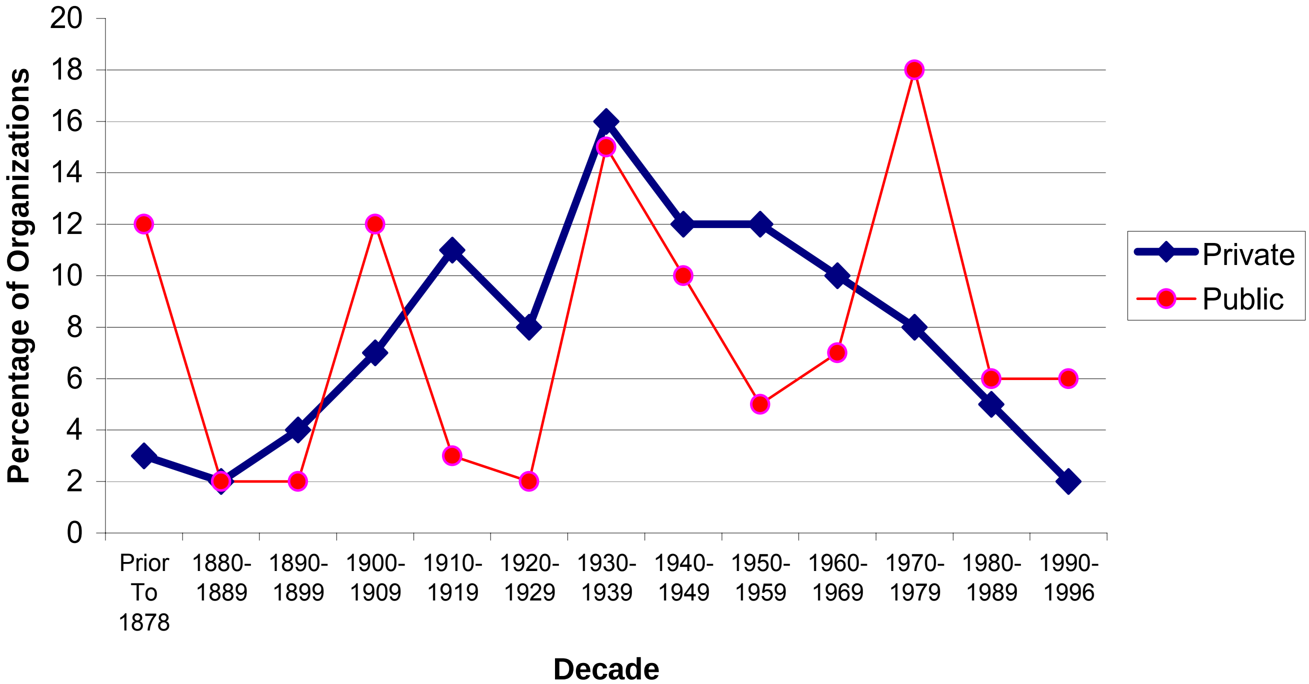
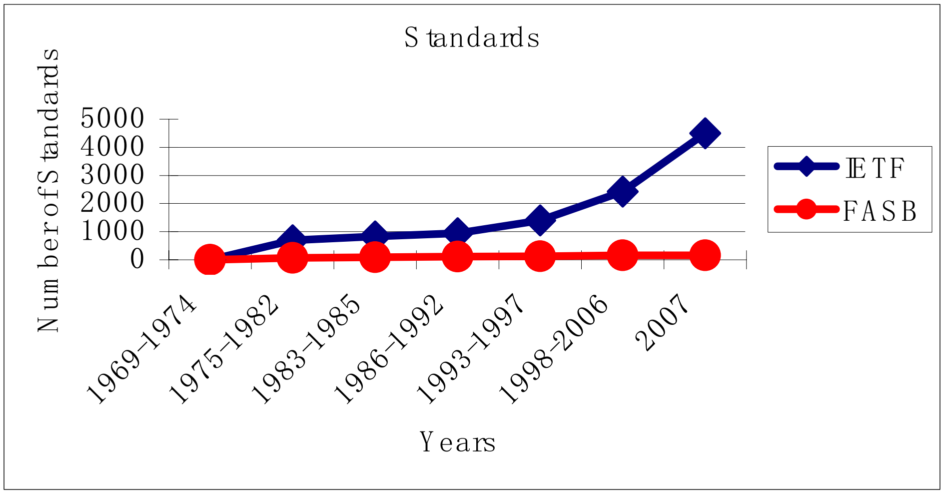
Figure 1
Formation of Private and Public Sector Standard Setting Organizations in The U.S.



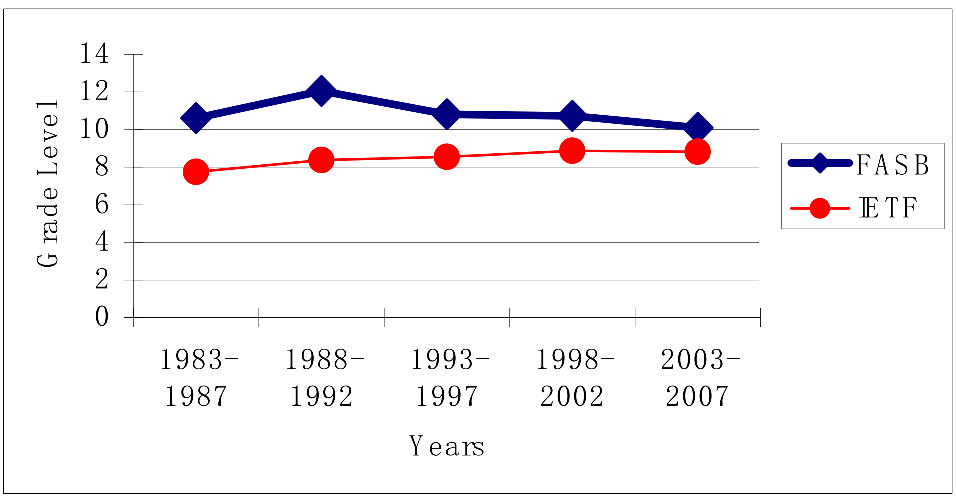
The U.S. government (Commerce department) collects and publishes information on standard setting organizations in the U.S. in both the private and public sector (see Toth [1996b]). The graph shows the % of standard setting organizations formed in the public sector (N=80) and private sector (N=604).

Figure 2
Standards Overload in Accounting

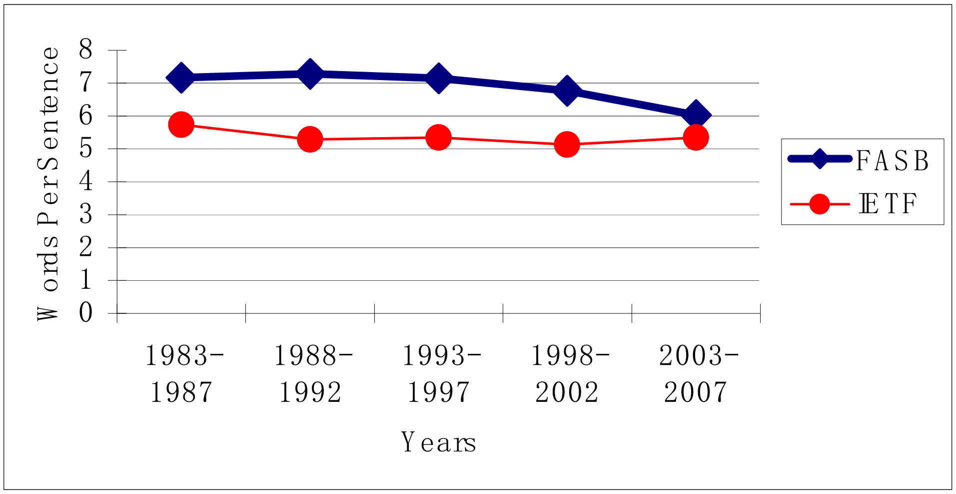
Panel A. Number of Standards Issued



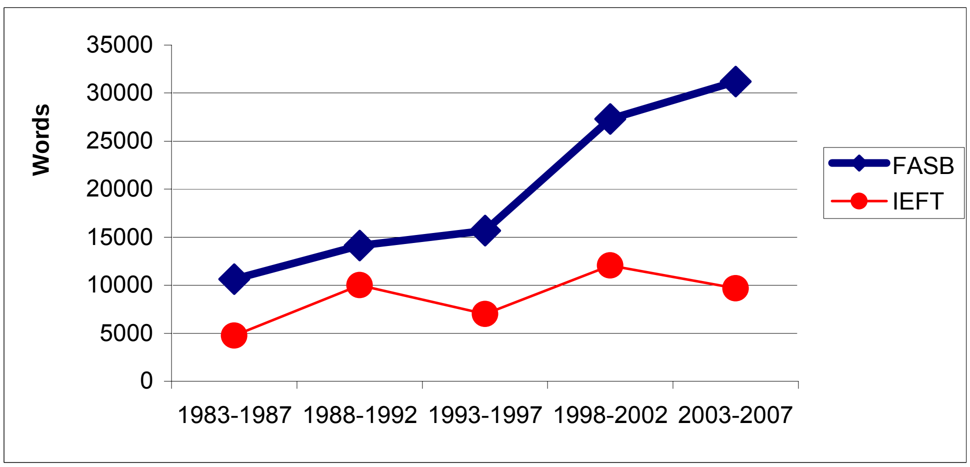
Panel B. Complexity of Standards: Flesch-Kinkaide Reading Level



Panel C. Complexity of Standards: Average Number of Words per Sentence



Panel D. Complexity of Standards: Average Number of Words per Standard

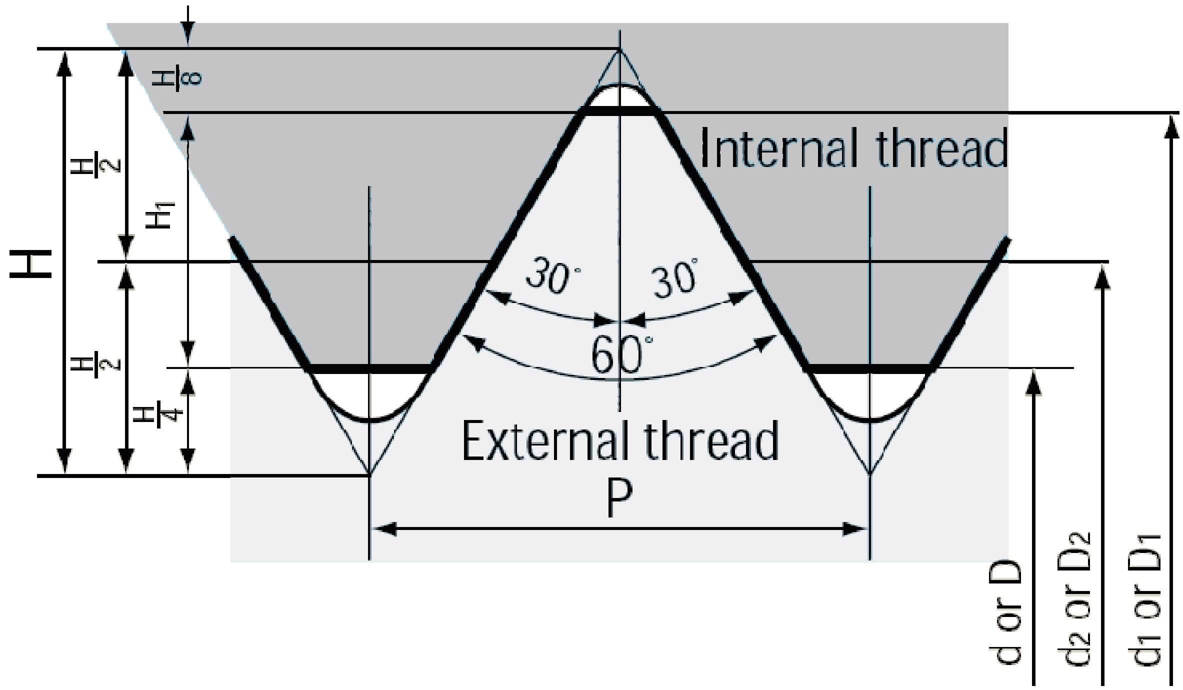


An electronic copy of 159 standards issued by FASB, and a matched sample of 159 standards issued by IETF were obtained from their respective websites. The standards were then analyzed for complexity by counting words, syllables, sentences and words per sentence. A Flesch-Index reading complexity of the text was computed to calculate the amount of education (grade level) required to understand a piece of text. The reading grade level was calculated using the following formula:

$$0.39\left(\frac{\text{total words}}{\text{total sentences}}\right)+11.8\left(\frac{\text{total syllables}}{\text{total words}}\right)-15.59$$

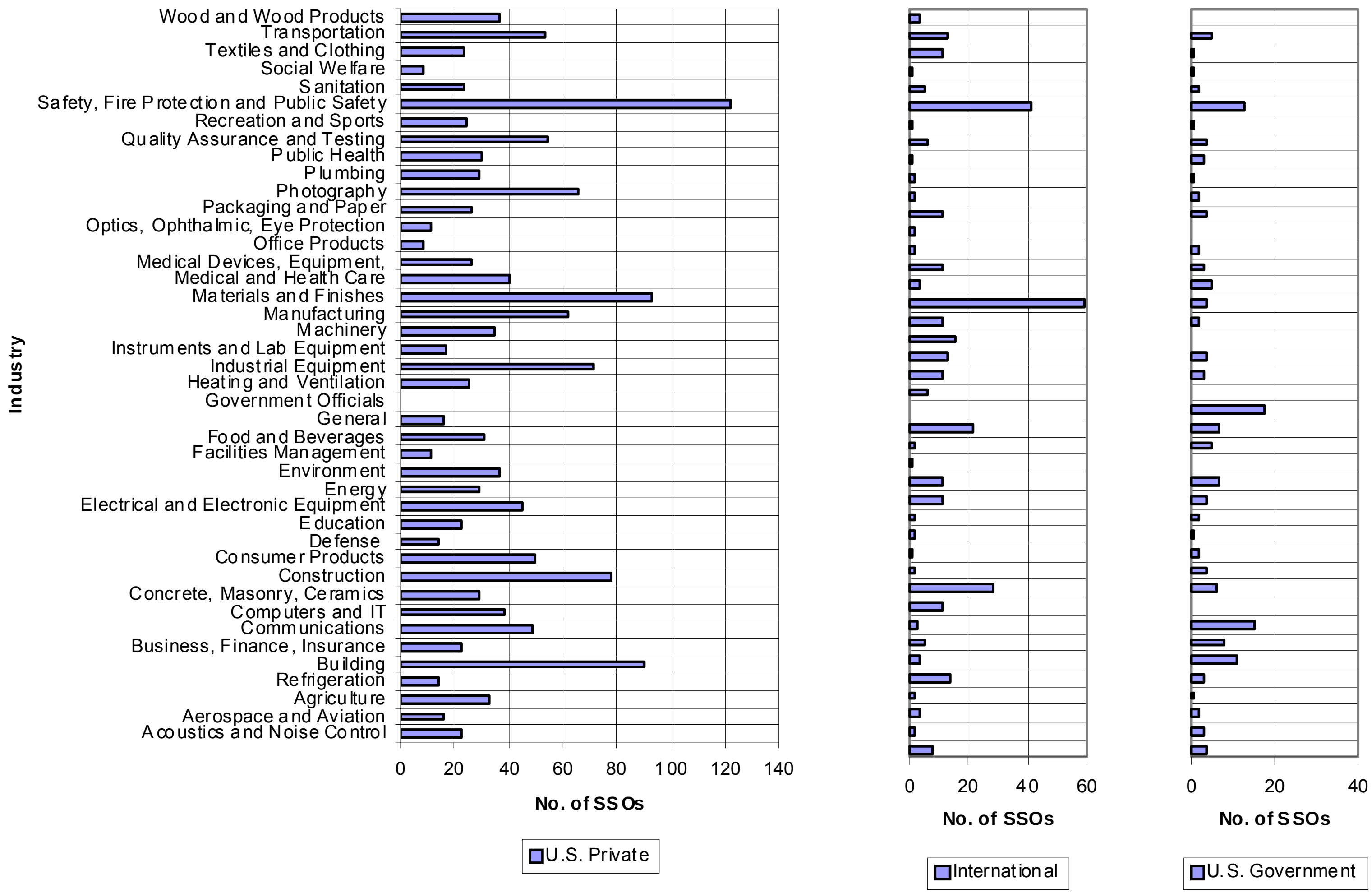
Figure 3: Unified Thread Diagram

(Downloaded from http://en.wikipedia.org/wiki/Unified_Thread_Standard on February 25, 2006)



Pitch = 1 / *TeethPerInch* *H* = 0.866025 * *P* *H*1 = 0.541266 * *P* *d*2 = *dimeter* − 1.082532 * *P* *d*1 = *dimeter* = 1.082532 * *P* *D* = *d* *D*1 = *d*1 *D*2 = *d*2

Figure 4: Number of US and International Standards Organizations by Product Line (1996)



Footnote to Figure 4: The U.S. government (Commerce department) collects and publishes information on standard setting organizations in the U.S. in total and by industry (see Toth [1996b]). Data on International Standards Organization (ISO) activity is obtained from the ISO website. The numbers under the column international reflect the number of ISO technical committees. All ISO standards are voluntarily reviewed every 5 years to decide whether they should be maintained, updated or withdrawn. As of July, 2004, there are 2850 ISO active technical groups (technical committees, sub-committees, working groups) in which 30,000 experts participate annually to develop ISO standards

Table 1

Number of Standards In The United States

	1967	**1984**	**1991**	**1996**
Government	39,500	49,000	52,500	44,000
Private	14,000	32,000	41,500	49,000
U.S. National Standards	**53,500**	**81,000**	**94,000**	**93,000**
ISO Standards	650	5,692	8,205	10,745
Total Standards	**54,150**	**86,692**	**102,205**	**103,745**
FASB Standards	0	82	108	127
IASB Standards	0	1	4	8

The U.S. government (Commerce department) collects and publishes information on standard setting organizations in the U.S. and the number of standards issued by these organizations (see Toth [1996b]; Toth [1991]; Toth [1984]; and Hartman [1967]). Data on International Standards Organization (ISO), Financial Accounting Standards Board (FASB), and International Accounting Standards Board (IASB) activity is obtained from their respective websites.

Table 2: Number of Standards Issued By The Top 15 Private Standard Setters In The U.S.

Rank	Name	Founded	1984	1991	1996
1.	American Society For Testing and Materials	1898	7200	8500	9900
2.	US Pharmacopeial Convention	1820	2900	4450	5000
3.	Society of Automotive Engineers International	1905	4200	5100	4550
4.	Aerospace Industries Association	1919	2800	3000	3000
5.	Association of Official Analytical Chemists International	1884	1500	1900	2100
6.	American National Standards Institute	1918	1330	1100	1500
7.	Association of American Railroads	1934	1350	1350	1400
8.	Electronic Industries Association	1924	480	600	1300
9.	American Association of State Highway and Transit Officials	1914	176	1100	1100
10.	Cosmetics, Toiletry and Fragrance Association	1894	630	800	800
11.	Underwriters Laboratory	1894	465	630	780
12.	American Conference of Government Industrial Hygienists	1938	500	700	750
13.	Institute of Electrical & Electronics Engineers	1884	500	575	680
14.	American Society of Mechanical Engineers	1880	550	745	600
15.	American Petroleum Institute	1919	350	880	500
	Total Standards Issued By Top 15 Private Standard Setting Organizations	-----	24,931	31,430	33,960
	Standards Issued by Top 15 Standard Setters as a % of Total Private Standards In The U.S.	-----	78%	76%	69%

The U.S. government (Commerce department) collects and publishes information on standard setting organizations in the U.S. and the number of standards issued by these organizations (see Toth [1996b]; Toth [1991]; Toth [1984]). These data reflect just the total number of standards issued on the dates indicated in the Table.

Table 3: Quality and Co-Ordination Standards in the Federal Government

	Quality Standards		Co-Ordination Standards		
	Voluntary Standards	**Mandatory Standards**	**Voluntary Standards**	**Mandatory Standards**	**Overall**
Audit	**6/7 = .86**	**24/32 = .75**	**2/5 = .40**	**5/20 = .25**	**37/64 =.58**
Private Standards	**5/7 = .71**	**23/32 = .72**	**3/5 = .60**	**11/20 = .55**	**42/64 =.66**

Standards set by 64 U.S. federal government agencies were examined and coded as to whether they were quality standards (could be ranked in terms of quality for example, grades of grain), or whether they were co-ordination standards.

Standards were also coded as:

1. Being mandatory if entities covered by the standard are required to follow the standards by law, otherwise they are voluntary

2. Covered by audit if the agency setting the standard also carries out an audit or inspection (or authorizes private entities to carry out an inspection), and

3. Involves the private sector in the standard setting process if private entities are represented on the standard setting body or consulted and have formal input as part of the standard setting process.

Table 4: Process Description of Five Standard Setting Bodies in U.S. (May 22, 2007).

Standard Setting Organization (SSO)	**Financial Accounting Standards Board (FASB)**	**Internet Engineering Task Force (IETF)**	**Institute of Electrical and Electronics Engineers (IEEE)**	**Alliance for Telecommunications Industry Solutions (ATIS)**	**International Telecommunications Union (ITU)**
Scope of Standards	Financial Reporting (GAAP)	Internet: Above the wire and below the application (e.g., IP, TCP, e-mail)	Aerospace, telecom especially networking electric power, consumer electronics , Internet	IT In Telecom Industry such as Plant Infrastructure, Wireless, Multimedia, Optical and Packet Based Networks	International (UN) body where governments and the private sector co-ordinate global telecom network standards
Year Formed	1973 Predecessor bodies : CAP 19391959 and APB 1959-1973	1986 Predecessor Body: Arpanet 1969	1963 Predecessor Bodies merged in 1963: AIEE formed 1884 and IRE formed 1912	1993 Predecessor body: Exchange Carriers Standards Association (ECSA) 1983-1993	1865
Working Groups	12	124	102	24	14
No. of Standards	159	4,500	900	3000	3100
Government involvement	Yes – Private SSO, but standards required by law	No	Yes – Sets private and government backed (ANSI) standards and works with ITU	Yes – Sets private and government backed (ANSI) standards and works with ITU	Yes – UN body of National (Government) Standard Setters Governments co-ordinate private groups to create national standards
Works with Partners	Yes – Partners with other accounting standard setters	No	Yes- sets up formal partnership agreements with other SSOs	Yes- sets up formal partnership agreements with other SSOs	Yes- partners with Government and Private SSOs in member countries
Sanctions For Non-Compliance	Yes from SEC / Government. Auditors certify compliance	No	No – though companies can provide certificate of compliance	No	No

Governance					
Selection of Directors	The seven (paid) members of the FASB are chosen by the Financial Accounting Foundation (FAF). FASB Members required to be Independent	Ten volunteers randomly chosen from a pool identified by nominating committee. No more than 2 volunteers may have the same company affiliation. The community can challenge selection of a volunteer	The voting membership of the IEEE elects annually officers that serve on the top-tier IEEE governing bodies. IEEE Board of Directors selects the candidates for the office of President-Elect based on recommendations from the IEEE Nominations and Appointments Committee (N&A) and nominations from the floor at its November meeting.	The election of leadership is by a simple majority of the Forum or Committee Funding Companies in good standing and present at the time of election; each has one vote.	Plenipotentiary Conference elects the Secretary-General, Deputy Secretary-General and the Directors of the three Bureaus
Nominating Committee	FAF appoints board members for five-year terms and are eligible for re-appointment to one additional five-year term. Government body (SEC) consulted on appointments	Nominating Committee (NomCom) appoints members to Internet Architecture Board (IAB) and Internet Engineering Steering Group (IESG) for 2 year terms, with half of each group being replaced each year	All slate of candidates must be received by the IEEE Board of Directors by 15 March of the year of the election. On 1 May, the Board of Directors submits to the voting membership a list of nominees to be elected by voting members for the coming term	Nominations shall be solicited from the appropriate electing body following an election announcement. Nominations shall also be sought from the floor at the time of the election.	Maximum of 25% of the Members States, which are elected by the Plenipotentiary Conference with due regard to the need for equitable distribution of Council seats among the five world regions
Appointment of Area Directors	3 full time staff members	NomCom	Yes- Regional (Divisional) nominating committees submit names of candidates for the offices of Regional (Divisional) Delegate-	No	Yes-Council seats among the five world regions (Americas, Western Europe, Eastern Europe, Africa, Asia, and Australasia).

			Elect/Director-Elect		
Removal of Directors	No Process	20 members of IETF community can sign petition to recall any IAB or IESG member	affirmative vote of two-thirds of the votes of the members of the appointing body present at the time of the vote, provided a quorum is present, to remove Board or Committee member	A Forum or Committee may agree by consensus to remove leaders.	By Plenipotentiary Conference
Paid Employees	Seven FASB members and 68 FASB staff	Area Directors (AD), IAB Members and clerical staff	three top-tier IEEE Executives, 6 Major Boards, 23 committees and approximately 900 employees	ATIS professional staff and Board members	822 people from 80 different countries
Membership	No direct members	20,000 Individuals and 100 Organizations	370,000 members in 160 countries	300 Corporate Representatives	191 Member States who can vote, over 760 private sector members with no vote (equipment manufacturers, network, hardware and software developers, other SSOs,
Hold Annual conference (Face to face)	No Several consultation (but not decision making) meetings with constituents	Yes – About 2,000 People Attend and participate directly in standard setting	Yes- each year, over 100,000 technical professionals attend the more than 300 conferences sponsored or cosponsored by the IEEE	Yes, annual meeting of the committees- ATIS technical and standardization experts convene	Yes- working parties, study groups, regional meetings, and world meetings
Funding	FAF collects a tax from companies (as per SOX) based on their equity market capitalization (67% of budget) Sale of publications	Individuals and Organizations pay membership fee to Internet Society. Very low budget – most people involved are volunteers	Individuals pay $156 member fee and an additional $37 to participate in the standards association (IEEE-SA). corporations, SSOs,	Companies pay membership fee (from $1,000-$259,000 per year) based on sales, and a standard committee fee	Each country pays membership fee of 63,600 Swiss Francs per year

	(33% of budget)		trade associations, universities and Government agencies pay $ 1000 - $5,000 fee		
Standard Adoption Process					
Standards Initiated by	FAF and reviewed by FASAC (Advisory Council)	Grassroots members or Area Director (AD)	An IEEE-approved organization must sponsor a standard by filling out a PAR form (Project Authorization Request)	An issue Champion- an ATIS member or a forum or committee participant must fill out an issue identification form	Member states, and other duly authorized entities (national SSOs or individual companies)
Initial Screening	FASB staff summarize potential issues Directors and Board choose agenda	Review by AD who authorizes setting up a Bird of Feathers Group (BOF) Single AD has a lot of (localized) power at this stage	The New Standards Committee (NesCom) of the IEEE-SA Standards Board reviews the PAR and makes a recommendation to the Standards Board about whether to approve the PAR.	Standing committee of ATIS Board called Technology and Operations Council (TOPS) identifies issues and sets the agenda	The Director of TSB asks Member States to delegate authority to the competent study group
Ongoing Monitoring	FASB directors	Done by AD who selects a Chair and sets up a Working Group Charter (which is approved by IAB)	A "working group" of individuals affected by, or interested in, the standard is organized to develop the standard.	Done by Forums and Committees or they can delegate to subcommittees	Adopted by a study group in accordance with procedures established by WTSA
Working Groups	Full time FASB staff workers Resource group of external participants set up to provide advice	Create public mailing list – number and diversity of participants monitored by AD Agenda and minutes online	prepares a draft of the proposed standard	Post the issue's initial closure resolution on the ATIS Web Site and send to e-mail list Resource group of external participants (CIO Council) set up to	Review the text of the draft Recommendation Assess the summary statement in terms of its completeness and intention

	Agenda and minutes online	Create a document called Internet Draft (I-D)		provide advice	Debate to approve the Recommendations.
Quality Control Review	Done by external groups such as AcSEC, Auditing Standards Board of the AICPA, PCAOB, IASB, CFA Institute, FEI, and IMA. FASAC reviews the board's agenda	Done by Internet Engineering Steering Group (IESG) which consists of Area Directors – main focus to prevent overlap among standards. Like to defer to working groups on substance of standards	The draft standards, along with the balloting comments, are submitted to the IEEE-SA Standards Board Review Committee (RevCom). The RevCom reviews the proposed draft of the standard against the IEEE-SA Standards Board Bylaws and the stipulations set forth in the IEEE-SA Standards Board Operations Manual. The RevCom then makes a recommendation about whether to approve the submitted draft of the standard document.	If new and substantive information that directly impacts the resolution is brought to the attention of the Forum or Committee or the Forum or Committee determines that it is appropriate to hold the issue in the Initial Pending category in anticipation of the output of another industry group, regulatory body or similar organization, the issue may be automatically moved into the Initial Pending category	Done by directors of Telecommunication Standardization Bureau (TSB) TSB is in the team of study group management TSB organizes and coordinates the approval process of recommendations
Exposure Draft	Written exposure draft. Public given minimum of 30 days to respond.	Last Call issued by IESG with 4 weeks for outside input	Each member of the IEEE-SA Standards Board places a final vote on the submitted standard document. It takes a majority vote of the Standards Board to gain final approval of the standard.	An Issue is automatically placed into Final Closure provided: 21 calendar days have passed since the Issue's Initial Closure resolution and No new information surfaces	The text of the draft new or revised Recommendation must be available to TSB in a final edited form in at least one of the official and working languages.
Standard Adoption Threshold	Board of FASB Vote 50% +1 votes of FASB	No Voting Rough consensus as determined	75% of Votes Cast, and at least 75% of Working	First try for consensus (more than simple	70% of Votes cast (only government reps can

	Board members required to adopt a standard	by AD creates a "Proposed Standard" Subject to review by Internet Architecture Board (IAB)	group must vote Subject to review by IEEE Standards Association (IEEE-SA)	majority but not necessarily unanimous). Record minority views along with majority. Each company has one vote. Need 50% +1 Votes	vote – one vote per country) Review by The Telecommunication Standardization Bureau (TSB)
Can Issue More than One Standard for same Issue	No	Yes- though rare in practice	Yes	Yes	Yes
Can a company stack a std setting committee	No – Full time employees of FASB	No – monitored by AD	Yes – since individuals vote	No-Each company has only one vote	No- Each country has only one vote
Editor "Edits" Standard	Yes- the staff prepare a draft of a Final document for Board's consideration	Yes – Want to keep standards short and clear	IEEE Standards Style Manual sets "guidelines" for the clauses and format of the standards document	Yes- Forums and Committees work on the issues accepted.	Yes- Study groups are encouraged to establish an editing group in each study group to review the text for suitability in each of the official and working languages.
Standard Duration	Indefinite	Indefinite	5 years	Indefinite	Indefinite
Automatic Review of Standard Use	No – but revision triggered by Resource group members	No – Though revision can be triggered by Grassroots Members. After 6 months can also upgrade standard to "Draft Standard" if AD convinced 2 independent interoperable versions of the standard exist	Every 5 years Sponsor must re-affirm, revise or withdraw Standard. Revision goes through the same balloting process as adoption of a new standard	No- but revision triggered by internal communication in ATIS and external communication to organizations and liaisons established internally and externally	No- When a study group identifies the need for implementers to be made aware of defects in a Recommendation, it uses an implementers' guide to review standards.
Clarification of Standards	Done by Emerging Issues Task Force(EITF)	Can be done by changing status of standard	Ad-Hoc Sub-committee	Member of committee will respond in writing.	Done by the Director of TSB
Standards Competition	No – Want Uniformity	Done Ex-Post in the Market	Done Ex-Post in the Market, but also	Done Ex-Post in the Market	Done Ex-Post in the Market

			Sponsors some Ex-ante Olympic competition (experiment)	but also Sponsors some Ex-ante Olympic competition (experiment)	
Patents	N/A	Encourage Companies to disclose before standard adoption Set Patent royalty rate low or at zero	Encourage Companies to disclose before standard adoption Set Patent royalty rate low or at zero	Encourage Companies to disclose before standard adoption ANSI Patent Policy-American National Standards	Encourage Companies to disclose before standard adoption
Standards Output	1. Statement of Financial Accounting Standards (SFAS). 2. Concept Statements 3. Other implementation guidance	1. Best current Practice (BCP) 2. Standards – 3 stages (proposed, draft and Internet standard), 3. Non Standards (information, Experiential, Historical)	1. Mandatory requirement 2.Recommended Practice 3. Suggestion for working with technology	1 ATIS Standards 2. ATIS Implementable End-to-End Standard 3. Technical requirements specifications and reports. 4. Industry guidelines	1. Recommendations. 2. Handbooks 3. Regulations and Resolutions. 4.ITU operational bulletin 5. Focus Groups Technical Specifications (FGTS) 6. Bureaufax Table 7. Languages for Telecommunication Systems
Appeals process	No	Yes – Can appeal to IAB	Yes- The IEEE-SA Standards Board Chair shall appoint an appeals panel consisting of a chair and two other members	Yes- Formal or informal complaints. General Counsel can facilitate discussion or appoint appeal panel	Yes- Any request for reconsideration must be in writing to a study group or working party meeting.

FASB = Financial Accounting Standards Board (www.fasb.org)
IETF = Internet Engineering Task Force (www.ietf.org)
IEEE = Institute of Electrical and Electronics Engineers (www.ieee.org)
ATIS= Alliance for Telecommunications Industry Solution (www.atis.org)
ITU = International telecommunications union (www.itu.int/ITU-T/index.phtml)