

Risk-sharing or risk-taking? Counterparty risk, incentives, and margins

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The views expressed are solely those of the authors.

Research question

- Financial contracts enable risk-sharing (e.g., forwards, credit-default swaps)
- But they may also lead to more risk-taking
 - “Has financial development made the world riskier?” (Rajan, 2006)

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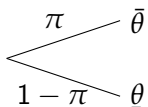
- Financial contracts enable risk-sharing (e.g., forwards, credit-default swaps)
- But they may also lead to more risk-taking
 - “Has financial development made the world riskier?” (Rajan, 2006)
- Is there a conflict between risk-sharing gains from trade and risk-taking incentives?
- Can hedging and margins lead to more aggregate risk?

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 - costly risk-control and protected by limited liability
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- Insufficient risk-sharing or counter-party risk?
- What does the optimal contract look like?
- What is the role of margins?
- Do markets implement information constrained optimum?

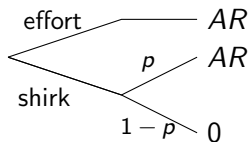
Protection buyer (principal)

- Risk averse (concave utility u)
- Endowed with a risky position $\tilde{\theta}$



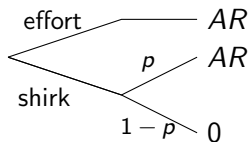
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- Endowed with risky assets-in-place $A\tilde{R}$ (independent of $\tilde{\theta}$)
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- Shirking carries private benefit AB
- Protected by limited liability \rightarrow moral hazard
- Risk-control effort efficient: $(1 - p)R > B$

Early liquidation and margins

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- Margin is inefficient: loss $\alpha A(R - 1)$
- Margin reduces cost of risk-control by αAB

Information structure

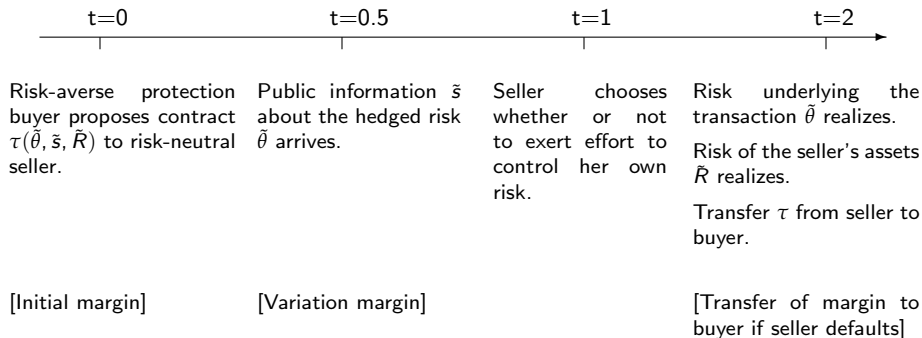
- Public information \tilde{s} about the hedged risk $\tilde{\theta}$ becomes available
- The signal is informative: $\text{prob}[\underline{\theta}|\underline{s}] > \text{prob}[\underline{\theta}]$

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 - the realization of the buyer's risky position $\tilde{\theta}$
 - the realization of the seller's risky balance-sheet \tilde{R}
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- Liquidation of fraction α of seller's assets contingent on signal \tilde{s} (and deposit the cash on the margin account)

Sequence of events



- Protection buyer request seller's effort and solves

$$\max_{\tau, \alpha} E[u(\tilde{\theta} + \tau)]$$

$$\text{subject to } AR \leq E[\alpha A + (1 - \alpha)AR - \tau] \quad [PC]$$

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- In the first-best
 - full insurance
 - contract does not depend on the signal \tilde{s}
 - margins are not used
 - contract is actuarially fair, $E[\tau] = 0$

Incentive constraint (depends on signal \tilde{s})

- Expected profit of protection seller under effort

$$AR - E[\tau|s]$$

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 - Alternative: complete hedge but seller may default
- Buyer's choice between signal and counterparty risk

Margins when seller effort implemented

- Incentive problem only after bad signal \rightarrow margin only called after \underline{s} (variation margin)
- Margin tightens participation constraint

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- Margin relaxes incentive constraint if $\mathcal{P} < 1$

$$E[\tau|\underline{s}] \leq \alpha A + (1 - \alpha)AP$$

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- Margins improve welfare...
- ...but may lead to more aggregate risk

- N protection sellers

Conclusion

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- Or risk-taking by protection buyer (seeking more protection and accepting counterparty risk)
- Variation margins improve welfare but may increase aggregate risk
- Unregulated trading leads to a market failure
- Imposing initial margins restores constrained efficiency