Conservative Accounting, Audit Quality, and Litigation

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Research Areas: Corporate Governance；
Executive Compensation；
Management Control Systems；
Organizational Design

Publications

Debt Covenants and Accounting Manipulation. By: Volker Laux. The Accounting Review, January 2022, Vol. 97 No. 1, 293 - 314.

Signaling Private Information via Accounting System Design. By: Aysa Dordzhieva, Volker Laux, Ronghuo Zheng. Journal of Accounting and Economics. August 2022, Vol. 74, Issue 1, 101494.

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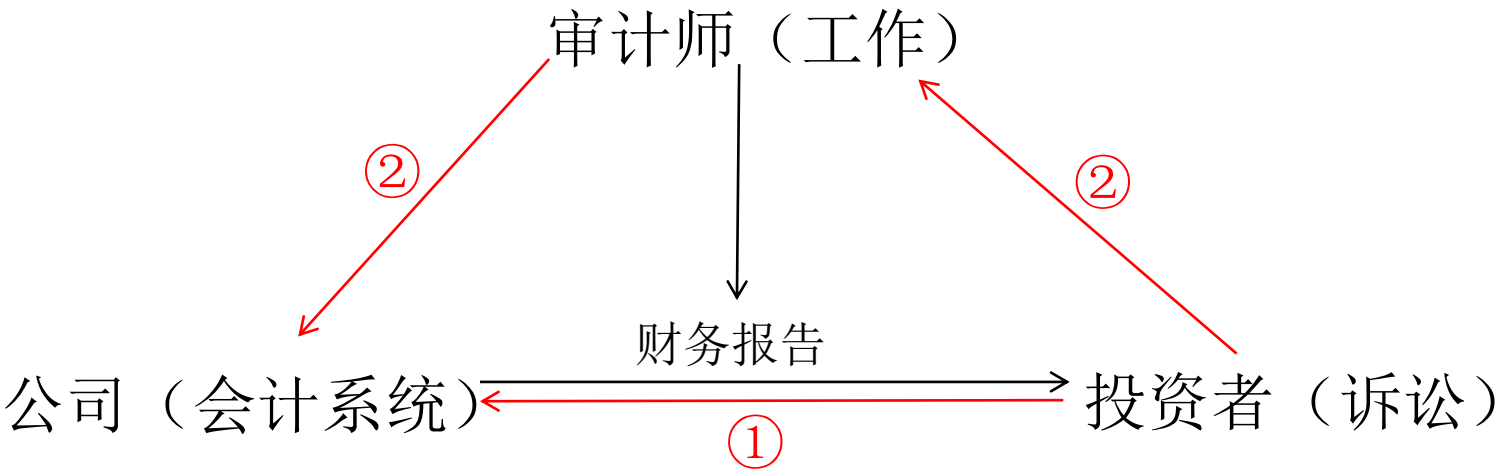


① 直接诉讼效应

② 间接诉讼效应（审计努力效应）

摘要

相对于低估报告，高估报告时投资者更有可能起诉公司及其审计师，这种诉讼暴露的不对称性被视为企业保守会计做法的一个重要驱动因素，因为保守性减少了夸大陈述的可能性，从而减少了投资者诉讼。然而，这一论点是不完整的，因为它忽略了诉讼问题也会影响审计师的激励机制，而这反过来又会影响公司的最佳报告系统。

诉讼的威胁鼓励公司只有在发现误报的审计成本相对较高时才作出更保守的报告，而当审计师的审计成本较低时，则促进不那么保守的报告。

Section 2. model

Section3. auditor’s optimal audit effort and the equilibrium audit fee.

Section4. optimal accounting system

Section5. a comparative statics analysis.

Section6. the empirical predictions of our model

Conclusion

Model

- an owner-manager of a firm, prospective investors, an auditor.
- economic state $\theta \in \{\theta_l, \theta_h\}$, $P(\theta = \theta_h) = q$, $P(\theta = \theta_l) = 1-q$

时间线

1 – the manager or the firm designs the accounting system

2 – an imperfect accounting report, $R \in \{R_h, R_l\}$
the manager can hire an auditor, pays an audit fee W
auditor chooses audit effort a, issue a qualified or unqualified opinion

3 – the manager sells the firm to investors
investors make an additional investment of $I > 0$

4 – payoffs are realized,(若$\theta = \theta_h$，则$X > I$，投资成功；
若$\theta = \theta_l$, 则$X=0$，投资失败)

Accounting System (maps θ into R）

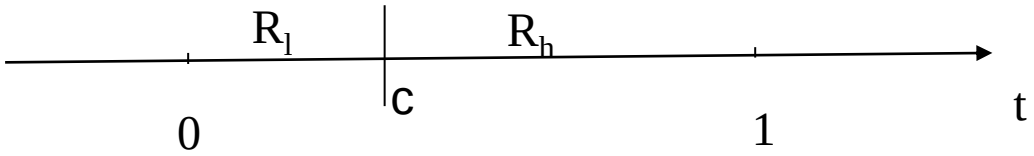
accounting evidence t ∈ [0, 1] is generated from a distribution with density $f_\theta(t)$. We assume t ∈ (0, 1)， $f_\theta(t) > 0$， $f_{\theta h}(t)/f_{\theta l}(t)$ is strictly increasing in t.

$$f(t) = q f_{\theta_h}(t) + (1-q) f_{\theta_l}(t).$$

assume $$\lim_{t\to 0}\frac{f_{\theta_h}(t)}{f_{\theta_l}(t)} \to 0 \text{ and } \lim_{t\to 1}\frac{f_{\theta_h}(t)}{f_{\theta_l}(t)} \to \infty, \qquad (1)$$

$$\lim_{t\to 0}\Pr(\theta_h|t)\to 0 \text{ and } \lim_{t\to 1}\Pr(\theta_h|t)\to 1$$

acpcounting evidence t into a report R $\in \{R_h, R_l\}$



$$\Pr(R_h) = \int_c^1 f(t)dt \text{ and } \Pr(R_l) = \int_0^c f(t)dt$$

C可观测，C越大，保守程度越高

$$\Pr(\theta_h|R_h) = q\frac{\int_c^1 f_{\theta_h}(t)dt}{\Pr(R_h)}$$

$$\frac{d\Pr(R_h)}{dc} < 0 \text{ and } \frac{d\Pr(R_l)}{dc} > 0,$$

$$\Pr(\theta_h|R_l) = q\frac{\int_0^c f_{\theta_h}(t)dt}{\Pr(R_l)}$$

$$\frac{d\Pr(\theta_h|R_h)}{dc} > 0 \text{ and } \frac{d\Pr(\theta_l|R_l)}{dc} < 0.$$

$$P(\theta_h \mid R_h) = \frac{P(\theta_h)\,P(R_h \mid \theta_h)}{P(R_h)}$$

Auditor

Audit effort a ∈ [0, 1]，发现错报的概率为a，发表合格意见（D），没有发现错报的概率为1-a, 发表不合格的意见（A）

Audit effort a is unobservable and associated with a cost of $ka^2/2$ for the auditor。

Litigation（诉讼）

诉讼的条件：R_h, A, θ_l

$L_A \equiv s(\delta_A + \rho_A)$，$L_M \equiv s(\delta_M + \rho_M)$，$s \in (0, 1]$诉讼成功的可能性，也代表了法律环境的严格程度。

$\delta_T \equiv \delta_A + \delta_M$总损害赔偿金，$\rho_T \equiv \rho_A + \rho_M$总名誉损失

$\phi\,\delta_T$支付给委托人（律师）的费用 $\phi \in [0, 1]$

$(1-\phi)\delta_T$投资者得到的赔偿金　　$\delta_T < I$，$\phi > 0$，$\Psi > 0$

$\Psi \equiv s(\phi\,\delta_T + \rho_T)$投资者得不到的损失

3 Auditor Effort and Fee

Conditional on the accounting evidence t, the auditor chooses effort a that maximizes

$$-0.5ka^2 - \Pr(\theta_l|t)(1-a)L_A. \quad (3)$$

审计成本+诉讼成本

$$\Pr(\theta_l|t) = (1-q)f_{\theta_l}(t)/f(t), \quad (4)$$

$$a_t = \Pr(\theta_l|t)L_A/k. \quad (5)$$

Lemma 1.

The auditor chooses higher effort a_t when

i. the accounting evidence t is lower,
ii. the legal environment is stricter (s is higher),
iii. the cost of auditing k is lower.

audit fee W

The manager pays the auditor a fee W that is just high enough to compensate him or her for the expected litigation and effort costs.

$$W = \frac{(1-q)\int_c^1 (1-a_t) f_{\theta_l}(t)dt}{\int_c^1 f(t)dt} L_A + \frac{\int_c^1 0.5ka_t^2 f(t)dt}{\int_c^1 f(t)dt}. \quad (6)$$

$$\mathrm{P}(\mathrm{A},\theta_l \mid R_\mathrm{h}) = \frac{\mathrm{P}(\theta_l)P(A,R_\mathrm{h} \mid \theta_l)}{P(R_\mathrm{h})}$$

Lemma 2. The audit fee W increases when
i. the accounting system is less conservative (c is lower),
ii. the legal environment is stricter (s is higher), and
iii. the cost of auditing k is higher.

$$\eta_t \equiv \Pr(\theta_l|t)(1-a_t)L_A + 0.5ka_t^2$$

$$\Pr(\theta_l|t) = (1-q)f_{\theta_l}(t)/f(t), \tag{4}$$

$$W = \frac{\int_c^1 \eta_t f(t)dt}{\int_c^1 f(t)dt}. \tag{27}$$

$$\frac{dW}{dc} = \frac{-\eta_c f(c)}{\int_c^1 f(t)dt} + f(c)\frac{\int_c^1 \eta_t f(t)dt}{\left(\int_c^1 f(t)dt\right)^2} \tag{28}$$

$$= -\frac{\int_c^1 \eta_c f(t)dt - \int_c^1 \eta_t f(t)dt}{\left(\int_c^1 f(t)dt\right)^2} f(c).$$

$$\int_c^1 \eta_c f(t)dt > \int_c^1 \eta_t f(t)dt,$$

$$\frac{dW}{dc} < 0.$$

$$\Pr(\theta_l|t)L_A - ka_t = 0. \tag{29}$$

$$\frac{d\eta_t}{dt} = \frac{d\Pr(\theta_l|t)}{dt}(1-a_t)L_A - (\Pr(\theta_l|t)L_A - ka_t)\frac{da_t}{dt} < 0,$$

$$\frac{dW}{ds} = \frac{-\int_c^1 (\Pr(\theta_l|t)L_A - ka_t)\frac{da_t}{ds}f(t)dt}{\int_c^1 f(t)dt} + \frac{\int_c^1 \Pr(\theta_l|t)(1-a_t)\frac{dL_A}{ds}f(t)dt}{\int_c^1 f(t)dt}. \quad (30)$$

Because $\frac{dL_A}{ds} > 0$, we obtain $\frac{dW}{ds} > 0$.

$$\frac{dW}{dk} = \frac{-\int_c^1 (\Pr(\theta_l|t)L_A - ka_t)\frac{da_t}{dk}f(t)dt}{\int_c^1 f(t)dt} + \frac{\int_c^1 0.5a_t^2 f(t)dt}{\int_c^1 f(t)dt} > 0, \quad (31)$$

4 Optimal Accounting System

投资者愿意付出的价格V(c)

预期投资收益-投资支出+预期能收到的赔偿金

$$V(c) = \Pr(\theta_h|R_h, A)X - I + \Pr(\theta_l|R_h, A)s(1-\phi)\delta_T, \quad (7)$$

$$\frac{\mathrm{P}(\theta_\mathrm{h})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{h})}{\mathrm{P}(\theta_\mathrm{h})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{h}) + \mathrm{P}(\theta_\mathrm{l})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{l})}$$

$$\Pr(\theta_h|R_h, A) = \frac{q\int_c^1 f_{\theta_h}(t)dt}{\int_c^1 \left(qf_{\theta_h}(t) + (1-q)f_{\theta_l}(t)(1-a_t)\right)dt}, \quad (8)$$

a_t越大，$\Pr(\theta_\mathrm{h}|R_\mathrm{h}, A)$ 越大，V(c)越大

4 Optimal Accounting System

manager chooses the level of conservatism c that maximizes his or her ex ante utility

预期市场价格-预期诉讼成本-预期审计费用

$$U(c) = \Pr(R_h, A)V(c) - (1-q)L_M \int_c^1 (1-a_t) f_{\theta_l}(t)dt - \Pr(R_h)W(c), \quad (9)$$

$\mathrm{P}(\theta_\mathrm{l}, R_l, A)\ L_\mathrm{M} =$
$\mathrm{P}(\theta_\mathrm{l})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{l})\ L_\mathrm{M}$

$$\Pr(R_h, A) = \int_c^1 \left(q f_{\theta_h}(t) + (1-q) f_{\theta_l}(t)(1-a_t)\right)dt$$

$\mathrm{P}(\theta_\mathrm{h})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{h}) + \mathrm{P}(\theta_\mathrm{l})\mathrm{P}(R_\mathrm{h}, A \mid \theta_\mathrm{l})$

no litigation and no auditor

$$U(c) = \Pr(R_h)V(c)$$
$$= q(X-I) - q(X-I)\int_0^c f_{\theta_h}(t)dt - (1-q)I\int_c^1 f_{\theta_l}(t)dt. \qquad (10)$$

第一项：理想世界中状态θ可观测时的预期收益
第二项：第二类错误（放弃一个成功的投资的预期成本）
第三项：第一类错误（投资于一个失败的项目的预期成本）

（10）式对c求导：

$$-q f_{\theta_h}(c)(X-I) + (1-q)f_{\theta_l}(c)I = 0. \qquad (11)$$

存在唯一的c

return to the original setting with auditing and litigation

$$U(c) = \Pr(R_h, A)V(c) - (1-q)L_M \int_c^1 (1-a_t) f_{\theta_l}(t)dt - \Pr(R_h)W(c), \tag{9}$$

$$U(c) = q(X-I) - q(X-I)\int_0^c f_{\theta_h}(t)dt - (1-q)(I+\Psi)\int_c^1 (1-a_t) f_{\theta_l}(t)dt - \int_c^1 0.5ka_t^2 f(t)dt. \tag{12}$$

$$\frac{dU(c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c). \tag{13}$$

$$\frac{dU(c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c)$$

$$U(c) = q(X-I) - q(X-I)\int_0^c f_{\theta_h}(t)dt$$

$$-(1-q)(I+\Psi)\int_c^1 (1-a_t)f_{\theta_l}(t)dt - \int_c^1 0.5ka_t^2 f(t)dt.$$

- an increase in the degree of conservatism c：
  1. imposes an opportunity cost of f_{θ_l} of (X − I) on the manager
  2. reduces the risk of overinvestment and litigation by $(1-\mathrm{q})f_{\theta_l}(\mathrm{c})(1-a_c)$
  3. reduces the probability that the manager hires the auditor and has to compensate the auditor for his or her effort.
- litigation increases the manager's cost of an overstatement by Ψ

5 法律环境的影响

- the ex ante probability of investor litigation:

$$\Omega(c,k) \equiv (1-q)\int_c^1 (1-a_t) f_{\theta_l}(t)dt, \qquad (14)$$

which declines in c:

$$\frac{d\Omega(c,k)}{dc} = -(1-q)(1-a_c) f_{\theta_l}(c) < 0. \qquad (15)$$

保守程度c越大诉讼风险Ω越小，并不意味着法律环境越严格（s越大）保守程度越高（c越大）

- 最优保守程度c*对s求偏导，探讨其与s的关系：

$$\frac{dU(c)}{dc} = 0 = -q(X-I) f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c) f_{\theta_l}(c) + 0.5ka_c^2 f(c). \qquad (13)$$

(其中Ψ和 a_c 是s的函数)

$$\frac{d^2U(c,a_c)}{dcds} = \underbrace{-\frac{d\Omega(c,k)}{dc}\frac{d\Psi}{ds}}_{\text{direct litigation effect}} + \underbrace{\frac{\partial^2 U(c,a_c)}{\partial c \partial a_c}\frac{da_c}{ds}}_{\text{audit effort effect}}. \qquad (16)$$

<0 >0 ? >0

discuss the audit effort effect：

$$\frac{dU(c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c). \quad (13)$$

将（13）重新写（含a_c部分合并）：

$$\frac{dU(c,a_c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)f_{\theta_l}(c) - M(c,a_c), \quad (17)$$

where $M(c,a_c) = (1-q)(I+\Psi)a_c f_{\theta_l}(c) - 0.5ka_c^2 f(c)$ (18)

$$\frac{dM(c,a_c)}{da_c} = (1-q)f_{\theta_l}(c)(I+\Psi) - ka_c f(c). \quad (19)$$

$$= (1-q)(I+\Psi-L_A)f_{\theta_l}(c) > 0. \quad (20)$$

$$\frac{\partial^2 U(c,a_c)}{\partial c \partial a_c} = -\frac{dM(c,a_c)}{da_c} < 0$$

其中，$I+\Psi = I + s(\phi\sigma_T + \rho_T)$，$L_A = s(\sigma_A + \rho_A)$

$$\frac{d^2U(c,a_c)}{dcds} = \underbrace{-\frac{d\Omega(c,k)}{dc}\frac{d\Psi}{ds}}_{\text{direct litigation effect}} + \underbrace{\frac{\partial^2 U(c,a_c)}{\partial c \partial a_c}\frac{da_c}{ds}}_{\text{audit effort effect}}. \quad (16)$$

- the direct litigation effect implies that a stricter legal regime promotes more conservative accounting
- the audit effort effect implies that an increase in s promotes less conservative accounting

which effect dominates?

Proposition 1. *There is a unique threshold* $\widehat{k}$*, such that a stricter legal environment (higher s) encourages less conservative accounting,* $\frac{dc^*}{ds} < 0$*, if the cost of auditing is relatively low* $(k < \widehat{k})$*, and encourages more conservative accounting,* $\frac{dc^*}{ds} > 0$*, if the cost of auditing is relatively high* $(k > \widehat{k})$.

$$\frac{d^2U(c,a_c)}{dcds} = \underbrace{-\frac{d\Omega(c,k)}{dc}\frac{d\Psi}{ds}}_{\text{direct litigation effect}} + \underbrace{\frac{\partial^2 U(c,a_c)}{\partial c \partial a_c}\frac{da_c}{ds}}_{\text{audit effort effect}}. \quad (16)$$

(<0, >0, <0, >0)

$k < \widehat{k}$：审计努力效应主导

$k > \widehat{k}$：直接诉讼效应主导

k越小
- a_c越大(Lemma1) ⟶ $\left|\frac{d\Omega(c,k)}{dc}\right|$ 越小 ⟶ 直接诉讼效应小
- $\frac{da_c}{ds}$越大 ⟶ 审计努力效应大

$$\frac{d\Omega(c,k)}{dc} = -(1-q)(1-a_c)f_{\theta_l}(c) < 0.$$

$$a_t = \Pr(\theta_l|t)L_A/k.\ \ L_A \equiv s(\delta_A + \rho_A)$$

Proposition 2. *The manager chooses a higher degree of conservative accounting c when*

(i) the fraction of damages ϕ *lost to attorneys increases,*

(ii) the manager's reputation loss ρ_M *increases, or*

(iii) the cost of auditing k *increases.*

$$\frac{dU(c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c).$$

$$= -q(X-I)f_{\theta_h}(c) + (1-q)[I+s(\phi\sigma_T + \rho_M + \rho_A)](1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c)$$

1. 赔偿金中给律师的比率越大，高估所带来的不可收回成本越大，保守程度越高
2. 公司的名誉损失越大，诉讼所带来的不可收回成本越大，保守程度越高

Proposition 2. *The manager chooses a higher degree of conservative accounting c when*

(i) the fraction of damages ϕ lost to attorneys increases,

(ii) the manager's reputation loss ρ_M increases, or

(iii) the cost of auditing k increases.

$$\frac{dU(c)}{dc} = 0 = -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)(1-a_c)f_{\theta_l}(c) + 0.5ka_c^2 f(c).$$

$$= -q(X-I)f_{\theta_h}(c) + (1-q)(I+\Psi)f_{\theta_l}(c) - M(c,a_c),$$

$$M(c,a_c) = (1-q)(I+\Psi)a_c f_{\theta_l}(c) - 0.5ka_c^2 f(c)$$

$$\frac{dM(a_c(k),k)}{dk} = (1-q)(I+\Psi-L_A)f_{\theta_l}(c)\frac{da_c}{dk} - 0.5a_c^2 f(c) < 0.$$

3. 第一项：k越大，审计努力a_c越小，降低了审计师的价值

   第二项：k越大，审计成本越高，降低了审计师的价值

6 Empirical Implications

- a measure of conservative reporting： $\Pr(R_l) = \int_0^c f(t)dt$

  a measure of audit quality： $\Pr(R_h, D) \equiv (1-q)\int_c^1 a_t f_{\theta_l}(t)dt.$

  $P(R_h,D) = P(R_h,D,\theta_l) = P(\theta_l)P(R_h, A \mid \theta_l)$

- how heightened litigation s affects $\Pr(R_l)$ and $\Pr(R_h, D)$?

Proposition 3. *A stricter legal environment (higher s) leads to less frequent low reports and more frequent qualified audit opinions ($d\Pr(R_l)/ds < 0$ and $d\Pr(R_h, D)/ds > 0$) if the cost of auditing is relatively low ($k < \hat{k}$) but leads to more frequent low reports and either more or less frequent qualified opinions if the cost of auditing is relatively high ($k > \hat{k}$).*

$$\Pr(R_l) = \int_0^c f(t)dt \qquad \Pr(R_h, D) \equiv (1-q)\int_c^1 a_t f_{\theta_l}(t)dt.$$

k < $\hat{k}$：s增加 ⟶ c减小 ⟶ $Pr(R_l)$ 减小

s增加 ⟶ c减小且a_t增大 ⟶ $Pr(R_h, \mathrm{D})$增大

k > $\hat{k}$：s增加 ⟶ c增大 ⟶ $Pr(R_l)$ 增大

s增加 ⟶ c增大且a_t增大 ⟶ $Pr(R_h, \mathrm{D})$变化不确定

Proposition 4. *The frequency of low reports* $\Pr(R_l)$ *increases and the frequency of qualified opinions* $\Pr(R_h, D)$ *decreases when*

i. *a higher fraction of damages is lost to attorneys* (ϕ *increases*),

ii. *the manager's reputation concern* ρ_M *increases, or*

iii. *the cost of auditing* k *increases.*

$$\Pr(R_l) = \int_0^c f(t)dt \qquad \Pr(R_h, D) \equiv (1-q)\int_c^1 a_t f_{\theta_l}(t)dt.$$

ϕ、ρ_M增加 ⟶ c 增加(定理2) ⟶ $Pr(R_l)$ 增加, $Pr(R_h, \mathrm{D})$减小

k增加 ⟶ c 增加(定理2) ⟶ $Pr(R_l)$ 增加

k增加 ⟶ c 增加(定理2)且a_c减小 ⟶ $Pr(R_h, \mathrm{D})$减小

Conclusion

- We find that the threat of litigation affects the firm's optimal accounting system directly as well as indirectly via its impact on the auditor's behavior.
  诉讼威胁直接影响公司的最优会计制度，也通过对审计人员行为的影响，间接影响公司的最优会计制度。
- The indirect effect arises because heightened litigation exposure induces the auditor to work harder to prevent overstatements, which reduces the benefits of conservative reporting.
  间接影响产生的原因是，诉讼风险的增加促使审计师更努力地防止夸大陈述，从而减少了保守报告的好处。
- The model predicts that higher litigation exposure leads to more conservative accounting practices only when the cost of auditing is relatively high but leads to less conservative accounting when the cost of auditing is relatively low.
  模型预测，只有当审计成本较高时，更高的诉讼风险才会导致更保守的会计做法，当审计成本更低时，则导致不那么保守的会计制度。

谢谢大家