

Time Inconsistency in Stress Test Design

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Question: What is the optimal stress test design when stress tests are used to serve *both* purposes?

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Time inconsistency problem exists

- Before a stress test: CB wants to *appear* tough
- After a stress test: CB wants to *act* soft

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Why focus on HRF:

- HRF can be socially optimal
- In use (UK, previously EA)
- Theory contribution

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Results:

- Disclosure provides *more* information than may appear at first glance
 - ▶ choice of stress severity contains information
 - ▶ decision to not disclose would be a weak signal
- Disclosure can create informational contagion
- Reinterpretation of past stress tests

Verifiable Disclosure Game with Multiple Banks

There are two banks with $H_i \sim U[0, 1] \forall i = 1, 2$.

Players

- Central Bank (sender)
- Financial Markets (receiver)

Pay-offs

- Financial markets form $\mu_i = \mathbb{E}[H \mid \mathcal{I}]$
- CB's pay-off: $V(\mu_1, \mu_2) = \mu_1 + \mu_2$

Order of moves

- Nature draws bank health. CB observes it.
- CB sends a truthful message to financial markets.
- Financial markets update.

Hurdle Rate Framework

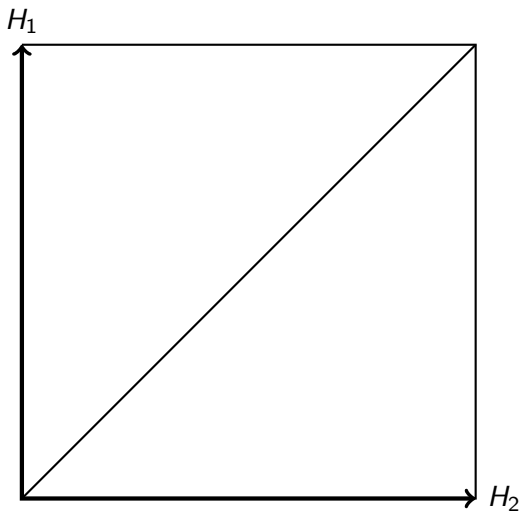
Messages must take the form $\{s, o_1, o_2\}$ where $s \in [0, 1]$, and $o_i = p$ iff $H_i \geq s$, otherwise $o_i = f$.

Example:

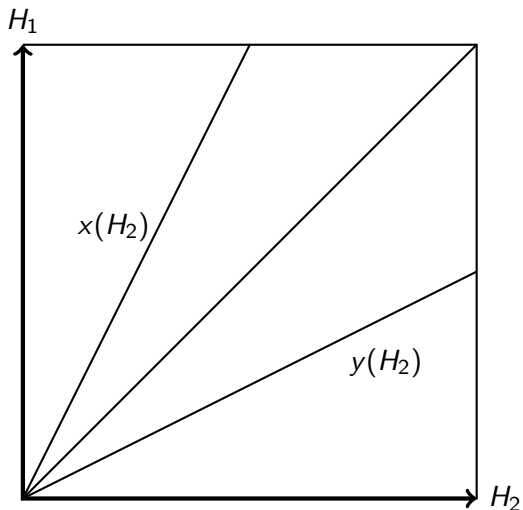
- $\{0.2, p, f\}$
- Markets learn that $H_1 \geq 0.2$, $H_2 < 0.2$ and that $s = 0.2$ was chosen strategically after observing H_1, H_2 .

Messages must be truthful, but $\{0, p, p\}$ is always feasible.

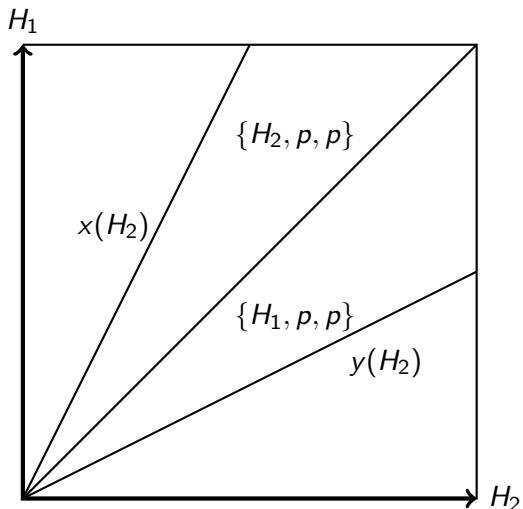
Equilibrium Communication Strategy



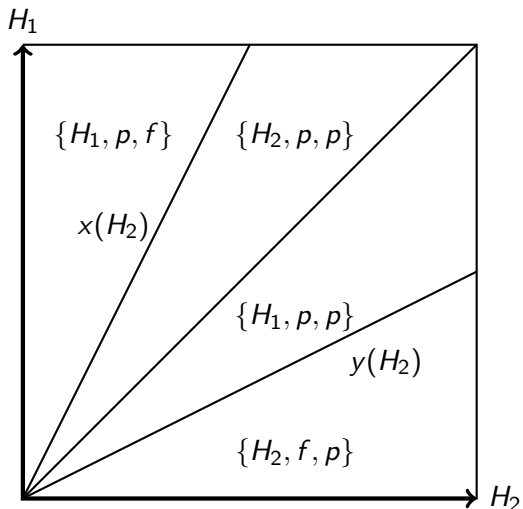
Equilibrium Communication Strategy



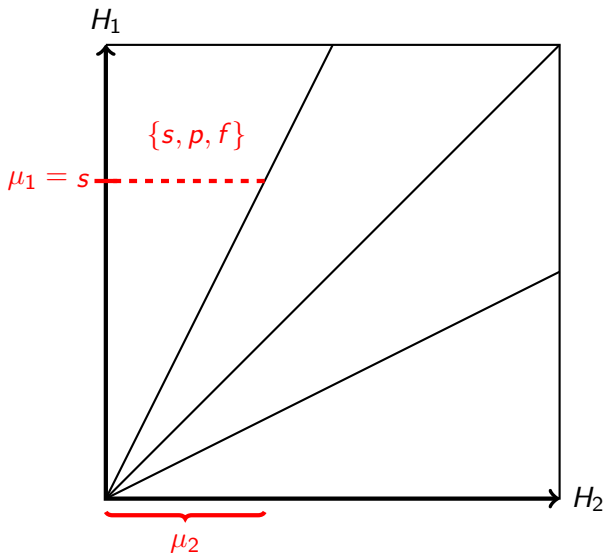
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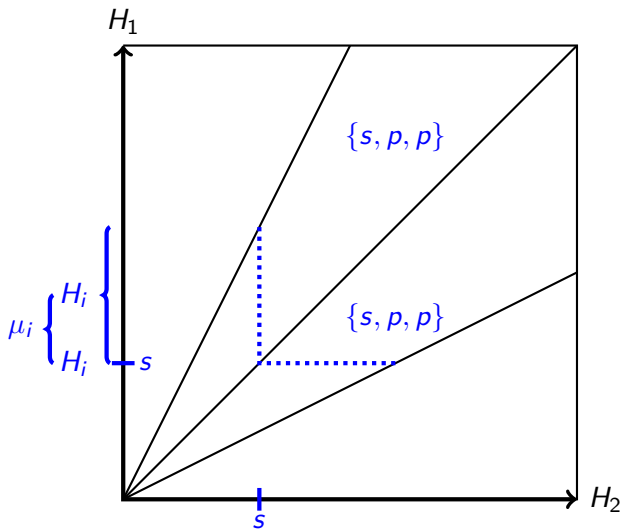


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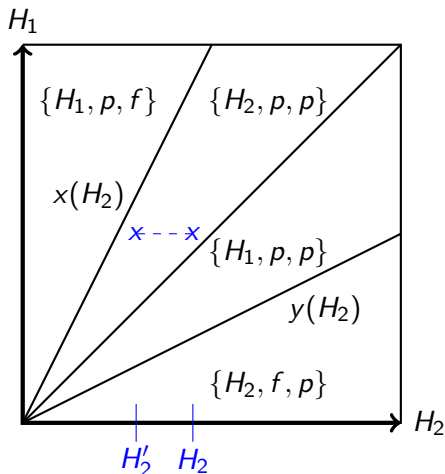
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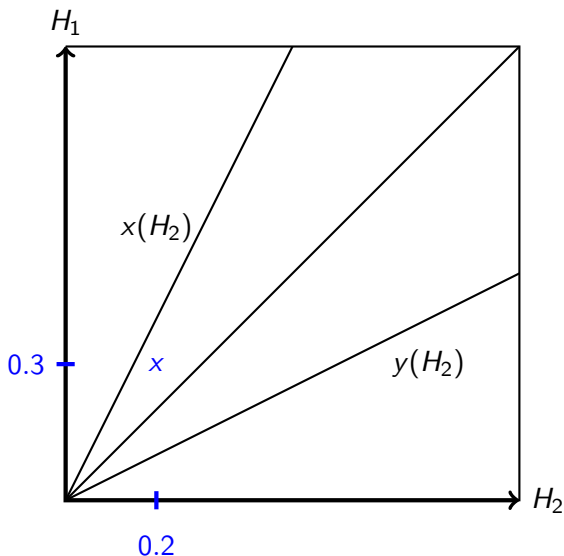
$\{s, p, p\}$ 

$$\mu_1 = \mu_2 = \frac{1}{2}s + \frac{1}{2}\mathbb{E}[H \mid s \leq H \leq x(s)]$$

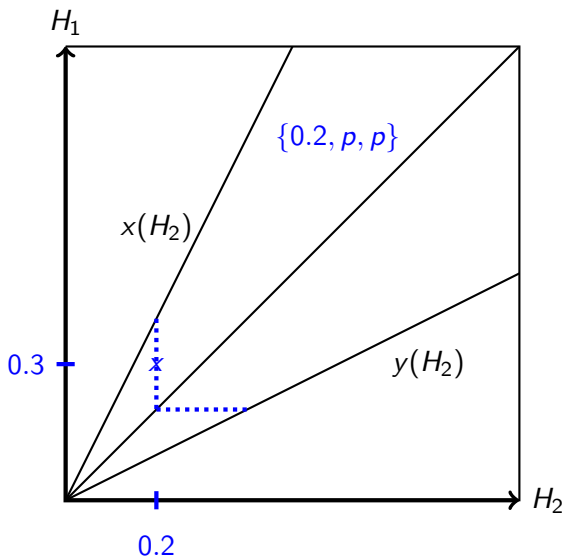
Information Contagion: Example



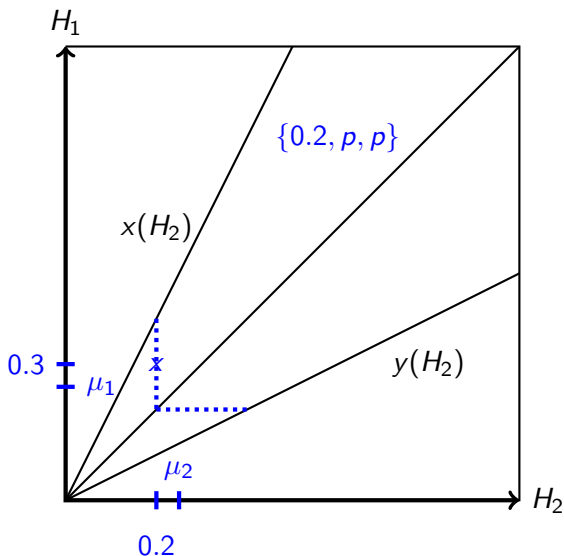
European Stress Test 2011



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Conclusion

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Central bank design: Central Bank Design Problem Central Bank Design Solution

- HRF can be socially optimal
 - ▶ enhance market discipline vs enable risk-sharing
- Strategic delegation creates additional benefits

Theory contribution: Costs of a bank run

- Characterize the equilibrium of a novel verifiable disclosure game

Thank you!