The Non-Neutrality of Reporting Standards
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Abstract

The Conceptual Framework offers an approach to understanding and managing reporting choices and their regulation. Neutrality, 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 present an inter-generational trading model in which (1) relevance and reliability are well defined, (2) the reliability choice is of first order concern, and (3) the key to managing and regulating this choice is a focus on particular interests. Neutrality, that is, blinds the analysis.

Keywords: Conceptual Framework, reliability

1. Introduction

The Conceptual Framework (e.g., the FASB’s CON series) envisions design, regulation and intertemporal management of an entity’s financial measurement system in terms of the qualitative characteristics of relevance and reliability and their various derivative expressions such as representational faithfulness and neutrality. This approach 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 is at odds with the underlying economics, and has the added disadvantage of clouding the fact GAAP is a regulated enterprise.

Here we present a streamlined model in which the regulated nature of GAAP is apparent, and provide conditions under which anticipating the reporting firms’
response to a regulation is critical to designing the efficient regulation. This essential anticipation is at odds with the Framework’s neutrality theme, but follows Watts’ [2006] admonition that accounting regulators "anticipate how managers and others will react to any standards or proposed reforms" as well as Maines and Wahlen’s [2003] observation that accounting reliability issues "arise from the interactions between accounting standards and the incentives facing preparers."

The central feature of our argument is the view that accounting is a source of information, and not simply a benign measurement activity. The Conceptual Framework also views financial statements as a source of information1, but 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 problem that the user of the financial statements is facing (Demski [1973, 1981], Christensen and Demski [2003]). This substitution, however, is not likely to be error free.

In a single person setting, for example, the "best" information source depends on such things as the choices open to the individual, their risk, and the individual’s risk aversion. Finer details of the setting, meaning the underlying tastes, beliefs, and opportunities, have a great deal to say about which information source is best in the specified setting. The single exception to this broad statement is the special case where one information source de facto reports all that another does, but with added noise, a Blackwell comparison.2

By implication, then, except in the exceptional case, the best information source cannot be identified without identifying the finer details of the setting. Qualitative characteristics, however, are designed to gloss over, to keep a distance from, these finer details. Hence, the qualitative characteristics approach cannot,
by design, carry the essential economic details of the underlying resource allocation exercise.

In a trading or exchange setting, where multiple individuals are present, we encounter a more subtle version of this gulf between the Conceptual Framework’s approach and underlying economic forces, as the competing interests and choices of these multiple individuals are themselves part of the finer details. Here, as a response to the existence of competing interests, the Conceptual Framework has been refined by inclusion of a secondary qualitative characteristic of neutrality.³

Neutralitiy 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. (CON 2, paragraph 98)

Neutralitiy 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. (paragraph 100)

The IASB is even more specific in the definition and interpretation of the notion of neutrality.

In assessing neutrality the concept of prudence (conservatism) needs to be put in context. Prudence is the inclusion of a degree of caution
in the exercise of judgments needed in making the estimates required under conditions of uncertainty, such that assets or income are not overstated and liabilities or expenses are not understated. (IASB Framework §37).

It is emphasized that the exercise of prudence does not permit the deliberate understatement of assets or overstatement of liabilities, because the financial statements would then not be neutral. Neutrality also encompasses completeness, that is: “to be reliable information in financial statements must be complete within the bounds of materiality and cost” (§ 38).

In other words, the accounting should be "done well," 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 feedback effect.

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. (CON 2, paragraph 102)

While appealing, this vision of neutrality ignores the possibility transactions, not to mention trading arrangements, may well be designed in response to and even in anticipation of a particular reporting standard. Stated differently, the underlying "finer details" matter, and the accounting standards affect the finer details in a trading setting.

The concern, then, is the supply of transactions and what we know about them. 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. Transactions, that is, are often designed to exploit if not avoid a regulatory dictate.

Here we analyze an inter-generational trading setting that is designed to highlight this neutrality issue. The setting is constructed so (1) the primary issue is the valuation of an asset, (2) the finer details are evident, and (3) the primary characteristics of relevance and reliability of information conveyed by compliance with a reporting standard are equally evident. In this manner the notions of relevance and reliability per se are not at issue (though they would be in a less
streamlined setting). Moreover, the variance of an estimator turns out to be the natural measure of reliability. It also turns out that the socially preferred reliability choice, in the form of a reporting standard, is heavily dependent on the individuals' responses to the reporting standard. That is, the regulator or standard setter's anticipation of the reporting organization's response to the reporting standard is central to the analysis.

The reporting standards thus become endogenous, and their design must be cognizant of its effect on particular interests and their responses to the standard. From this perspective the concept of neutrality is misleading. An "equilibrium perspective" is more appealing, as the desirability of a reporting standard depends critically on the underlying finer details and consequent behaviors, on the collective consequences of the standard, including redesign of the underlying transactions.4

As will become clear, the center piece of our streamlined model 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], and 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 [2003]), as well as studies such as Francis et al [2005], that are concerned with the pricing of information quality.

Closest to our work are Dye [2000] and Dye and Sridhar [2004]. In Dye [2000], an aggregation or coarsification standard can, with costly transaction restructuring, be muted; and this leads, in equilibrium, to a shadow standard. We introduce a similar possibility and effect late in the present analysis. In Dye and Sridhar
[2004], "hard" and "soft" information are linearly combined, creating a relevance versus reliability tension given the attendant aggregation. No such tension is present here, by design. Our focus is exclusively confined to the accounting report’s reliability, measured by the variance of its underlying error process. This, it turns out, is sufficient to exhibit the non-neutrality theme that is our concern. Similarly, Kirschenheiter [1997] focuses on two information sources in order to exhibit relevance and reliability characteristics, while we focus on a single source in order to cleanly exhibit the non-neutrality theme.

Our model is presented in Section 2, followed by a series of extensions and analyses in Sections 3 and 4 that are designed to explore the non-neutrality theme.

2. Model

Consider an individual entrepreneur or seller who owns an asset that must, for inter-generational reasons, be sold to an investor or buyer. We treat the asset’s value and pending trade as exogenous simply to avoid clutter in what follows.

The asset’s (gross) value, denoted \( \tilde{V} \), is a normal random variable, with (strictly positive) mean \( \mu \) and variance \( \sigma_1^2 \). Think of this value as given by the mean plus a random shock term, or

\[
\tilde{V} = \mu + \tilde{\epsilon}_1
\]

where \( \tilde{\epsilon}_1 \sim N(0, \sigma_1^2) \). Prior to selling, the seller produces a publicly observed signal \( \tilde{y} \), an estimate of the asset’s value, given by

\[
\tilde{y} = \tilde{V} + \tilde{\epsilon}_2
\]

where \( \tilde{\epsilon}_2 \sim N(0, \sigma_2^2) \). The two shock terms, \( \tilde{\epsilon}_1 \) and \( \tilde{\epsilon}_2 \), are independent. Any would-be buyer lacks access to any other information source, and thus relies ex-
clusively on the seller’s estimate of value. 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 non-neutrality theme with minimal baggage.) The sole reporting issue is the noise in the value estimate in (2). This noise is measured by the variance of the noise term, \( \sigma_2^2 \), and using the language of the Conceptual Framework is interpreted as the reliability of the estimate. (Lower variance, then, means more reliability.)

2.1. 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 the asset’s gross value is a normal random variable with mean \( E[\hat{V}|y] = \mu + \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2} (y - \mu) \) and variance \( \hat{\sigma}^2 = \frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2} \). 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:

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

(3)

One interpretation is the asset is sold in a market where risk is priced, and given the assumption of normal random variables, risk is measured by variance and priced in the noted fashion. A second interpretation is risk neutral pricing prevails, but the asset’s (net) value depends on its expected gross value adjusted for how well the new owner is able to manage the asset. This ability, in turn, decreases with the "amount" of uncertainty surrounding the gross value. In effect, the net value is the conditional expected value of \( \hat{V} \) less a discount of \( k \hat{\sigma}^2 \). Thus,
there is an informational disadvantage associated with the new ownership. This latter interpretation aids intuition in what follows.\(^5\)

In turn, the \(a \text{ priori}\) value variance or uncertainty, \(\sigma_1^2\), is exogenous, but the signal variance or "reliability," \(\sigma_2^2\), is endogenous. Prior to observation of signal \(y\), the current asset holder, the seller, chooses \(\sigma_2^2\) in anticipation of its effect on the selling price, net of his personal cost. Maintaining the common knowledge assumption, the seller’s choice of \(\sigma_2^2\), his reliability choice, is publicly observed. This implies that, prior to observation of \(y\), the 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 \(-\frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}\), both of which depend on the choice of \(\sigma_2^2\).

To simplify the analysis, the seller is risk neutral. Let \(c(\sigma_2^2)\) denote his personal cost of supplying "reliability" of \(\sigma_2^2\), where \(\sigma_2^2\) is constrained to be within a feasibility region of \(\sigma_2^2 \in [a, b]\). So the maximal (minimal) reliability is \(\sigma_2^2 = a(= b)\). Moreover, as lowering the variance is costly, \(c(\sigma_2^2)\) is a decreasing function of \(\sigma_2^2\), or \(c'(\sigma_2^2) < 0\).

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

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

subject, of course, to the feasibility region of \(\sigma_2^2 \in [a, b]\). Let \(\sigma_2^2^*\) denote the seller’s optimal choice.\(^6\)

Notice the seller’s trade-off. Reliability 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.⁷ We emphasize the simplicity of the setting. It is possible to treat the seller as risk averse as well, setting 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, the market price of an equity security.

We presume an interior solution to the seller’s dilemma, e.g., the personal cost function is well behaved. Thus, with suitable regularity, and presuming an interior solution, the reliability choice is given by the following first-order condition for maximizing the seller’s expected gain in (4):

\[
(-k) \frac{\sigma_1^4}{(\sigma_1^2 + \sigma_2^2)^2} - c'(\sigma_2^2) = 0
\]

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

\[
c(\sigma_2^2) = \omega \frac{(b - \sigma_2^2)^2}{2}
\]

where, again, \(\sigma_2^2 \in [a, b]\). (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 is well defined, we also assume

\[
\omega > 2k\sigma_1^4/(\sigma_1^2 + a)^3
\]

These assumptions are maintained throughout.
We now have the following sufficient conditions to ensure an interior solution to the seller’s problem, that the trade-off between information value and cost is nontrivial.\textsuperscript{8}

\textbf{Lemma 1} The seller’s optimal reliability choice in the public setting, $\sigma_2^2$, is strictly interior if (1) $k > 0$ and (2) $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$.

To illustrate, let $k = 7$, $\mu = 1,000$, $\sigma_1^2 = 100$, $\omega = .04$, and $\sigma_2^2 \in [75, 150]$. We find an interior solution of $\sigma_2^2 = 110.51$, along with a net to the seller, relation (4), of 601.34. Further observe $k = 7 > 0$ and $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 = -21,875 < 0$.

It is also of interest to isolate the connection between the seller’s reliability choice and the discount parameter, $k$. We have:\textsuperscript{9}

\textbf{Lemma 2} If the seller’s optimal reliability choice is strictly interior in the public setting, $\sigma_1^2 + 3a - 2b > 0$ implies $\partial\sigma_2^2 / \partial k < 0$.

Intuitively, increasing the discount induces, at the margin, more reliability. The informational disadvantage of the buyer is increased and the seller responds accordingly in his reliability choice.

Notice, however, that pricing the buyer’s information advantage or risk, $k$, is important here. Suppose $k = 0$. In the public case, glancing back at (4) it is clear we would then have $\sigma_2^2 = b$. This minimizes the seller’s risk, and simultaneously guarantees a reliability cost of zero. The information tension disappears.

2.2. qualitative characteristics

Stepping back, the model is designed so the public information in (2) can be interpreted as an accounting measure or estimate of value. In this fashion,
variable \( y \), the public observable, is simultaneously a source of information and an accounting measure; and its timing is fixed, by assumption.

Returning to the Conceptual Framework, this public information is relevant if it has the "...capacity ... to make a difference in a decision..." and it is reliable to the extent it is "... reasonably free from error and bias and faithfully represents what it purports to represent." Glancing back at the pricing equation in (3), we have

\[
\frac{\partial P(y)}{\partial y} = \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}
\]

The pricing (decision) varies linearly with the information as long as the variance term, \( \sigma_2^2 \), is bounded. And since the variance is bounded, by assumption, the information in (2) 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 \( \sigma_2^2 \) variance, is central to the analysis. The weight assigned to measure \( y \) in revising the estimate of value (the "signal response coefficient" of \( \frac{\sigma_2^2}{\sigma_1^2 + \sigma_2^2} \)) in the pricing equation, the buyer's residual uncertainty discount in the pricing equation (the \( k \frac{\sigma_2^2}{\sigma_1^2 + \sigma_2^2} \) term), and the seller's welfare (See (4).) all depend on \( \sigma_2^2 \), on the reliability choice. We do not, however, face a reliability versus relevance trade-off, simply by design.

Reliability, then, is well defined, is a first order effect, and is a choice variable. 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 or information disadvantage on the buyer. Further notice that, with the presumed competitive pricing, the buyer is price protected, all the gains to trade are realized by the seller, and, thus, the seller's reliability choice is, indeed, welfare maximizing. Moreover,
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regulation of that choice is a moot issue, because (in the tradition of Coase) the choice is observable and made by the one who captures all the gains to trade.

In a sense, public observation of the reliability choice reflects the Conceptual Framework’s approach to resolution of reporting issues: identifying the measure or accounting estimate (e.g., fair value) that would emerge were this transaction taking place in a relatively friction free, or classical, market setting. More precisely, a reporting standard in our setting would consist of an upper bound on the possible choice of $\sigma^2$, i.e., a minimal allowable reliability. And the reporting standard is neutral if it mimics the public observation case:

**Definition 1** Reporting standard $b < b$, which constrains the variance choice to $\sigma^2 \in [a, b]$ is neutral if $b = \sigma^2$, the solution to the public observable, classical market setting.

This provides a definition of neutrality, as particular interests are precluded from entering the reporting choice. It has the advantage of being welfare maximizing, given classical market settings. And it also respects the qualitative characteristics approach by focusing on classical market conditions, as opposed to whatever trade arrangements are indeed present. Of course, neutrality is also concerned with freedom from bias and not simply the resulting reliability. However, in our setting these two are equivalent. In a reporting equilibrium bias is equivalent to the information content in the report being lower and that leads to less correlation with the relevant variable. This again is a statement about the reliability of the accounting measure or the variance.
3. private reliability choice

We now turn to the setting where the seller’s reliability choice is not publicly observed. One way to proceed is to model the market reaction to the unobservable choice of reliability as a rational expectations equilibrium. That is, the "market" anticipates a reliability choice denoted $\sigma_2^2$. This implies a pricing function of

$$P(y|\sigma_2^2) = \mu + \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}(y - \mu) - k \frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2}$$

where the mean and variance conjectures reflect the anticipated reliability choice of $\sigma_2^2$. Importantly, the risk that is priced is now the conjectured risk, and the "signal response coefficient," $\frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2}$, reflects the conjectured as opposed to the actual reliability choice.

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

$$\mu - k \frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2} - c(\sigma_2^2)$$

again subject to $\sigma_2^2 \in [a, b]$. And we conclude the reliability choice is now characterized by

$$-c'(\sigma_2^2) = 0$$

Let $\sigma_2^{2*}$ denote the equilibrium reliability in the private setting. Given the assumed cost function the seller now supplies minimal reliability, i.e., maximal variance of $\sigma_2^{2*} = b$. With the reliability choice unobservable there is no way the market’s risk adjustment can reflect the actual reliability choice and consequently the seller (correctly) foresees no connection between his reliability choice and either
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the market’s risk adjustment or the resulting "signal response coefficient." And with no explicit information effect on the buyer, the seller foresees no return to reliability. The implicit link to the equilibrium choice of $\sigma^2_2$ is not sufficient to control the seller and induce a reliability choice that is an interior point in $[a, b]$. To illustrate, returning to the earlier illustration where, recall, we had a public reliability choice of $\sigma^2_2^* = 110.51$ and attendant welfare measure of 601.34. In the private setting, however, we have a self-fulfilling reliability conjecture of $\sigma^2_2^* = 150 > 110.51$; and the seller’s welfare drops from 601.34 to 580. This reflects the fact that the market’s reliance on conjectured as opposed to actual choice places the seller in an awkward position where costly information is not rewarded.

Intuitively, in the public setting the seller recognizes the effect his $\sigma^2_2$ choice has on the equilibrium pricing function, while any such direct effect is moot in the private case. Rather, it is his privately executed incentive compatible choice that is priced; and in our streamlined setting this is the corner solution of minimal reliability. Stated differently, if the market cannot verify the seller’s reliability choice, it must rely on his conjectured choice; and results in minimal reliability in equilibrium. This comparison of the public and private cases is highlighted in Lemma 3.

**Lemma 3** Minimal reliability is supplied in the private setting. Moreover, (1) $k > 0$ and (2) $k\sigma_4^4 - \omega(b - a)(\sigma_2^4 + a)^2 < 0$ imply $\sigma_2^2 = b > \sigma_2^2^*$.  

4. regulated reliability choice

Gains to trade are present in this setting, and measured by the expected value of the asset in the buyer’s hands, less the value reduction associated with the residual
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uncertainty, and, of course, less the information production cost. This is, in fact, expression (4), our original expression for the seller’s perspective. 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, now, the welfare measure is higher when the seller’s reliability choice is public. And 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 $\sigma^2 \in [a, \hat{b}]$, where $a < \hat{b} < b$. Presuming costless and error free enforcement, this implies an equilibrium variance upper bounded by $\hat{b} < b$.

If the regulator is adroit and unconstrained, he can proceed in neutral fashion and set $\hat{b} = \sigma^2_{\ast}$, the optimal choice in the public setting. This, of course, is welfare maximizing in this particular setting. And the more modest goal of simply improving welfare is encouraging.

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

Proposition 1 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. The solution is free of particular interests; it is neutral. And this is precisely what we want the regulator to do in this setting. Moreover, even if the regulator errs in identifying the classical market solution,
merely moving the reporting in that direction is socially desirable. Unfortunately, this conclusion rests on the reporting firm, the seller, having no additional instruments with which to confront the regulator’s dictate.

4.1. regulated choice coupled with designer transactions

From here we place a second instrument in the seller’s hands, by assuming the regulator announces a regulatory constraint of \( \sigma_2^2 \in [a, \hat{b}] \), but the seller is able, at a cost, to "restructure" the underlying transactions so they have the appearance of satisfying the regulatory constraint.\(^{10} \)

In particular, suppose the seller can create the appearance of compliance, but actually set \( \sigma_2^2 > \hat{b} \) by incurring cost \( \tilde{c}(\sigma_2^2, \hat{b}) \), where

\[
\tilde{c}(\sigma_2^2, \hat{b}) = \begin{cases} 
\frac{\omega}{2}(\sigma_2^2 - \hat{b})^2 & \text{if } \sigma_2^2 \geq \hat{b} \\
0 & \text{otherwise}
\end{cases}
\]

The buyer, of course, anticipates such behavior and conjectures a reliability choice of \( \sigma_2^2 \). We are back to the pricing expression in (6), and paralleling (7) the seller now selects his reliability to maximize

\[
\mu - k\frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2} - c(\sigma_2^2) - \tilde{c}(\sigma_2^2, \hat{b})
\]

Presuming an interior solution, in equilibrium, we now have the seller using a mixture of reliability "investment" and costly transaction restructuring to satisfy the regulator’s promulgation.

4.2. extended illustration

To explore this further, return to our illustration and assume the regulator sets \( \hat{b} = 100 \) (in the private setting, of course). As summarized below, this ensures
an expected and actual choice of $\sigma_2^2 = 100$ in the private setting of Proposition 1. Conversely, suppose the transaction can be redesigned, at cost $.02(\sigma_2^2 - \hat{b})^2$ (so $\hat{\sigma} = .04$). The seller now exploits a mixture of compliance and transaction redesign, and the resulting equilibrium reliability is $\sigma_2^2 = 125$. In terms of welfare, we find a measure, recall, of 601.34 in the public case and 580 in the unregulated private case. Setting $\hat{b} = 100$ absent any transaction redesign option provides a measure of 600 $>$ 580 (Recall Proposition 1.), but setting that standard in the presence of the redesign option provides a welfare measure of 586.11. Notice the regulation is welfare improving even though the regulator is faced with the possibility of designer transactions.

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<th>classical</th>
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<th>regulated</th>
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<td>welfare</td>
<td>601.34</td>
<td>580</td>
<td>600</td>
<td>586.11</td>
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More expansively, we plot the welfare measure versus the $b$ upper bound in Figure 1. As is apparent, the regulation affects transactions, and simply presuming the best choice of $\hat{b}$ is the one that maximizes welfare absent the transaction redesign option is naive. Indeed, the actual reliability that is supplied by the seller is strictly less than that mandated by the regulator’s pronouncement; the regulator’s mandate is not self-fulfilling. Moreover, the welfare maximizing reliability standard here, given the regulator or standard setter anticipates transaction redesign ($\hat{b} \approx 118.05$), is less stringent than its neutral counterpart in the public or first-best setting ($\sigma_2^2^* = 110.51$), and the actual, equilibrium reliability is $\hat{\sigma}_2^2 = 134.02$.

Equally apparent is the fact, given a specified regulation, the transaction redesign option is not welfare improving. The difficulty is the seller cannot commit
not to use the option. More importantly, however, efficient regulation is affected by whether the option is present.\(^{11}\)

4.3. equilibrium perspective

The important point in the illustration is the failure of the Conceptual Framework’s approach. Basing the regulation on the "perfect market" or neutral solution is inefficient. The regulation should not be set as though the "perfect market" setting were present, i.e., set \( b = \sigma_2^2 \), 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 neutral reliability choice of \( \tilde{\sigma}_2^2 = \sigma_2^2 \) obtains. This follows
from the fact the firm, the seller, has an additional instrument for dealing with the regulation. And an efficient regulation requires anticipation of how that instrument 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.12

We summarize as follows, where $\sigma^2_2$ denotes the equilibrium supply of reliability under regulation $\tilde{b}$ and, recall, $\sigma^*_2$ denotes the neutral, perfect market reliability choice:

**Proposition 2** Assume (1) $k > 0$ (2) $k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0$ and (3) $\tilde{\omega} > 0$. Then (1) $\sigma^2_2 > \tilde{b}$ if $\tilde{b} < b$; (2) the optimal regulation induces $\sigma^2_2 > \sigma^*_2$; and (3) the optimal regulation exhibits $\tilde{b} > \sigma^*_2$.

Intuitively, the transaction redesign option requires the regulator balance direct and indirect effects, resulting in a more lenient standard. The contrast with Proposition 1 is stark. In that setting, the best standard (the neutral 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 and reflects the equilibrium reaction to the standard. It matters how the regulator perceives the problem.

5. Conclusion

The Conceptual Framework invites a 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 also relegates the supply of transactions to second order concern. The
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Qualitative characteristics are fundamental to the Framework but are largely concerned with the accounting information per se. This way it is neutral, as particular interests are left out of view. Yet, many of the reporting details are potentially driven by the reporting standard in conjunction with the particular interests of the reporting organization. Furthermore, the reporting organization is better informed than the rest of the players and also has private reporting incentives. This opens a feedback loop which is not easy to control by means of good intentions. The neutrality stance of the Framework mutes if not blinds the analysis to these reactive effects, and, as a consequence, is an unacceptable platform for instruction or regulation.\textsuperscript{13}

To be effective, the Framework must, in our view, adopt an equilibrium perspective. Regulation must balance the reporting incentives, the supply of transactions, and the use of accounting reports. That is, recognition of the finer details of the reporting problem are important, including the equilibrium supply of transactions.

To be sure, we have modeled this phenomenon in most simple fashion. Natural extensions include (1) dynamics wherein regulatory moves are anticipated via preemptive transaction design, (2) vector specification of reporting choices and standards, with attendant concern for the classical theory of the second best, (3) heterogeneous entities, entailing "winners" and "losers" in the non-neutrality sweepstakes; and (4) decentralized managers with endogenous incentives. But the issue remains: transactions are far from exogenous, and there is much more to financial reporting than the Conceptual Framework suggests or implies.\textsuperscript{14}
6. Appendix

6.1. proof of Lemma 1

With \( c(\sigma_2^2) = \frac{\omega}{2}(b - \sigma_2^2)^2 \), the first order condition in (5) evaluated at \( \sigma_2^2 = b \) is negative if \( k > 0 \). Conversely, with \( k > 0 \), it is positive when evaluated at \( \sigma_2^2 = a \) provided \( k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0 \).

6.2. proof of Lemma 2

With a strictly interior reliability choice, rewrite (5), with \( c'(\sigma_2^2) = -\omega(b - \sigma_2^2) \):

\[-k\sigma_1^4 + \omega(b - \sigma_2^2)(\sigma_1^2 + \sigma_2^2)^2 = 0\]

Totally differentiating reveals the sign of \( \partial \sigma_2^2* / \partial k \) is determined by the sign of

\[-(\sigma_1^2 + \sigma_2^2) + 2(b - \sigma_2^2) = -\sigma_1^2 + 2b - 3\sigma_2^2, \]

which is negative if \( \sigma_1^2 + 3a - 2b > 0 \).

6.3. proof of Lemma 3

(8) implies \( \sigma_2^2 = b = \sigma_2^2* \). With \( k > 0 \) and \( k\sigma_1^4 - \omega(b - a)(\sigma_1^2 + a)^2 < 0 \), Lemma 1 ensures \( \sigma_2^2* \) is interior, or \( \sigma_2^2* > \sigma_2^2* \).

6.4. proof of Proposition 1

Lemma 3 implies \( a < \sigma_2^2* < b \) and \( \sigma_2^2 = b \). Continuity now ensures we can find an interval such that any \( \hat{b} \in (\frac{b}{2}, \sigma_2^2) \) is welfare improving.
6.5. proof of Proposition 2

Lemma 1 guarantees $\sigma_2^{2*}$ is strictly interior. From here the proof follows by maximizing welfare, as defined in (9)

$$W(\sigma_2^2, \hat{b}) = \mu - k \frac{\sigma_2^2 \sigma_1^2}{\sigma_1^2 + \sigma_2^2} - c(\sigma_2^2) - \tilde{c}(\sigma_2^2, \hat{b})$$

subject to a self-fulfilling reliability choice of $\sigma_2^2 = \sigma_2^2$ and incentive compatibility for the seller (i.e., maximization (9) in the presence of conjectured reliability of $\sigma_2^2$ and regulation of $\hat{b}$). Notice the seller’s first order condition reduces to

$$-c'(\sigma_2^2) - \tilde{c}'(\sigma_2^2, \hat{b}) = \omega(b - \sigma_2^2) - \tilde{\omega}(\sigma_2^2 - \hat{b}) = 0$$

which implies the reliability choice as a function of regulation $\hat{b}$ is given by

$$\hat{\sigma}_2^2(\hat{b}) = \frac{\omega \hat{b}}{\omega + \tilde{\omega}}$$

Hence, for $\hat{b} < b$ we have $\hat{b} < \hat{\sigma}_2^2 < b$.

Now examine the derivative of welfare with respect to $\hat{b}$. With some simplification we have

$$\frac{dW(\hat{\sigma}_2^2(\hat{b}), \hat{b})}{d\hat{b}} = \frac{\tilde{\omega}}{\omega + \tilde{\omega}}(-k \frac{\sigma_1^2}{(\sigma_1^2 + \hat{\sigma}_2^2(\hat{b}))^2} + \omega(b - \hat{b}))$$

From here, suppose the regulation is set such that $\hat{\sigma}_2^2(\hat{b}) = \sigma_2^{2*}$. (5) now implies this derivative is

$$\frac{\tilde{\omega}}{\omega + \tilde{\omega}}(-\omega(b - \sigma_2^{2*}) + \omega(b - \hat{b})) > 0$$
Hence, the optimal regulation induces $\sigma_2^2 > \sigma_2^{2*}$. Finally, evaluating the derivative at the point $\tilde{b} = \sigma_2^{2*}$ we also find a positive value. This is easily seen from (5) since $\tilde{b} < \sigma_2^{2}$ implies $\frac{\sigma_1^2}{(\sigma_1 + \sigma_2^2)} < \frac{\sigma_1^{2*}}{(\sigma_1 + \sigma_2^{2*})}$ while $\omega(b - \tilde{b}) = c'(\sigma_2^{2*})$ when $\tilde{b} = \sigma_2^{2*}$. Consequently welfare is increasing in $\tilde{b}$ at the point $\tilde{b} = \sigma_2^{2*}$, and the optimal regulation thus exhibits $\tilde{b} > \sigma_2^{2*}$.

7. References


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Notes

1Consider Con 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."

2The Blackwell ordering refers to the fact one information source is superior to another regardless of finer details of the setting if and only if the possible signals from the second can be modeled as if they are statistically equal to those of the first plus noise. In turn, "finer details" refers to the totality of the economic setting that is essential for identifying the prominent or first-order economic forces at play.

Somewhat casually, suppose there is an uncertain event that can take on one from among a given list of possible events. Denote the possible events by the set \( \{ \theta_1, \theta_2, \ldots, \theta_m \} \) for some \( m > 1 \). In turn, an experiment or information
source is available. It will result in one possible observation from among the set \( \{ z_1, z_2, ..., z_n \} \) for some \( n > 1 \). The probability that observation \( z_i \) is observed if event \( \theta_k \) is true is denoted \( \pi_{ik} \) (for \( k = 1, ..., m \) and \( i = 1, ..., n \) of course). Now suppose a second experiment or information source is also possible. It will result in one possible observation from among the set \( \{ \hat{z}_1, \hat{z}_2, ..., \hat{z}_n \} \) for some \( n > 1 \). The probability that observation \( \hat{z}_j \) is observed if state or event \( \theta_k \) is true is denoted \( \hat{\pi}_{jk} \). Think of this as a choice between experiment \( \Pi \), the first, and experiment \( \hat{\Pi} \), the second.

It turns out experiment \( \Pi \) is as good as experiment \( \hat{\Pi} \) regardless of remaining details if and only if there exist real numbers \( b_{ij} \geq 0 \) for \( i = 1, ..., n \) and \( j = 1, ..., \tilde{n} \) such that (1) \( \sum_{j=1}^{\tilde{n}} b_{ij} = 1 \) for all \( i = 1, ..., n \) and (2) \( \hat{\pi}_{jk} = \sum_{i=1}^{n} b_{ij} \pi_{ik} \). That is, experiment one is as good as experiment two regardless of finer details is equivalent to the claim the second can be represented as if it were the first coupled with additional, strictly gratuitous noise. See, e.g., Marschak and Miyasawa [1968] or Christensen and Demski [2003].

Moreover, most experiments or information sources are non-comparable in the Blackwell sense. For example, aggressive versus conservative recognition of revenue are non-comparable 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 non-comparability, we simply cannot rely on the easy way out of so-called qualitative characteristics.
Though neutrality is portrayed as a secondary characteristic of reliability along with verifiability and representational faithfulness, we stress that the theme of our analysis is not a particular secondary characteristic, but the broader issue of whether the Framework is an adequate foundation. In a technical sense, we know the answer is negative, as qualitative characteristics per se are not up to the task. But the issue on which we focus is 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.

Returning to the cited CON 2, paragraph’s concern for "bias," it is important to distinguish the single- from the multi-person setting. We refer to an estimator as biased when systematic as opposed to utterly random noise is present. In a single-person setting, then, we simply remove the exogenous bias from the estimator, presuming we know its magnitude. But in a multi-person setting, adding noise to an observable has the effect of reducing the amount of communication; less information is thereby provided. The receiver, then, deals, as best he can, with the thus "noised up" information. For example, in Kirschenheiter’s [1977] model where a reporting firm has the option to report whichever of two signals is the most favorable, the market participants understand and act upon the fact truncation of a second signal is at work. This is not bias, it is strategically reduced communication. Thus, bias is not the issue; rather, what is to be communicated is the issue.

The recent 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, August 19, 2004).
(4) 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] and Beardsley and O’Brien [2004]) or market failure in the extreme are not present, by design.

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

In contrast, suppose the seller is strictly risk averse and selects $\sigma_2^2$ to maximize the expected value of the selling price, $E[P|\sigma_2^2]$, less $p$ times its variance, $pVAR(P|\sigma_2^2)$, and less the information production cost: This implies a focus on the following criterion:

$$E[P|\sigma_2^2] - pVAR(P|\sigma_2^2) - c(\sigma_2^2) = \mu - k \frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2} - p \frac{\sigma_1^4}{\sigma_1^2 + \sigma_2^2} - c(\sigma_2^2)$$

With a few additional restrictions, all that follows also follows in this expanded setting. The additional nuance is better information also exposes the seller to personally costly price risk, yet another variation on the well traveled road that not too much and not too little information in a multiperson setting is to be expected.

We are indebted to Anil Arya for the suggestion, in the interest of simplicity, that we treat the seller as risk neutral.

This comparative static observation is intuitively similar to the cutoff point analyses in Verrecchia [1990] and Kirschenheiter [1997].

Dye [2000], recall, emphasizes the importance of "shadow standards" by en-
dowing 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 Kircheneheiter [2003] model equilibrium pricing when 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.

11 This one-sided conclusion also reflects the fact we have a modest information tension. If the seller is also risk averse, the redesign option may be welfare improving, depending on the regulation.

12 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 are not here being mis-represented, they are being redesigned, at a cost, in order to achieve a desired, GAAP compliant reporting pattern.

13 Of course this is not to imply regulators themselves are naive. Consider the admonition in SFAS 150 about altering instruments for the purpose of circumventing the standard. Nonetheless, 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 (Wall Street Journal, May 12, 2005).

14 Continuing, 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 (Proposition 1). But if they can be redesigned, the welfare maximizing perspective is to treat the transaction redesign as a first order effect and adopt a fixed point perspective (Proposition 2).