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Anticipatory Reporting Standards

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SYNOPSIS: The Conceptual Framework offers an approach to understanding and managing reporting choices and their regulation. Qualitative characteristics of the underlying information, in terms of an unrelenting focus on relevance and reliability to the exclusion of particular interests or transaction motives, is a cornerstone of the Framework. We argue that the focus on qualitative characteristics precludes a focus on first-order economic fundamentals and, in the process, invites a static view of reporting standards, as opposed to one based on anticipation of their effect.

Keywords: conceptual framework; regulation.

INTRODUCTION

The Conceptual Framework (e.g., the FASB's Concepts series) envisions design, regulation, and intertemporal management of an entity's financial measurement system in terms of the qualitative characteristics of relevance and reliability, or relevance and faithful representation in the recent FASB/IASB preliminary view (FASB 2006). This approach of relying on qualitative characteristics has considerable pragmatic appeal and is the near universal organizing framework in our textbooks, not to mention its role at the FASB and IASB. Unfortunately, this pragmatic approach cannot well-reflect the underlying economics, and it also clouds the fact that Generally Accepted Accounting Principles (GAAP) is a regulated enterprise.

We argue GAAP is indeed a regulated enterprise, and that treating it as an economically regulated activity is illuminating and at odds with the Conceptual Framework. The centerpiece of this argument is (1) that accounting is a source of information, and not simply a measurement activity, (2) that GAAP governs the accounting information produced and disseminated by reporting entities, and (3) that anticipating the reporting entities' response to such reporting regulation is critical to designing efficient regulations. This essential anticipation is at odds with the Framework's neutrality theme,[1] but follows Watts' (2006)

[1] In its summary, Concept 2 states, ''Neutrality means that, in formulating or implementing standards, the primary concern should be the relevance and reliability of the information that results, not the effect that the new rule may have on a particular interest. A neutral choice between accounting alternatives is free from bias towards a predetermined result'' (FASB 1980).

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admonition that accounting regulators ''anticipate how managers and others will react to any standards or proposed reforms'' as well as Maines and Wahlen's (2006) observation that ''reliability impairments arise because preparers respond to incentives by interpreting or applying standards in a nonneutral fashion ... depend[ing] on the interaction between preparers' incentives and accounting standards.''

We develop our argument in the next section. Following that, we present a streamlined numerical example in which the basic tenets of our argument take shape in the form of explicit economic variables and factors, and the importance of anticipating the reporting entities' responses to reporting regulation is essential for identifying the efficient regulation. Our argument is further formalized in the Appendix, where we present a modest trading model in which the key steps in our argument are developed further, and on which the numerical illustration is based.

THE BASIC ECONOMIC ARGUMENT

Our argument proceeds in three steps. First, we claim accounting is a source of information, a claim that appears central to the Conceptual Framework itself. Indeed, the Framework is arguably viewed as a blueprint for regulating the supply of accounting-based information.[2]

Accepting this claim leads to the fact that, akin to labor, material and energy, information is a factor of production, useful in producing better decisions and improved control or governance (e.g., Christensen and Demski 2003; Hirshleifer and Riley 1979). But sorting this out, just as with other factors of production, rests on specification of the decision or control environment itself, including other sources of information. We term this specification of the setting the *finer details* of the setting.

Furthermore, most settings of concern to accounting involve a variety of actors and their activities, including competitors' possible use of the supplied information. The demand for accounting information is hardly characterized by unanimity among the various interested parties. The implication is clear: the best information source cannot be identified without identifying the finer details of the setting.[3] And treating accounting as a source of information leads us directly to a concern for the finer details of the setting.

The second step in our argument is that GAAP, as promulgated by regulatory authorities, amounts to regulation of an information source. The Conceptual Framework, however, substitutes *qualitative characteristics* of the financial statement information (i.e., the primary qualities of relevance and reliability) for specification of the *finer details* of the decision or control problem that the user of the financial statements is facing (Demski 1973,

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[2] Consider Concept 1, paragraph 6: ''Financial statements are a central feature of financial reporting. They are a principal means of communicating accounting information to those outside an enterprise'' (FASB 1978). Similarly, in the recent FASB/IASB preliminary view, paragraph IN2 (FASB 2006), we find an explicit acknowledgment that regulating the supply of information is the objective: ''The Boards have concluded that they need a framework to provide direction and structure to their work in developing requirements for financial reporting ... Standard setters cannot fulfill their missions without a sound and unified conceptual underpinning.''

[3] The single exception to this broad statement is a so-called Blackwell comparison where one information source is equivalent to another but with the addition of gratuitous noise, thus implying the less noisy source is preferred regardless of finer details. (See, e.g., Marschak and Miyasawa 1968; Christensen and Demski 2003.) And even here, we cannot accommodate strategic considerations.

Moreover, most information sources are noncomparable in the Blackwell sense. For example, aggressive versus conservative recognition of revenue are noncomparable in the Blackwell sense: the one reports sooner but with larger error while the other reports later but with less error. Which would you rather face? It depends on the finer details of the setting. (This particular timing issue is examined in Antle and Demski 1989 as well as, more abstractly, in Feltham 1972.) And absent noncomparability, we simply cannot rely on the easy way out of so-called qualitative characteristics. This is why we claim, in what follows, that reliance on qualitative characteristics cannot well-reflect the underlying economics.

1981; Christensen and Demski 2003). This substitution is likely to produce suboptimal and unintended results. By analogy, the demand for a particular protein source, such as beef, depends on tastes (broadly interpreted) and relative prices. We do not analyze the demand for beef by simply examining qualitative characteristics such as the beef's fat content and marbling.

Qualitative characteristics are designed to keep the finer details at bay, to gloss over them, so to speak, by inviting them into the analysis in reduced form. But this reduced form *cannot*, by design, carry all the essential economic details of the underlying resource allocation exercise. From an economic perspective, reliance on qualitative characteristics is, by its very nature, prone to error.

Accounting, then, is a source of information (the first step of our argument), and the Framework conceptualizes the accounting information source in terms of the relevance and reliability of its product, a conceptualization prone to error from an economic perspective (the second step of our argument). From this, the third step of our argument emerges. Efficient regulation must anticipate the reporting entity's response to the regulation.

This seems far from controversial. But the regulator's reliance on qualitative characteristics, instead of finer details, leads to a discernible pattern of misidentification. To be sure, a cost-benefit test is embedded in the Framework:

> Accounting information must attain some minimum level of relevance and also some minimum level of reliability if it is to be useful. Beyond those minimum levels, sometimes users may gain by sacrificing relevance for added reliability or by sacrificing reliability for added relevance; and some accounting policy changes will bring gains in both. Each user will uniquely perceive the relative value to be attached to each quality. Ultimately, a standard-setting body has to do its best to meet the needs of society as a whole when it promulgates a standard that sacrifices one of those qualities for the other; and it must also be aware constantly of the calculus of costs and benefits. (FASB 1985, ¶ 133)

But this leaves open the question of how the ''needs of society'' are to be perceived when the economic fundamentals, the finer details, are removed from the exercise. Put differently, the regulator's criterion becomes ill defined once we interject the qualitative characteristics simplification.

> The secondary qualitative characteristic of neutrality arises at this point. Neutrality in accounting has a greater significance for those who set accounting standards than for those who have to apply those standards in preparing financial reports, but the concept has substantially the same meaning for the two groups, and both will maintain neutrality in the same way. (FASB 1978, ¶ 98)[4]

> Neutrality does not mean without purpose, nor does it mean that accounting should be without influence on human behavior. Accounting information cannot avoid affecting behavior, nor should it ... To be neutral, accounting information must report economic activity as faithfully as possible, without coloring the image it communicates for the purpose of influencing behavior in some particular direction. (FASB 1978, ¶ 100)

In other words, the accounting should be done well and should reflect the best we can achieve in terms of a relevant and reliable reporting of transactions. It should not concern itself with particular interests; it should be neutral; it should not be influenced by any

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[4] Neutrality thus enters, almost as a compromise to accommodate the absence of finer details. We stress, however, that our primary concern is not the absence of finer details but the importance of anticipating the economy's response to a reporting regulation, and it is here, in the guise of neutrality, that the Framework is most striking in its rejection of such a view. The economic consequences are not adequately reflected in the Framework as pointed out by Zeff (1978). Indeed, Bratton (2007) argues that the FASB's explicit rejection of neutrality is a key to its success.

feedback effect.[5] In this manner we hopefully sidestep, to a degree, the unidentified finer details.

> Some reject the notion of accounting neutrality because they think it is impossible to attain because of the feedback effect. Information that reports on human activity itself influences that activity, so that an accountant is reporting not on some static phenomenon but on a dynamic situation that changes because of what is reported about it. But that is not an argument against neutrality in measurement. Many measurements relating to human beings—what they see when they step on a scale, what the speedometer registers when they drive a car, their performance in an athletic contest, or their academic performance, for example—have an impact on their behavior, for better or worse. No one argues that those measurements should be biased in order to influence behavior. Indeed, most people are repelled by the notion that some big brother, whether government or private, would tamper with scales or speedometers surreptitiously to induce people to lose weight or obey speed limits or would slant the scoring of athletic events or examinations to enhance or decrease someone's chances of winning or graduating. There is no more reason to abandon neutrality in accounting measurement. (FASB 1978, ¶ 102)

The effect, arguably, is to invite analysis of a reporting issue in a setting that is far removed from the finer details that gave rise to the reporting issue in the first place. To illustrate, in somewhat apocryphal terms, suppose a complex instrument with embedded ownership partitions and all sorts of contingencies arises. Here, the Framework invites two layers of substitution. First, the instrument is envisioned as arising in a setting where its economic fundamentals can be assessed, presumably some type of market setting where the instrument's fair value is discernible as opposed to the one in which it naturally arises. Second, concentrating on the thus identified fundamentals (viewed through the lens of qualitative characteristics), a measurement approach is identified, the measurement is then mandated for the instrument in its natural setting, and the matter is settled. In the process, the finer details have been skipped, including (1) the economic forces that gave rise to the instrument in the first place and (2) the likely response when these economic forces are confronted with the new regulation.

This substitution of a market setting amenable to the qualitative characteristics approach for the market setting that creates the reporting issue blinds the analysis to *anticipation* of how various parties will respond to the resolution of the particular reporting issue, the very key to rationalizing the regulation in the first place. Anticipating the regulation's effect is central to our analysis. Yet the Framework's reduced form treatment of the finer details invites a focus on measurement to the near exclusion of concerns for the effects of the mandated measurement.

This brings us full circle. The focus on qualitative characteristics clouds the vision, so to speak, of what consequences might be anticipated to flow from a particular regulation. And neutrality then surfaces to rationalize this clouded vision.

Substituting qualitative characteristics for the finer details is appealing, but this mindset ignores the possibility that transactions—not to mention trading arrangements—may well be designed in response to and even in anticipation of a particular reporting standard. What matters is how the resulting information will be used. For example, the issue is not bias in a speedometer, it is how the *information* provided by the (possibly biased) speedometer will be used. This is an inherently anticipatory issue, an issue that cannot be separated from the finer details. Stated differently, the underlying finer details matter, and the accounting standards affect the finer details.

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[5] Solomons (1991) made a similar point that accounting should attempt to seek neutrality despite the fact that it is impossible to achieve.

The concern, then, is the supply of transactions and anticipating how that supply changes in the face of a regulatory mandate. Neutrality, it seems, blinds us to the consequences of an endogenous supply of transactions, despite a long history of transaction design to, say, achieve pooling status, to achieve off balance sheet status, to achieve non-expense recognition, or to achieve delayed if not altogether avoided income statement display. That is to say that transactions are often designed to exploit if not avoid a regulatory dictate.

The Framework, with its use of qualitative characteristics, not only invites errors in regulatory analysis, but clouds the basic anticipatory nature of the regulator's task. A more ambitious Framework would emphasize the anticipatory nature of the regulator's task.

To be sure, this anticipatory perspective relies on identifying and understanding the finer details. This is no easy task, and surely clouded in its own set of errors. So a horse race emerges: Is the Framework's approach of sidestepping finer details more efficient than a more focused anticipatory approach, one complete with errors in its own right? Either approach invites error, but which offers the less noxious portfolio of errors? The answer is argumentative and illusive.[6] But the beginning point is understanding the incompatibility between focusing on qualitative characteristics versus focusing on finer details.

STYLIZED NUMERICAL EXAMPLE

Our argument takes on more depth when placed in a setting of explicitly specified finer details. For this reason, we work through a numerical illustration of a modest trading story, one where information matters, where regulation matters, and where anticipation of a regulation's effect matters. We begin with the finer details.

Finer Details

An individual owns a risky asset that must, for liquidity reasons, be sold to an investor or buyer. The sale takes place in a perfectly competitive market, so any gains to trade are captured by the seller. The eventual cash flow (perhaps in present value terms) that will accrue to the asset holder is some uncertain amount x that, for simplicity, is normally distributed with a mean of $E[x] = \mu = 1{,}000$ and a variance of $\sigma^2 = 100$.[7]

The market price for such an asset is assumed to reflect a discount for the asset's risk, and takes the following form:

[6] Anticipation, and thus explicit concern for finer details, is evident in other regulatory settings, such as the Federal Reserve (e.g., Tetlow and Ironside 2006; Sargent 2001). Similarly, a pattern of relying on qualitative characteristics does not preclude altogether an anticipatory perspective. Consider SFAS 150, ¶ 8: "The objective of this Statement is to require issuers to classify as liabilities ... three classes of freestanding financial instruments that embody obligations for the issuer. In applying this Statement, that objective shall not be circumvented by nonsubstantive or minimal features included in instruments." Similarly, in discussing neutrality, Schipper (2002) states, "it would be helpful to standard setters to know the neutrality (or lack of neutrality) characteristics of a given proposal ... [but] I believe that claims about the neutral or nonneutral effects of a given proposed standard are very difficult or impossible to investigate before the fact." Yet, we continue to witness transaction redesigns in the face of regulatory mandates, as in the emerging interest in newly designed financial instruments that will, presumably, alter the impact of stock option expensing.

[7] As will become clear, the centerpiece of our streamlined story is the error in an unbiased estimator of an underlying asset. This error, which is described by a normal distribution, suggests the variance of the error as a measure of the estimator's reliability. This follows a long line of modeling work, including Ijiri and Jaedicke (1966), Kirschenheiter (1997), Verrecchia (1990), and a host of empirical studies aimed at documenting various facets and effects of information quality, including those aimed at reliability *per se* (and reviewed by Maines and Wahlen 2006), as well as studies such as Francis et al. (2005), that are concerned with the pricing of information quality.

$$P = \mu - k\sigma^2 = 1{,}000 - 7(100) = 300$$

where we assume the risk discount is $k = 7$ dollars per unit of variance. Thus, one option open to the present owner is simply to sell his asset for 300.

A second option is for the present owner to produce and disclose some value relevant information about his asset's value. Let q denote the quality of this information and y denote the signal that is produced. Though we will eventually specify this information quality, q, as one over the variance of the noise in the information variable, for the moment it is sufficient and convenient to treat it simply as a measure of the information's quality.

We assume this information leads to a revised estimate of the mean of cash flow x according to

$$E[x|y] = \mu + \frac{\sigma^2}{\sigma^2 + 1/q}(y - \mu) = 1{,}000 + \frac{100}{100 + 1/q}(y - 1{,}000)$$

and a revised variance of cash flow of

$$\frac{\sigma^2}{1 + q\sigma^2} = \frac{100}{1 + 100q}.$$

So, absent any information, cash flow is normally distributed with a mean of $E[x] = \mu = 1{,}000$ and a variance of $\sigma^2 = 100$. But with information of quality q producing signal y, cash flow is normally distributed with a mean of

$$1{,}000 + \frac{100}{100 + 1/q}(y - 1{,}000)$$

and a variance of

$$\frac{100}{1 + 100q}.$$

Moreover, the information is unbiased in that the expected value of the signal is the mean of the underlying cash flow: $E[y] = E[x] = \mu = 1{,}000$.

Intuitively, now, if the information quality is very, very high, q is a large number, the revised mean is y itself and the variance of the revised estimate is essentially 0. This is perfect information; it tells us exactly what the cash flow will be, and thus no risk remains. At the other extreme is the case of zero quality, so $q = 0$; here the revised mean is the original mean of 1,000 and the variance of the revised estimate is unchanged (and thus remains at 100).

Once information of quality q is produced and released, the asset's market price adjusts to reflect what is learned about the mean of the future cash flow as well as for the reduction in the perceived riskiness of that cash flow:

$$
\begin{aligned}
P &= \mu + \frac{\sigma^2}{\sigma^2 + 1/q}(y - \mu) - k\frac{\sigma^2}{1 + q\sigma^2} \\
&= 1{,}000 + \frac{100}{100 + 1/q}(y - 1{,}000) - \frac{7(100)}{1 + 100q}
\end{aligned}
$$

For example, if perfect information is provided (q is very large), the risk disappears altogether and the price becomes $P = y$.

Continuing, since the information is unbiased, the expected price, expected before information of quality q is provided, is

$$
\begin{aligned}
E[P] &= E\left[\mu + \frac{\sigma^2}{\sigma^2 + 1/q}(y - \mu) - k\frac{\sigma^2}{1 + q\sigma^2}\right] = \mu - k\frac{\sigma^2}{1 + q\sigma^2} \\
&= 1{,}000 - \frac{7(100)}{1 + 100q}.
\end{aligned}
$$

The seller is the only source of information. Why does he care about providing information for the buyer, and what quality should he provide? We assume he is risk neutral and thus cares only about the expected value of the price he receives, less any information cost. If he supplies no information, we know he will net 300; but if he supplies perfect information, he will net an expected price of $E[P] = E[y] = 1{,}000$ *less* the cost of the information.

The information's cost, in turn, depends on its quality. We assume it is given by

$$
c(q) = .02(150 - 1/q)^2
$$

if $q > 1/150$ and 0 otherwise. So seriously poor quality information ($q \leq 1/150$) is costless, and above this minimum, the cost is increasing in quality.

Public Choice of Information Quality

This provides a perfect market setting, one where information is potentially costly, where its quality is chosen by the seller, and where that choice is publicly observed. If reasonably high quality information is produced, the selling price will adjust to reflect lower risk to the buyer as well as the revised estimate of the underlying cash flows. Emphatically, the price will vary with signal y.

Because he is risk neutral, however, the seller cares only about expected price, net of his information cost. So he solves the following to select the information quality that will maximize his expected net gain:

$$
\max_q E[P] - c(q) = 1{,}000 - \frac{7(100)}{1 + 100q} - c(q).
$$

The optimal information quality is $q^* = 1/110.509$, which implies an expected price of $E[P] = 632.53$, an information cost of 31.19, and a net expected amount to the seller of $E[P] - c(q^*) = 601.34$.

To this point, no reason exists for a regulator to intervene in the trading arrangement. The seller fully internalizes the effect of his information production because the buyer is able to verify the information quality, and the efficient amount of information is, therefore, produced. We call the resulting quality choice of $q^* = 1/110.509$ the *perfect market* choice, to distinguish it from what follows.

Private Choice of Information Quality

Now assume that the buyer cannot verify the seller's choice of information quality. The market is not naïve and realizes the seller is offering information of unverified quality. It will anticipate or conjecture that the seller will supply some specific quality level, which we denote $\bar{q}$. The price, in turn, will reflect the eventual signal and this conjectured quality, or

$$\begin{aligned} P &= \mu + \frac{\sigma^2}{\sigma^2 + 1/\bar{q}}(y - \mu) - k\frac{\sigma^2}{1 + \bar{q}\sigma^2} \\ &= 1{,}000 + \frac{100}{100 + 1/\bar{q}}(y - 1{,}000) - \frac{7(100)}{1 + 100\bar{q}} \end{aligned}$$

and this implies an expected price of

$$\begin{aligned} E[P] &= E\left[\mu + \frac{\sigma^2}{\sigma^2 + 1/\bar{q}}(y - \mu) - k\frac{\sigma^2}{1 + \bar{q}\sigma^2}\right] = \mu - k\frac{\sigma^2}{1 + \bar{q}\sigma^2} \\ &= 1{,}000 - \frac{7(100)}{1 + 100\bar{q}}. \end{aligned}$$

Importantly, the expected price depends on the conjectured but not the actual quality. This means the seller's choice of quality does not affect the market's risk perception. He is not to be trusted to provide personally costly information when the quality of that information cannot be ascertained. So, in equilibrium, the market anticipates, or conjectures, that the seller will supply minimal cost information quality, here $\bar{q} = q^{**} = 1/150$. And that is exactly what the seller will provide. We thus wind up with an under-supply of information quality, an expected price of $E[P] = 580$, an information cost of 0, and a net to the seller of $E[P] - c(q^{**}) = 580 < 601.34$.

In this market, private selection of information quality by the seller does not support the perfect market solution, because the seller cannot be trusted to supply the proper (personally costly) information quality. One avenue open at this point is regulatory intervention, presuming any such regulation can be readily enforced.

Assuming so, what should the regulator do at this point? This answer is simple: decree a reporting standard, denoted q^R, that information quality in this setting cannot fall below; and set the standard at the corresponding perfect market solution, or $q^R = q^* = 1/110.509$. In this case, the seller's compliance with the regulation will result in the perfect market solution. The market, in turn, will anticipate compliance and price the asset accordingly. In turn, the seller will comply by setting $q = q^R$, as the solution to

$$\max_{q \geq q^R = q^*} E[P] - c(q) = 1{,}000 - \frac{7(100)}{1 + 100\bar{q}} - c(q)$$

is $q = q^* = \bar{q}$, as conjectured.

Notice, in particular, that we analyzed what quality would arise in a perfect market solution, and then imposed this as a regulation in the imperfect market case. The analogy to fair value-based regulation is striking. But is this always a useful approach?

Multiple Compliance Options

The answer is negative if the seller has the option of redesigning the underlying transaction so it has the appearance (or the reality) of compliance with the regulation. Suppose an alternative scenario exists where, after the regulator announces a minimal information quality of q^R, the seller is able, at a cost, to restructure the underlying transactions so they have the appearance of satisfying the regulatory constraint. In particular, suppose the seller can create the appearance of compliance, but actually set $q < q^R$ by incurring cost

$$d(q) = .02(1/q - 1/q^R)^2$$

if $q < q^R$ and zero otherwise.

Buyers, of course, anticipate or conjecture the actual information quality choice as before. The difference is the seller will now balance the direct, $c(q)$, and indirect, $d(q)$, costs of information quality as he has to maintain the appearance of complying with the regulation. The market price will be set in full anticipation of this balancing activity. With the market anticipating actual information quality of $\bar{q}$, the seller's balancing is described by

$$\max_q E[P] - c(q) - d(q) = 1{,}000 - \frac{7(100)}{1 + 100\bar{q}} - c(q) - d(q).$$

For example, suppose the regulation is set at $q^R = 1/100$. Here the market will conjecture a lower quality, of $q = 1/125$ and facing this conjecture, the seller will indeed set $q = 1/125$, incur information cost of $c(q) = 12.5$ and redesign cost of $d(q) = 12.5$. The expected price is 611.11, and so the seller has an expected net gain of 586.11.

Additional possibilities are reported in the following table. Importantly, for any regulation tighter than the gratuitous level of $q^R = 1/150$, the seller will always use a combination of the compliance and restructuring approaches at his disposal and will, in equilibrium, supply lower quality information than is required by the regulation. Anticipation is essential in analyzing the proposed regulation.[8]

More broadly, we have Figure 1, where we plot the seller's net gain (which is an appropriate welfare measure here because the buyers know, in equilibrium, precisely what they are buying) versus the regulator's mandate. The important point is the information quality that is the efficient solution when redesign is an option (scaled $q^R = 84.71$) is *lower* than its counterpart when redesign is not an option (scaled $q^R = 90.49$). It is inefficient to envision the transaction as taking place in a perfect market setting and then use that resolution to set the reporting standard for the environment in which the transaction actually

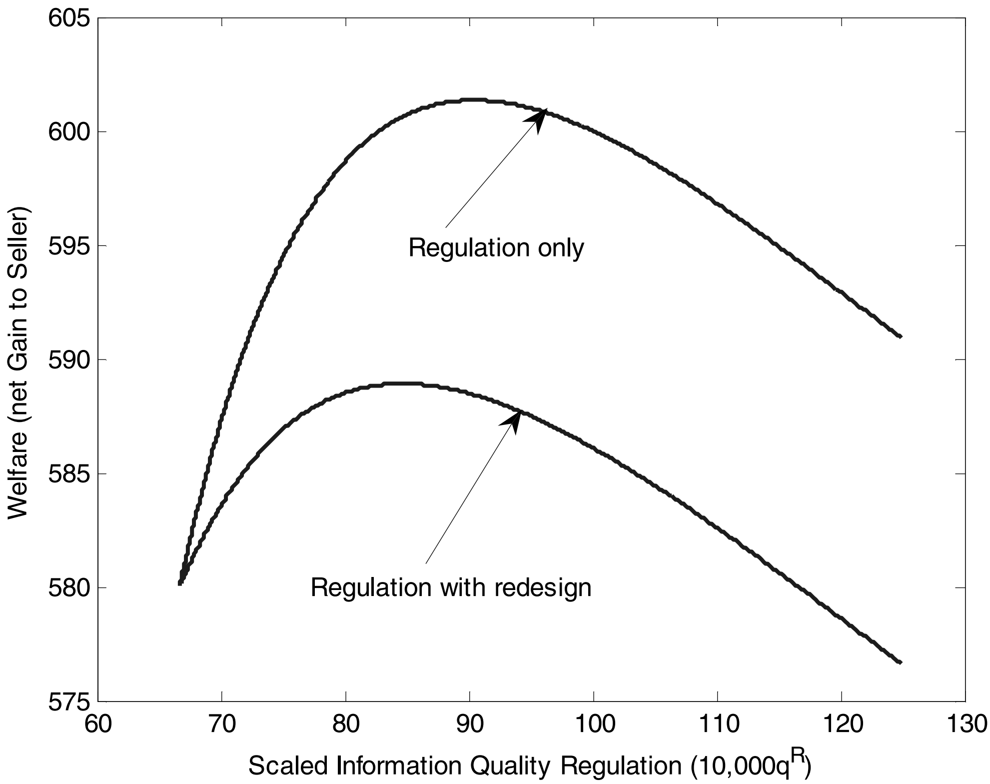
[8] The example should be interpreted as a scaled illustration, as no attempt has been made to calibrate to some economy-wide phenomenon. Thus, the direction but not the magnitude of improvement is what matters. Also notice in, say, the no-redesign case that the seller but not the buyer would be motivated to lobby for regulation.

TABLE 1
Selected Results for Numerical Illustration

Information Quality Regulation (q^R)	Scaled[a] Information Quality Regulation ($10{,}000q^R$)	No Redesign Option; Seller Must Comply with Regulation: Equilibrium Information Quality (q)	No Redesign Option; Seller Must Comply with Regulation: Net Gain to Seller	Redesign Option; Seller Balances Compliance and Redesign Costs: Equilibrium Information Quality (q)	Redesign Option; Seller Balances Compliance and Redesign Costs: Net Gain to Seller
0	0	1/150.00	580.00	1/150.00	580.00
1/118.05	85	1/118.05	600.61	1/134.04	588.91
1/110.51	90	1/110.51	601.34	1/130.26	588.42
1/100.00	100	1/100.00	600.00	1/125.00	586.11

[a] The information quality is scaled by multiplying by the constant 10,000; so a regulation of $q^R = 1/118.05$ is scaled as 10,000/118.05, or, rounding, simply 85. The scaling is useful in graphing the relation between regulation and welfare in Figure 1.

FIGURE 1
Information Quality Regulation versus Welfare



does arise. Ignoring the finer details here, and in the process failing to anticipate how the actors will behave, leads to an inefficient information quality regulation.[9]

Back to Qualitative Characteristics

The example, then, provides an exercise in which information quality is well defined, in which the quality of the information matters, and in which regulation of that quality is sensible when the information provider, the seller here, cannot be trusted to actually supply the claimed information quality. In turn, the regulator should mandate the perfect market solution *if* the seller has no option but to comply with the regulation.[10] But the regulator should mandate a more lenient regulation if the seller has redesign options as well.

This follows from the fact that, when the seller has redesign options, he will respond to the regulation with a combination of information quality and redesign activities.[11] The latter, however, are otherwise unproductive; they consume resources and create no social benefit; they create a deadweight loss but are inevitable. Dealing with the inevitable deadweight loss is part of the social welfare maximizing calculus, one of the consequences that follow from the regulatory mandate. Put differently, the regulator's solution depends critically on anticipation of how those affected will respond to the regulation.

Here, the redesign option is used in conjunction with the compliance option, and this has the effect of raising the social cost of compliance. So the optimal regulation induces less quality than in the perfect market solution and does so by decreeing a quality standard that is itself less than the perfect market solution.

The example is designed so that information quality is well defined (a point we develop in the Appendix) and can be thought of in terms of relevance or reliability. So focusing on a qualitative characteristic does not, in itself, lead to error in this case. Rather, error enters when we slight the finer details and ask ourselves what information quality would be provided under perfect market or arms-length transactions and then impose this solution in the environment in which the transaction is actually taking place. Analyzing the regulatory issue in this manner, by moving the transaction to a comfortable, exogenous setting, removes the anticipation calculus from the scene. It is, so to speak, neutral in appearance, but hardly efficient in fact. Indeed, the difference between the comfortable and anticipatory approaches widens when we introduce heterogeneous firms facing a common reporting standard.[12]

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[9] This hints at how we solve for equilibrium behavior when redesign is an option. The seller maximizes his net gain, given the market's conjecture of what he will do; and, simultaneously, what the market conjectures is the answer to his maximization. This is developed in the Appendix. Also, notice the seller with the redesign option does not fare as well here because the market (correctly) does not trust him to abstain from redesign, and correctly conjectures the noted information quality.

[10] Even this straightforward approach is questionable when we have multiple regulations. This raises the scepter of the classic theory of the second best in which setting one dimension to the perfect market solution does not guarantee improvement unless all instruments are so set. See Christensen and Demski (2003).

[11] The seller will always appear to comply with the regulation.

[12] To extend the illustration, suppose we add a second firm to the story, identical in all respects except its transaction redesign cost is one fourth of that of the original firm. (Their respective random shocks are assumed independent.) If they are independently regulated, the respective quality regulations are *1/118.05* and *1/120.64*. Responding to the lower redesign cost for the second firm, the regulator imposes a more lenient regulation for that firm. Conversely, suppose a single, economy-wide standard is imposed, or at least one that applies equally to roughly comparable firms. We find, attaching equal welfare weight to each of the two firms, that the welfare maximizing common regulation is $q^R = 1/118.84$. This regulation does not equally impact the two firms, even though they are treated as co-equals for welfare purposes. The reason is they differ in their respective marginal costs of transaction redesign, and anticipatory regulation takes this into account. In the larger picture, however, this reinforces the point that the finer details are important in identifying the optimal regulation. The result is in no way neutral or optimal to one particular firm; it depends on all the details.

CONCLUSION

The Conceptual Framework is not inherently anticipatory; it invites an arguably neutral approach of focusing on how transactions are best reported, independent of the motives behind or supply of those transactions. In so doing, it treats accounting issues as a first-order concern, but relegates the supply of transactions to second-order concern. As a result, the essential role of anticipating the reaction to a reporting standard is shorted in the regulatory calculus.

Reporting details are potentially driven by the reporting standard in conjunction with the particular interests of the reporting organization. The reporting organization is likely to be better informed than the rest of the players, and also to have private reporting incentives. This opens a feedback loop which is not easy to control by means of good intentions. The Framework mutes if not blinds the analysis to these reactive effects, and, as a consequence, fosters potentially serious error when used as a platform for instruction or regulation.

To be sure, admitting to reactive effects is easier than effectively dealing with them. We do not expect our regulators to be prescient, and this raises the question of whether a regulatory approach that devotes serious effort to dealing with finer details and estimating reactive effects, though with inevitable error, would perform more or less effectively than the *status quo*. Stated differently, is the portfolio of regulatory missteps likely to be more or less troubling if (1) the qualitative characteristics approach, with its lack of emphasis on finer details and reactive effects, were followed or (2) a more consequential approach, based on finer details and errors in their assessment, were followed?[13]

This is a debate we are yet to engage. But it is also a debate the Conceptual Framework, in its present form, does not encourage. To be effective, the Framework must, in our view, adopt an equilibrium perspective, one based on anticipation of the effect of the promulgated standards or regulations. The finer details of the reporting problem are important, including the equilibrium supply of transactions.[14]

Once this equilibrium perspective is part of our cognitive fabric, we will be in a position to engage such a debate.

APPENDIX
THE UNDERLYING MODEL

The purpose of this Appendix is to lay out and analyze the model on which the numerical example is based. In the process, we offer a closed-form theoretical critique of the Framework.

Recall that an individual owns an asset with uncertain future cash flow prospects. We model its (gross) value V as:

$$V = \mu + \varepsilon_1 \qquad \text{(A1)}$$

where μ is the mean and ε_1 is a zero mean normal random variable with variance denoted σ_1^2. Prior to selling, the seller produces a publicly observed signal y, an estimate of the asset's value, given by:

[13] In laying out our argument, we have focused on a single reporting entity. The prior note, where we extend the regulator's sphere to two firms, gives a hint of the error potential in estimating reactive effects across a number of firms.

[14] We have a long tradition in accounting of viewing proper accounting in classical terms, by treating the transaction as exogenous and applying a classical measurement perspective to that transaction. This is precisely what we want to do here, provided transactions are exogenous. But if they can be redesigned, the welfare maximizing perspective is to treat the transaction redesign as a first-order effect and adopt an equilibrium perspective.

$$y = V + \varepsilon_2 \tag{A2}$$

where ε_2 is a zero mean normal random variable, with variance denoted σ_2^2. The two shock terms, ε_1 and ε_2, are independent. Any would-be buyer lacks access to any other information source and thus, relies exclusively on the seller's estimate of value.[15]

Moreover, the seller is unable to opportunistically manipulate the resulting estimate. In this way, we avoid issues of earnings management, window dressing, or strategic injection of bias. This is done not to sidestep important issues, but to keep the focus on the anticipatory theme with minimal baggage. The sole reporting issue is the noise in the value estimate in A2. This noise is measured by the variance of the noise term, σ_2^2, and using the language of the Conceptual Framework, it is interpreted as the reliability of the estimate. (Lower variance means higher reliability.)

Public Reliability Choice

For the moment, assume all of this structure is common knowledge, including both variances. Once signal y is observed, Bayesian revision implies that the seller and potential buyers view the asset's gross value as a normal random variable with mean $E[V|y] = \mu + \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}(y - \mu)$ and variance $\sigma^2 = \frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2}$. At this point, the asset is sold in a perfectly competitive market where price is given by the mean less a discount of $k > 0$ per unit of variance:[16]

$$P(y) = E[V|y] - k\sigma^2 = \mu + \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}(y - \mu) - k\frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2}. \tag{A3}$$

The *a priori* variance or uncertainty about asset value, σ_1^2, is due to unanticipated economic shocks that cannot be influenced by either the seller or the accounting regulator. However, our model allows the seller and the accounting regulator to influence the signal variance or reliability, σ_2^2. In other words, σ_1^2 is exogenous, but σ_2^2 is endogenous.

Prior to observation of signal y, the seller chooses σ_2^2 in anticipation of its effect on the selling price, net of his personal cost. The seller's choice of σ_2^2 is publicly observed. This implies that, prior to observation of y, the eventual selling price, $P(y)$, is a normal random variable with a mean of $E[P] = \mu - k\frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2}$ and a variance of $\frac{\sigma_1^4}{\sigma_1^2 + \sigma_2^2}$, both of which depend on the choice of σ_2^2.

The seller is risk neutral.[17] Let $c(\sigma_2^2)$ denote his personal cost of supplying reliability of σ_2^2, where σ_2^2 is constrained to be within a feasibility region of $\sigma_2^2 \in [a,b]$. So, for example, the maximum variance or minimum reliability is $\sigma_2^2 = b$. Moreover, as lowering the variance is costly, $c(\sigma_2^2)$ is a decreasing function of σ_2^2, or $c'(\sigma_2^2) < 0$.

Importantly, the mean and the variance of the forthcoming selling price depend on the seller's choice of σ_2^2. Coupled with risk neutrality, this implies the seller selects σ_2^2 to maximize the expected value of the selling price, $E[P|\sigma_2^2]$, less the information cost:

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[15] The Google IPO was allegedly hampered by a lack of information provided by the firm and an inability of potential buyers to gather information on their own (e.g., *Wall Street Journal* 2004).

[16] This discount for risk can be interpreted as risk aversion *per se* or as a value in use that is sensitive to the amount of uncertainty.

[17] A risk-neutral seller is not essential in what follows, but dramatically reduces the complexity. We are indebted to Anil Arya for this observation.

$$E[P|\sigma_2^2] - c(\sigma_2^2) = \mu - k\,\frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2} - c(\sigma_2^2) \qquad \text{(A4)}$$

subject, of course, to the feasibility region of $\sigma_2^2 \in [a,b]$. Let σ_2^{2*} denote the seller's maximizing choice.[18]

Notice the seller's trade-off. Having high reliability (low σ_2^2) is costly, but lowers the anticipated discount (of $k\,\frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2}$) in the forthcoming sale. This is the essential trade-off in what follows.[19] We emphasize the simplicity of the setting.[20]

With suitable regularity, and presuming an interior solution, the seller's reliability choice is given by the following first-order condition for maximizing the seller's expected gain in A4:

$$(-k)\,\frac{\sigma_1^4}{(\sigma_1^2 + \sigma_2^2)^2} - c'(\sigma_2^2) = 0.$$

To put slightly more structure on the setting, we make two additional assumptions. First, the information cost is given by:

$$c(\sigma_2^2) = \frac{\omega}{2}\,(b - \sigma_2^2)^2$$

where, again, $\sigma_2^2 \in [a,b]$, and $\omega > 0$ is a parameter that specifies the rate at which the seller's personal cost increases with information quality. (Notice that the maximal variance of $\sigma_2^2 = b$, the minimal reliability choice, incurs zero cost.) Second, to ensure concavity, so the seller's choice problem in A4 is well defined, we also assume:

$$\omega > 2k\sigma_1^4/(\sigma_1^2 + a)^3.$$

These assumptions are maintained throughout. Also, assuming $k > 0$ and $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$ ensures the seller's choice problem is well behaved, i.e., $a < \sigma_2^{2*} < b$.

Finally, to translate this rendering to the example, simply define information quality q by $q = 1/\sigma_2^2$. Everything in the example follows from this substitution.[21]

Qualitative Characteristics

Stepping back, the model is designed so the public information in A2 can be interpreted as an accounting measure or estimate of value. In this fashion, the public observable,

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[18] A4 will turn out to be the relevant welfare measure, as all gains to trade accrue to the seller. In this way, redistributive effects (e.g., Hirshleifer 1971; Beardsley and O'Brien 2004) or market failure in the extreme are not present, by design.

[19] Subsequently, when the seller's costly reliability choice is not observable, we create a market friction that opens the door for regulation.

[20] Treating the seller as risk averse sets up an additional tension because the selling price to which he is exposed is risky and not insurable. We might also, as in, say, Woodlock and Young (2001), Stocken and Verrecchia (2004) or Ewert and Wagenhofer (2005), introduce an explicit stewardship issue. But to stay as close as possible to the Conceptual Framework, we use a streamlined setting in which the trade friction concerns the value of an entity.

[21] Also notice that pricing the risk discount in the assumed pricing is important here. Setting $k = 0$ would remove any interest in producing information of nontrivial quality.

variable y, is simultaneously a source of information and an accounting measure. In addition, the model is designed so that reliance on qualitative characteristics of relevance and reliability is not a source of error *per se*. This allows us to link our analysis with the qualitative characteristics theme and concentrate on the anticipation theme.

Returning to the Conceptual Framework, this public information is relevant if it has the "capacity ... to make a difference in a decision" (FASB 1980, Glossary of Terms) and it is reliable to the extent it is "reasonably free from error and bias and faithfully represents what it purports to represent" (FASB 1980, Glossary of Terms). Glancing back at the pricing equation in A3, we see that the market price for the asset varies with y as follows:

$$\partial P(y)/\partial y = \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}.$$

Under our assumption that the variance term, σ_2^2, is bounded, the information is relevant to the pricing exercise. Indeed, relevance is a nominal concept here, it is present or absent (and present by construction).

On the other hand, measure y's reliability, the σ_2^2 variance, is central to the analysis. It is chosen by the seller, and the finer details of this choice reflect the tension between imposing cost on the seller as opposed to imposing risk on the buyer. Reliability affects the weight assigned to measure y in the pricing equation (the signal response coefficient of $\frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}$), the buyer's residual uncertainty discount in the pricing equation (the $k \frac{\sigma_1^2\sigma_2^2}{\sigma_1^2 + \sigma_2^2}$ term), and the seller's cost of producing the information. We do not, however, face a reliability versus relevance trade-off, simply by design.

Given the presumed competitive pricing, the buyer is price protected and all the gains to trade are realized by the seller. Because of this, the seller's reliability choice maximizes not only his welfare but also society's welfare. Moreover, regulation of that choice is a moot issue, because (in the tradition of Coase 1960) the choice is observable and made by the one who captures all the gains to trade.

Private Reliability Choice

We next turn to the setting where the seller's reliability choice is not publicly observed. We proceed with a rational expectations equilibrium, wherein, the market anticipates a reliability choice denoted $\bar{\sigma}_2^2$. This implies a pricing function of:

$$P(y|\bar{\sigma}_2^2) = \mu + \frac{\sigma_1^2}{\sigma_1^2 + \bar{\sigma}_2^2}(y - \mu) - k\frac{\sigma_1^2\bar{\sigma}_2^2}{\sigma_1^2 + \bar{\sigma}_2^2} \quad \text{(A5)}$$

where the buyer's mean and variance conjectures reflect the anticipated reliability choice of $\bar{\sigma}_2^2$. The risk that is priced is the conjectured risk, and the signal response coefficient, $\frac{\sigma_1^2}{\sigma_1^2 + \bar{\sigma}_2^2}$, reflects the conjectured as opposed to the actual reliability choice.

Turning to the seller's reliability choice, prior to observation of signal y, $P(y|\bar{\sigma}_2^2)$ is again a normal random variable, but with a mean of $E[P|\bar{\sigma}_2^2] = \mu - k\frac{\sigma_1^2\bar{\sigma}_2^2}{\sigma_1^2 + \bar{\sigma}_2^2}$ and a variance of $\frac{\sigma_1^4(\sigma_1^2 + \sigma_2^2)}{(\sigma_1^2 + \bar{\sigma}_2^2)^2}$. Parallel to A4, the seller selects his reliability to maximize:

$$E[P|\bar{\sigma}_2^2] = \mu - k\,\frac{\sigma_1^2\bar{\sigma}_2^2}{\sigma_1^2 + \bar{\sigma}_2^2} - c(\sigma_2^2), \tag{A6}$$

again subject to $\sigma_2^2 \in [a,b]$.

Notice, however, that information quality higher than the minimum, $\sigma_2^2 < b$, increases the seller's information cost with no effect on the expected price. In equilibrium, then, the market will anticipate the minimum information quality, $\bar{\sigma}_2^2 = b$, and the seller will confirm this conjecture by setting $\sigma_2^2 = \bar{\sigma}_2^{2*} = b$.

Intuitively, in the public setting, the seller's choice of σ_2^2 affects the equilibrium pricing function, and he captures any expected price increase associated with higher quality. But when the market cannot verify the seller's reliability choice, the pricing function reflects the market's conjecture about his choice. In equilibrium, the market conjectures minimum reliability and the seller can do no better under the circumstances than provide minimal reliability. This market failure opens the door for regulation.

Regulated Reliability Choice

Gains to trade are present in this setting. Competition, however, ensures the buyer is price protected and that all the gains to trade accrue to the seller. Socially, then, we focus on the seller's welfare as the relevant welfare measure.

Clearly, the welfare measure is higher when the seller's reliability choice is public. This leads to the question of whether regulatory intervention in the private case might be desirable. Suppose, then, that a regulator or standard setter enters the picture and mandates a reliability requirement or standard of $\sigma_2^2 \in [a,b^R]$, where $a < b^R < b$. Presuming costless and error free enforcement, this implies an equilibrium variance upper bounded by $b^R < b$.

If the regulator is adroit and unconstrained, he can set $b^R = \sigma_2^{2*}$, the optimal choice in the public setting. This, of course, is welfare maximizing in this particular setting. Furthermore, this is, by analogy, the very essence of the Conceptual Framework's approach. We divine the perfect market solution, as in a fair value argument (where we decree measurement based on classically specified arms-length trade) and impose that solution, so to speak. And this is precisely what we want the regulator to do in this setting. Setting a standard equal to the competitive market's reliability produces, in this case, the amount of reliability that maximizes social welfare. Moreover, even if the regulator errs in identifying the classical market solution, merely moving the reporting in that direction is socially desirable.

Proposition 1: Assume $k > 0$ and $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$. Then there exists $\underline{b} < \bar{\sigma}_2^{2*}$, such that any regulatory standard $b^R \in (\underline{b},b)$ is welfare improving relative to the private choice equilibrium.

Proof: Our previous analysis implies $a < \sigma_2^{2*} < b$ and $\bar{\sigma}_2^{2*} = b$. Continuity ensures we can find an interval such that any $b^R \in (\underline{b},b)$ is welfare improving.

Unfortunately, this conclusion rests on the reporting firm, the seller, having no additional options or techniques with which to confront the regulator's dictate.

Regulated Choice under Designer Transactions

From here, we place a second option or technique in the seller's hands by assuming the regulator announces a regulatory constraint of $\sigma_2^2 \in [a,b^R]$, but the seller is able, at a cost, to restructure the underlying transactions so they have the appearance of satisfying the regulatory constraint.[22] In particular, suppose the seller can create the appearance of compliance, but actually set $\sigma_2^2 > b^R$ by incurring cost $d(\sigma_2^2, b^R)$ where:

$$d(\sigma_2^2, b^R) = \frac{\upsilon}{2}(\sigma_2^2 - b^R)^2$$

if $\sigma_2^2 > b^R$ and 0 otherwise; and υ is a parameter that specifies the rate at which the seller's restructuring cost increases with "distance" from the regulation. The buyer, of course, anticipates such behavior and conjectures a reliability choice of $\overline{\sigma}_2^2$. We are back to the pricing expression in A5, and the seller thus selects his reliability to maximize:

$$\mu - k\frac{\sigma_1^2\overline{\sigma}_2^2}{\sigma_1^2 + \overline{\sigma}_2^2} - c(\sigma_2^2) - d(\sigma_2^2, b^R). \tag{A7}$$

Presuming an interior solution, in equilibrium, the seller uses a mixture of reliability investment and costly transaction restructuring to satisfy the regulator's promulgation.

Anticipatory, Equilibrium Perspective

When transaction restructuring is available, the regulation should not be set as though the perfect market setting were present, i.e., set $b^R = \sigma_2^{2*}$, nor should it be set so that the resulting equilibrium reliability mirrors that of the perfect market setting, i.e., set the regulation such that a reliability choice of σ_2^{2*} obtains. This follows from the seller having an additional option for dealing with the regulation. To maximize social welfare, the regulator must anticipate how that option will be used. The optimal regulation calls for an equilibrium perspective, anticipating reactions to the standard and balancing the particular interests of the market participants.[23]

We summarize as follows, where σ_2^{R2} denotes the equilibrium supply of reliability under regulation b^R and, recall, σ_2^{2*} denotes the perfect market reliability choice:

Proposition 2: Assume $k > 0$, $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$, and $\upsilon > 0$. Then (1) the optimal regulation exhibits $b^R > \sigma_2^{2*}$; (2) $\sigma_2^{R2} > b^R$ if $b^R < b$; and (3) the optimal regulation induces $\sigma_2^{R2} > \sigma_2^{2*}$.

Proof: We know σ_2^{2*} is strictly interior. From here, the proof follows by maximizing welfare, as implied by A7,

$$W(b^R) = \mu - k\frac{\sigma_1^2\overline{\sigma}_2^2}{\sigma_1^2 + \overline{\sigma}_2^2} - c(\sigma_2^{R2}) - d(\sigma_2^{R2}, b^R)$$

22 Dye (2002) emphasizes the importance of shadow standards by endowing the seller with the ability to restructure transactions so as to be in compliance with a reporting standard. Parallel stylizations are used in, say, Fischer and Stocken (2004) and Stocken and Verrecchia (2004). Also, Jorgensen and Kirschenheiter (2003) model equilibrium pricing when the firm's cash flows are affected by a market-wide factor and an idiosyncratic factor. The latter's variance is privately learned and can be disclosed, at a cost. Partial disclosure results, absent regulation, and regulation is far from benign.

23 The secondary characteristic of representational faithfulness or agreement between a measure or description and the phenomenon that it purports to represent does not help us at this point. Transactions here are not being misrepresented, they are being redesigned, at a cost, in order to achieve a desired, GAAP compliant reporting pattern.

subject to a self-fulfilling reliability choice of $\sigma_2^{R2} = \overline{\sigma}_2^2$ and incentive compatibility for the seller (i.e., maximization of A7 in the presence of conjectured reliability of $\overline{\sigma}_2^2$ and regulation b^R leads to choice σ_2^{R2} by the seller). Notice the seller's first-order condition reduces to:

$$-c'(\sigma_2^{R2}) - d'(\sigma_2^{R2},b^R) = \omega(b - \sigma_2^{R2}) - \upsilon(\sigma_2^{R2} - b^R) = 0$$

which implies the reliability choice as a function of regulation b^R is given by:

$$\sigma_2^{R2} = \frac{\omega b + \upsilon b^R}{\omega + \upsilon}.$$

Hence, for $b^R < b$ we have $b^R < \sigma_2^{R2} < b$.

Now examine the derivative of welfare with respect to b^R. With some simplification, we have:

$$\frac{dW(b^R)}{db^R} = \frac{\upsilon}{\omega + \upsilon}\left[-k\frac{\sigma_1^4}{(\sigma_1^2 + \sigma_2^{R2})^2} + \omega(b - b^R)\right].$$

From here, suppose the regulation is set such that $\sigma_2^{R2} = \sigma_2^{2*}$. This can be shown to imply $\frac{dW(b^R)}{db^R} > 0$ at this point; so $\sigma_2^{R2} > \sigma_2^{2}*$. Likewise, suppose we set $b^R = \sigma_2^{2*}$. Again, this can be shown to imply $\frac{dW(b^R)}{db^R} > 0$ at this point, so $b^R > \sigma_2^{2*}$.

Intuitively, the transaction redesign option requires the regulator to balance direct and indirect effects, resulting in a more lenient standard. The contrast with Proposition 1 is stark. In that setting, the best standard mimics the nearly classical solution of a well-functioning market. But in the Proposition 2 setting, the best standard moves away from this classical solution. It is more lenient than that standard and induces an even lower equilibrium supply of reliability. This occurs because the seller has multiple ways for dealing with the standard, and the efficient standard must anticipate how the seller uses these instruments. Moreover, since the regulation invites the use of the inefficient restructuring option, the regulatory burden is lessened because of this indirect effect. (It is as if compliance cost has increased.) It matters how the regulator perceives the problem, and approaching the issue by envisioning the transaction as taking place in a perfect market setting is simply not efficient.

Multiple Firms

Accounting standards and the Conceptual Framework, of course, owe their existence to multiple firms and a variety of market conditions. The familiar claim is that it is overly costly, if not impossible, for investors to understand the individual firms' reporting unless their reporting is standardized, and opportunism concerns lead to regulation of those standards. The question remains, however, whether the finer details matter and whether the accounting standards should reflect the anticipated equilibrium behavior of the firms in the economy. Proposition 2 answers this question in a single firm setting, but that is a partial answer. To dig deeper, it is necessary to extend the analysis to incorporate multiple firms. For our purpose, two firms will suffice.

Assume, then, we have two firms, each patterned after our single-firm case. When necessary, we distinguish between them using $i = 1$ or 2. All randomness is independent between the two firms, and the only difference between them is the marginal cost of transaction design, where we assume $\upsilon_1 \neq \upsilon_2$ though both are nonzero.

At this level, the two firms are identical with finer details as specified in the proceeding analysis. It then follows that the reliability choices are identical when those choices are publicly observable. No regulation is warranted in such a case.

But, when transaction redesign is an option and redesign costs differ across firms, we have a different picture. Here the welfare maximizing common standard reflects the collective anticipated response to the standard, which varies among the heterogeneous firms. We wind up with a common standard that is neither neutral nor particularly maximizing for one firm (seller) or the other. We summarize as follows:

Proposition 3: Assume $k > 0$, $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$, $\upsilon_1 \neq \upsilon_2$, and $\upsilon_i > 0$. Then the welfare maximizing common standard differs from what would be the welfare-maximizing standard for either firm.

Proof: The welfare of firm i is defined by:

$$W_i(b^R) = \mu - k\frac{\sigma_1^2\bar{\sigma}_{i2}^2}{\sigma_1^2 + \bar{\sigma}_{i2}^2} - c(\sigma_{i2}^{R2}) - d_i(\sigma_{i2}^{R2}, b^R)$$

where σ_{i2}^{R2} is firm i's optimal reliability choice in light of conjecture $\bar{\sigma}_{i2}^2$ and regulation b^R. And total welfare is the sum:

$$W(b^R) = W_1(b^R) + W_2(b^R).$$

In turn, differentiating total welfare leads to the sum of two expressions that parallel the expression developed in the proof of Proposition 2. But this (combined) expression cannot be zero at either single firm optimal standard, as at such a point only one term of the gradient total would equal zero.

REFERENCES

Antle, R., and J. Demski. 1989. Revenue recognition. *Contemporary Accounting Research* 5 (2): 423–451.

Beardsley, C., and J. O'Brien. 2004. The effectiveness of Britain's financial service authority: An economic analysis. Working paper, Carnegie Mellon University.

Bratton, W. 2007. Private standards, public governance: A new look at the financial accounting standards board. *Boston College Law Review* XLVIII (1): 5–53.

Christensen, J., and J. Demski. 2003. *Accounting Theory: An Information Content Perspective*. Columbus, OH: McGraw-Hill/Irwin.

Coase, R. 1960. The problem of social cost. *Journal of Law and Economics* 3: 1–44.

Demski, J. 1973. The general impossibility of normative accounting standards. *Accounting Review* 48 (4): 718–723.

———. 1981. Cost allocation games. In *Joint Cost Allocations*, edited by S. Moriarity. Norman OK: University of Oklahoma Center for Economic and Management Research.

Dye, R. 2002. Classifications manipulation and Nash accounting standards. *Journal of Accounting Research* 40 (4): 1125–1162.

———, and S. Sridhar. 2004. Reliability-relevance trade-offs and the efficiency of aggregation. *Journal of Accounting Research* 42 (1): 51–88.

Ewert, R., and A. Wagenhofer. 2005. Economic effects of tightening accounting standards to restrict earnings management. *Accounting Review* 80 (4): 1101–1124.

Financial Accounting Standards Board (FASB). 1978. *Objectives of Financial Reporting by Business Enterprises*. Statement of Financial Accounting Concepts No. 1. Stamford, CT: FASB.

———. 1980. *Qualitative Characteristics of Accounting Information*. Statement of Financial Accounting Concepts No. 2. Stamford, CT: FASB.

———. 1985. *Elements of Financial Statements—A replacement of FASB Concepts Statement No. 3*. Statement of Financial Accounting Concepts No. 6. Stamford, CT: FASB.

———. 2006. *Conceptual Framework for Financial Reporting: Objective of Financial Reporting and Qualitative Characteristics of Decision-Useful Financial Reporting Information*. Preliminary Views. Norwalk, CT: FASB.

Feltham, G. 1972. *Information Evaluation*. Sarasota FL: American Accounting Association.

Fischer, P., and P. Stocken. 2004. Effect of investor speculation on earnings management. *Journal of Accounting Research* 42 (5): 843–870.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005. The market pricing of accruals quality. *Journal of Accounting and Economics* 39 (2): 295–327.

Hirshleifer, J. 1971. The private and social value of information and the reward to inventive activity. *American Economic Review* 61 (4): 561–574.

———, and J. Riley. 1979. The analytics of uncertainty and information—An expository survey. *Journal of Economic Literature* 17 (4): 1375–1421.

Ijiri, Y., and R. Jaedicke. 1966. Reliability and objectivity of accounting measurements. *Accounting Review* 41 (3): 474–483.

Jorgensen, B., and M. Kirschenheiter. 2003. Discretionary risk disclosures. *Accounting Review* 78 (2): 449–469.

Kirschenheiter, M. 1997. Information quality and correlated signals. *Journal of Accounting Research* 35 (1): 43–59.

Maines, L., and J. Wahlen. 2006. The nature of accounting information reliability: Inferences from archival and experimental research. *Accounting Horizons* 20 (4): 399–425.

Marschak, J., and K. Miyasawa. 1968. Economic comparability of information systems. *International Economic Review* 9 (2): 137–174.

Sargent, T. 2001. *The Conquest of American Inflation*. Princeton: NJ: Princeton University Press.

Schipper, K. 2002. Implications of accounting research for financial reporting standard setting. Saxe Lectures in Accounting at Baruch College. Available at: http://newman.baruch.cuny.edu/digital/saxe/saxe_2002/schipper_2002.htm.

Solomons, D. 1991. Accounting and social change: A neutralist view. *Accounting, Organizations and Society* 16 (3): 287–293.

Stocken, P., and R. Verrecchia. 2004. Financial reporting system choice and disclosure management. *Accounting Review* 79 (4): 1181–1203.

Tetlow, R. J., and B. Ironside. 2006. Real-time model uncertainty in the United States: The fed from 1996–2003. Federal Reserve Board, unpublished.

Verrecchia, R. 1990. Information quality and discretionary disclosure. *Journal of Accounting and Economics* 12 (4): 365–380.

Wall Street Journal. 2004. Engine trouble: How miscalculations and hubris hobbled celebrated Google IPO. August 19.

Watts, R., 2006. What has the invisible hand achieved? Working paper, Massachusetts Institute of Technology.

Woodlock, P., and R. Young. 2001. The trade-off of reliability for relevance within a stewardship setting. *Managerial and Decision Economics* 22 (6): 315–326.

Zeff, S. 1978. The rise of economic consequences. *The Journal of Accountancy* 46 (6): 56–63.

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