Andreas Krause

Chapter 15.3

Misrepresentation of trading outcomes

Outline

- Problem and model assumptions
- Incentives for traders
- Incentives for managers
- Equilibrium outcome
- Summary

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Hiding losses and reporting profits

- Traders may hide losses from trading or exaggerate profits
- Apart from fraud, this might be achieved by underreporting risks, delaying the realisation of losses, or recognising unrealised profits
- The aim for traders is to increase their remuneration

Reporting the value of trading positions

- The position of a trader is worth V_H with probability π, or $V_L < V_H$ otherwise
- Traders are remunerated with a fraction w_T of this value
- A trader can report any value, regardless of the actual outcome, misrepresentations happens with probability p
- Monitoring of traders by managers or audits will reveal any misrepresentations

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Outcomes for traders

- Assume the low value V_L is realised
- If reporting the value truthfully, traders receive $\Pi_T = w_T V_L$
- If they do not report truthfully, they might receive $w_T V_H$
- Their misrepresentation will be caught if the manager monitors (probability λ_M) or an audit takes place (probability λ_A)
- If misrepresentation is detected, they are fined F_T and receive no remuneration
- This fine can represent the cost of dismissal or reduction in future bonuses

Trader profits with misrepresentation

- If the trader is monitored by his manager, he is fined F_T
- If the trader is not monitored, he will be fined F_T if an audit takes place
- If no auditing takes place, the trader is not detected and receives $w_T V_H$
- Trader profits: $\hat{\Pi}_T = -\lambda_M F_T + (1 - \lambda_M)(-\lambda_A F_T + (1 - \lambda_A) w_T V_H)$

Truthful reporting

- If $\Pi_T \geq \hat{\Pi}_T$, the outcome is reported truthfully
- This requires $\lambda_M \geq \lambda_M^* = \frac{w_T((1-\lambda_A)V_H - V_L) - \lambda_A F_T}{(1-\lambda_A)(F_T + w_T V_H)}$
- If managers are sufficiently likely to monitor, traders will report truthfully

Outcome for managers with monitoring

- Managers receive a fraction w_M of what a trader declares
- Monitoring traders costs C
- Traders misrepresent a low value V_L as V_H with probability p
- If the high outcome is realised, the manager gets $w_M V_H - C$
- If the low outcome is realised, he will receive $w_M V_L - C$
- $\Pi_M = \pi \left(w_M V_H - C \right) + (1 - \pi) \left(w_M V_L - C \right)$

Outcome for managers without monitoring

- If traders misrepresent the outcome and the manager does not monitor, he will be fined F_M if an audit detects this
- If the high outcome is realised, he receives $w_M V_H$
- if the low outcome is realised, and outcome is misrepresented, then is fined F_M if an audit takes place, without an audit receives $w_M V_H$
- If the outcome is not misrepresented, he receives $w_M V_L$
- $\hat{\Pi}_M = \pi w_M V_H + (1-\pi)\left(p\left(-\lambda_A F_M + (1-\lambda_A) w_M V_H\right) + (1-p) w_M V_L\right)$

Monitoring incentives

- Managers will monitor if $\Pi_M \geq \hat{\Pi}_M$
- This requires $p \geq p^* = \frac{C}{\lambda_A(1-\pi)(F_M+w_M V_H)}$
- If misrepresentation of outcomes is sufficiently common, managers will monitor

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Equilibrium monitoring and misrepresentation

- If $\lambda_M > \lambda_M^*$, traders report truthfully, hence $p = 0$
- Of $p = 0$, then $\Pi_M < \hat{\Pi}_M$ and monitoring does not occur, $\lambda_M = 0$
- If $\lambda_M = 0$, then $\hat{\Pi}_T > \Pi_T$ and all traders misrepresent outcomes, hence $p = 1$
- This again would induce managers to monitor
- Equilibrium requires $\lambda_M = \lambda_M^*$ and $p = p^*$

Equilibrium misrepresentation of outcomes

- We can combine these equilibrium conditions
- $p^* = \frac{\left(1-\lambda_M^*\right)(F_T+w_T V_H)C}{(1-\pi)(F_M+w_M V_H)\left(w_T(V_H-V_L)-\lambda_M^*(F_T+w_T V_H)\right)}$
- Misrepresentations happen in equilibrium, but is reducing in monitoring
- Auditing reduces misrepresentations directly, but also reduces monitoring efforts, hence they are imperfect substitutes

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Incentives to misrepresent outcomes

- Traders have an incentive to misrepresent outcomes and this cannot be eliminated, even if monitoring or auditing is detecting this behaviour well
- Any sanctions will only reduce the likelihood of misrepresentation as these are weighed against the benefits
- Increasing the auditing of managers will reduce their monitoring efforts as it affects the misrepresentations by traders

Complicit managers

- Misrepresentation of trading outcomes is inevitable
- The incentives of higher remuneration for managers after misrepresentation lead to limited monitoring, allowing misrepresentations to occur
- Managers are complicit in such behaviour as they benefit, too

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Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom

E-mail: `mnsak@bath.ac.uk`