

Discussion of “The Economics of Setting Auditing Standards”*

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1. Introduction

Ye and Simunic (2013; hereafter YS) analyze the preferences of investors and auditors for auditing standards. YS model two dimensions of auditing standards — toughness and vagueness. The standards come to bear in the event of an audit failure, which, in their model, corresponds to a “bad project” that escaped detection. “Toughness” refers to the typical level of effort that would be judged adequate and therefore protect the auditor from liability in the event of an audit failure. “Vagueness” refers to variation around the “toughness” level due to, for example, uncertainty about how a particular jury might interpret the standards. YS predict that vagueness can mitigate the costs of an inability to optimally set a bright-line standard. Such an inability might arise from, for example, technical constraints or heterogeneity in auditor wealth. They also predict that investors and auditors share preferences for standards, rendering it somewhat irrelevant which party sets standards.

This discussion focuses on two aspects of YS. In section 2, I highlight the trade-off between the auditor’s costs of effort and liability. Audit standards impact the auditor’s effort, which drives the investors’ and auditors’ preferences for standards. As a result, understanding the trade-off that determines effort plays an important role in understanding their study. In section 3, I discuss how enriching the model with heterogeneous auditors can alter some of the model’s predictions by inducing disagreement between investors and auditors over standards. Section 4 provides concluding remarks.

2. The key forces in the model

The auditor’s effort choice drives the model’s predictions, so I begin by summarizing the auditor’s effort and its impact on the preferences for auditing standards. Investors have the opportunity to invest in a project that requires an upfront investment of I and will pay B (“good project”) with probability β , and zero (“bad project”) with probability $1 - \beta$. Absent any information, the project has a positive net present value (NPV; i.e., $\beta B > I$). Investors can hire an auditor who generates a binary signal about the project with the following informational properties that depend on the auditor’s effort $a \in [0, 1]$:

$$P\left(\begin{array}{c} \text{Bad} \\ \text{project} \end{array} \middle| \begin{array}{c} \text{Bad} \\ \text{signal} \end{array}\right) = 1, \quad P\left(\begin{array}{c} \text{Good} \\ \text{project} \end{array} \middle| \begin{array}{c} \text{Good} \\ \text{signal} \end{array}\right) = \frac{\beta}{1-a(1-\beta)} > \beta \quad (1).$$

The structure follows from assuming that a good project always yields a good signal and a bad project yields a bad signal with probability a . Investors will fund the project after a good signal, but not after a bad signal.

If investors hire the auditor, they pay a noncontingent fee F and can sue in the event of the failure to detect a bad project (audit failure). Absent an auditor, the investors’

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expected payoff equals $\beta B - I$. Given conjectured auditor effort level \hat{a} , their expected payoff with an audit equals

$$\beta B - (1 - (1 - \beta)\hat{a})I - F + E[\text{Litigation}; \hat{a}] \tag{2}.$$

The auditor incurs effort cost $\frac{c}{2}a^2$ and selects effort to maximize his payoff of

$$F - E[\text{Litigation}; \hat{a}] - \frac{c}{2}a^2 \tag{3}.$$

The auditor has no private information so that the investors’ conjectured effort level \hat{a} will correspond to the auditor’s effort choice that maximizes (3). Combining (2) and (3), the incremental value of the audit is

$$\underbrace{\beta B - \beta I - (1 - \beta)(1 - a)I}_{\text{Expected total payoff with audit}} - \underbrace{\frac{c}{2}a^2}_{\text{Cost of auditor's effort}} - \underbrace{(\beta B - I)}_{\text{Expected payoff without audit}} = \underbrace{(1 - \beta)aI}_{\text{Value from avoiding funding of bad project}} - \underbrace{\frac{c}{2}a^2}_{\text{Cost of auditor's effort}} \tag{4}.$$

Expression (4) yields the first-best effort $a^* = (1 - \beta)I/c$.

The auditor’s and investors’ preferences for standards ultimately depend on their own expected payoffs. Comparing (2) to investors’ no-audit value of $\beta B - I$ implies that investors gain $(1 - \beta)\hat{a}I - F + E[\text{Litigation}; \hat{a}]$ from the audit and will pay no more than $\bar{F} = (1 - \beta)\hat{a}I + E[\text{Litigation}; \hat{a}]$. From (3) and the effort choice \hat{a} , the auditor will demand at least $\underline{F} = \frac{c}{2}\hat{a}^2 + E[\text{Litigation}; \hat{a}]$. Denoting the auditor’s bargaining power by $\lambda \in [0, 1]$, the fee F can be stated as

$$F = \underline{F} + \lambda(\bar{F} - \underline{F}) = (1 - \lambda)\frac{c}{2}\hat{a}^2 + \lambda(1 - \beta)\hat{a}I + E[\text{Litigation costs}; \hat{a}] \tag{5}.$$

Substituting from (5) back into the investors’ and auditor’s payoffs yields

$$\begin{aligned} \text{Investors' expected payoff: } & \beta B - I + (1 - \lambda)\left((1 - \beta)\hat{a}I - \frac{c}{2}\hat{a}^2\right), \\ \text{Auditor's expected payoff } & \lambda\left((1 - \beta)\hat{a}I - \frac{c}{2}\hat{a}^2\right) \end{aligned} \tag{6}.$$

Comparing (6) to (4) shows that, regardless of the fee, both the investors’ and the auditor’s ex ante preferences align with the first-best. Each gets a share of the surplus generated by the audit and, in the setting of YS, that share does not vary with auditing standards, as in Schwartz 1998.

Standards come into play because of their impact on the auditor’s effort. While the auditor’s ex ante effort preference comports with first-best, the ex post effort choice from (3) reflects a trade-off between the auditor’s expected litigation costs and costs of effort. The audit standards impact the expected litigation costs. In particular, in the event of an audit failure, the court will find the auditor guilty if the effort a falls short of a threshold s . If found liable, the auditor must pay $\min\{W, I\}$, where W denotes the auditor’s wealth. The threshold is uncertain, which YS parameterize as following a uniform distribution on the interval $m \pm \sigma\sqrt{3}$.¹ The parameter m denotes the overall “toughness” of the standard and σ denotes the degree of “vagueness”. With this parameterization, the expected litigation costs are

1. The values of m and σ are restricted to ensure that the interval lies within $[0,1]$.

$$E[\text{Litigation}; a] = \begin{cases} (1 - \beta)(1 - a) \min\{W, I\} & \text{if } a < m - \sigma\sqrt{3}, \\ (1 - \beta)(1 - a) \frac{m + \sigma\sqrt{3} - a}{2\sigma\sqrt{3}} \min\{W, I\} & \text{if } a \in m \pm \sigma\sqrt{3}, \\ 0 & \text{if } a > m + \sigma\sqrt{3} \end{cases} \quad (7).$$

The litigation costs (7) yield three possible effort choices:

$$\text{Fail to comply: } a_s = \frac{(1 - \beta) \min\{W, I\}}{c},$$

$$\text{Possibly comply: } a_v = \frac{(1 - \beta) \min\{W, I\} (1 + m + \sigma\sqrt{3})}{2[(1 - \beta) \min\{W, I\} + c \sigma\sqrt{3}]}, \quad (8).$$

$$\text{Certainly comply: } a_f = m + \sigma\sqrt{3}$$

YS's Lemma 2 shows that vagueness decreases the possible-compliance effort a_v and increases the certain-compliance effort a_f . While not emphasized by YS, I believe that emphasizing the auditor's cost trade-offs helps to clarify the effect of vagueness on effort. For reasons that will become clear in the next section, I illustrate with cost functions for high- and low-cost auditors.

Figure 1, panel A plots the auditor's total costs when standards are relatively weak, in the sense that m is low. If the standard is fairly precise, it takes little effort to completely eliminate the potential of legal liability. At these low effort levels, concerns over liability dominate concerns over effort costs and an increase in vagueness leads to higher effort from types of both auditor.

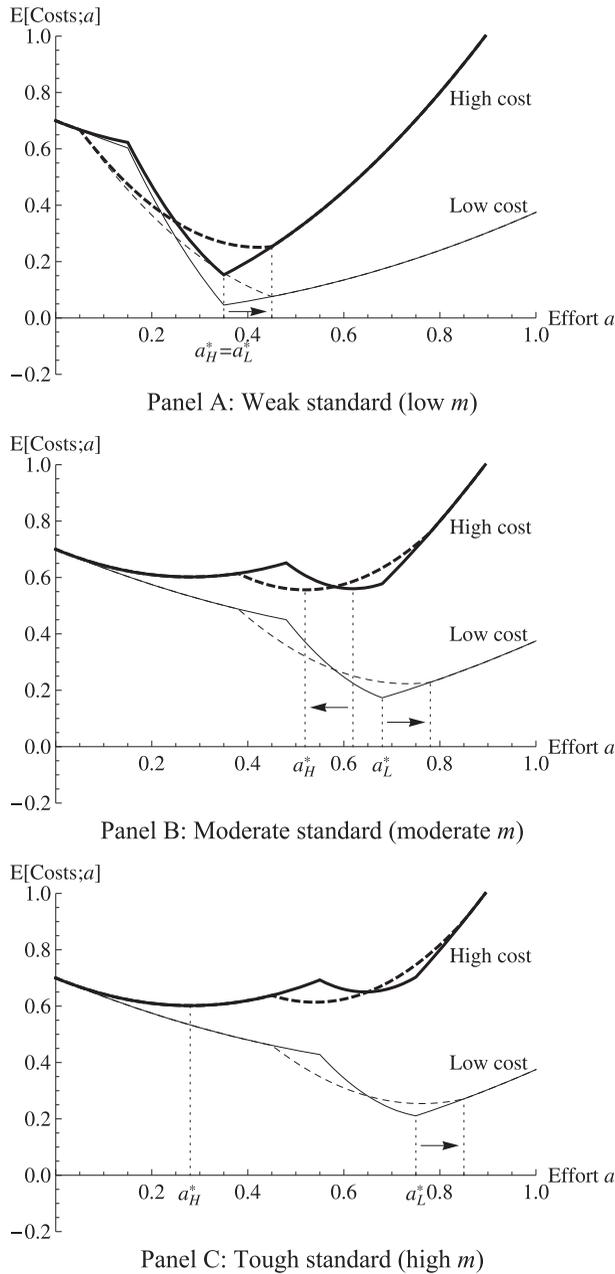
Figure 1, panel B plots the total costs with a moderate standard (moderate m). With a fairly precise standard, only an auditor with low costs finds it worthwhile to eliminate legal liability. An auditor with high costs chooses the "possibly comply" effort because it is not worthwhile to exert the effort required to completely eliminate legal liability. If the vagueness increases, the low-cost auditor continues certain compliance and increases effort. A high-cost auditor faces a meaningful trade-off between the costs of effort and litigation — he is willing to risk some likelihood of litigation in order to economize on effort costs. The high-cost auditor chooses the effort level a_v that balances the marginal cost of effort against the marginal benefit of reducing litigation. An increase in vagueness reduces the marginal impact of effort on expected litigation costs. Because the auditor faces convex effort costs, he reacts by reducing effort.

Finally, Figure 1, panel C plots total audit costs with a tough standard (high m). In this case, only high effort levels stand a chance of avoiding litigation in the event of an audit failure. As before, an auditor with low effort costs finds that the benefit of avoiding litigation outweighs the cost of effort. The low-cost auditor reacts to an increase in vagueness by increasing effort in order to continue ensuring against adverse litigation. Even with a precise standard, a high-cost auditor finds it too costly to comply with the standard. In the event of an audit failure, the high-cost auditor stands no chance of prevailing in litigation due to his low effort. An increase in vagueness does not change this — vague or not, the high-cost auditor finds that the cost of effort that would avoid litigation does not outweigh the cost of the audit itself.

3. Extending the model with heterogeneous auditors

In YS's analysis, the auditor and investors agree upon the auditing standard. As I showed in the previous section, this stems from the fact that the standard only affects the size of the surplus created by the audit, but not the division of the surplus. In a competitive audit market, it is possible to generate an example where investors and auditors disagree on the standard. In some cases, an auditor may prefer standards that push his effort *away* from the first-best effort level.

Figure 1 Auditor’s effort choice



Notes:

Figure 1 illustrates how the auditor’s effort reacts to an increase in the vagueness of auditing standards. The solid lines denote the auditor’s total costs of effort plus litigation with low vagueness. The shifted dashed lines denote the total costs with high vagueness. The thick (thin) lines represent a high- (low-) cost auditor.

Consider a market with two auditor types, H and L , where type H auditors have high costs $c_H > c_L$. The best that the high-cost auditor can offer investors is a fee that corresponds to zero auditor bargaining power. From expression (5) with $\lambda = 0$ and denoting

the fee by F_H , this is

$$F_H = \frac{c}{2}a_H^2 + E[\text{Litigation costs}; a_H] \quad (9).$$

where a_H denotes the high-cost auditor's equilibrium effort and the fee gives the entire surplus π_H from the audit to investors:

$$\pi_H = (1 - \beta)a_H I - \frac{c_H}{2}a_H^2 \quad (10).$$

A low-cost auditor can match the value offered by the high-cost auditor by charging a fee F_L :

$$\pi_H = \pi_L \Rightarrow F_L = (1 - \beta)(a_L - a_H)I + E[\text{Litigation}; a_L] + \frac{c_H}{2}a_H^2 \quad (11).$$

This yields the following surplus for the low-cost auditor:

$$\underbrace{(1 - \beta)(a_L - a_H)I}_{\text{Better detection}} + \underbrace{\frac{c_H}{2}a_H^2 - \frac{c_L}{2}a_L^2}_{\text{Cost advantage}} = \underbrace{(1 - \beta)a_L I - \frac{c_L}{2}a_L^2}_{\text{Surplus created by low-cost auditor}} - \underbrace{\left((1 - \beta)a_H I - \frac{c_H}{2}a_H^2 \right)}_{\text{Surplus created by high-cost auditor}} \quad (12).$$

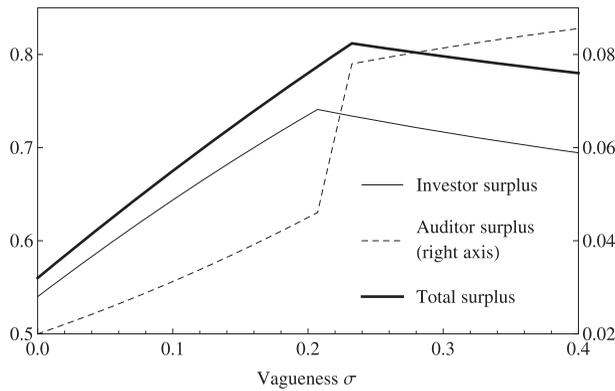
Because investors are held to the surplus given by (10), their preference for standards depends on setting the high-cost auditor's effort close to first-best. From expression (12), it becomes apparent that the low-cost auditor's preference for standards depends on two factors. *Ceteris paribus*, the low-cost auditor prefers standards that push his effort closer to first-best; however, he also benefits from pushing the high-cost auditor's effort *away* from first-best. This creates a conflict between the investors' and auditor's preferences for standards. The conflict stems from the effect of standards on the division of the surplus created by the audit.

Figure 2 illustrates how heterogeneous costs introduce a conflict between investors and auditors. Panel A plots the ex ante surplus from the audit as a function of the standards' vagueness σ . The parameters in the example are such that both the low- and high-cost auditors' effort levels fall short of first-best. This implies that higher effort increases the total surplus.

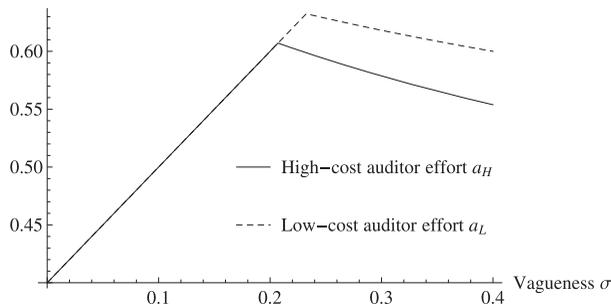
As shown in panel B, vagueness increases both auditor types' efforts for low levels of vagueness. As a result, starting from a fairly precise auditing standard, both investors, whose surplus is dictated by the high-cost auditor's effort, and low-cost auditors prefer a higher degree of vagueness. In other words, both investors and auditors would agree on revised standards that increase vagueness and this would be welfare-increasing.

As vagueness increases, the high-cost auditor's effort eventually declines because the auditor no longer finds it cost-effective to fully insulate himself against litigation in the event of an audit failure. This decline in the high-cost auditors' effort reduces the value of investors' outside option when they bargain with the low-cost auditor. In and of itself, this benefits the low-cost auditor. Not only that, but panel B shows that the low-cost auditor's effort continues to increase in vagueness after the high-cost auditor's effort begins to decline. The low-cost auditor can appropriate the higher surplus that results from his ability to commit to higher effort. These two effects lead to the steep increase in the auditor's surplus shown in the middle of panel A. In this case, the auditor would lobby for greater vagueness while the investors would not. The higher vagueness would be associated with an increase in overall welfare because it moves the auditor's effort closer to first-best.

Figure 2 Surplus and effort with heterogeneous costs



Panel A: Surplus as a function of vagueness σ



Panel B: Surplus as a function of vagueness σ

Notes:

Figure 2, panel A plots the surplus as a function of the audit standards’ vagueness σ for the firm, the low-cost auditor, and in total. Panel B plots the effort levels of the high-cost and low-cost auditors as a function of the audit standards’ vagueness σ .

As vagueness increases, the low-cost auditor eventually reduces effort after also finding it too costly to fully ensure against litigation, as shown in Figure 2, panel B. While this reduces the surplus created by the low-cost auditor, it reduces the investor’s surplus by even more. This is because vagueness has a greater impact on the high-cost auditor. As a result, the auditor would prefer greater vagueness in the standards, while the investors would not. In this case, the investors’ preference for less vagueness would be associated with the welfare-increasing choice. The low-cost auditor’s preference for greater vagueness merely reflects the desire for a larger slice of a shrinking pie.

4. Conclusion

Ye and Simunic (2013) provide insights into how two characteristics of auditing standards — toughness and vagueness — interact to determine auditor effort and preferences for the setting of auditing standards. The key trade-off in their model pertains to the cost of exerting effort and the cost of failing to detect a bad project. Auditing standards impact the latter cost, and, thus, the auditor’s effort choice that balances the two costs.

Vague standards, whose application in court are unknown ex ante, can lead to either higher or lower effort. This depends on whether or not the auditor’s baseline effort was

sufficient to meet the highest threshold that might be expected by the courts. For such auditors, the costs of legal liability outweigh the costs of audit effort and vagueness leads to greater effort. Vagueness reduces the effort of auditors whose effort costs are high enough for the auditor to risk legal liability in the event of an audit failure.

In Ye and Simunic 2013, investors and auditors agree on the structure of audit standards. Their model can be enriched to a setting with heterogeneous auditors where this no longer holds. In such markets, standards affect auditors directly, via the effort levels to which they can commit, and indirectly via the effort of other auditors, which determines investors' bargaining power. In such settings, the preferences for standards reflect not only the maximization of the surplus created by the audit, but also the division of that surplus. I showed an example in which this can cause an auditor with relatively low costs to lobby for vague standards, even if this reduces overall welfare.

References

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