

# Optimal Severity of Stress Test Scenarios

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Discussion by Cecilia Parlato

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# Motivation

**Question** What is the optimal stress test design?

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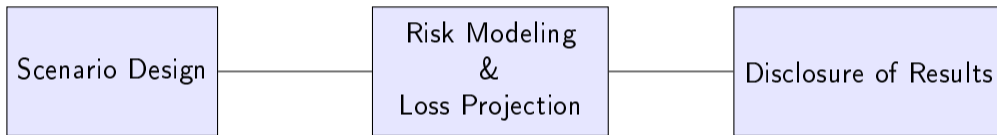
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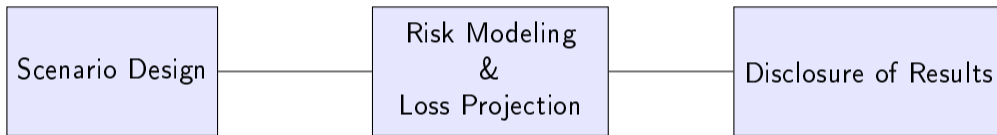
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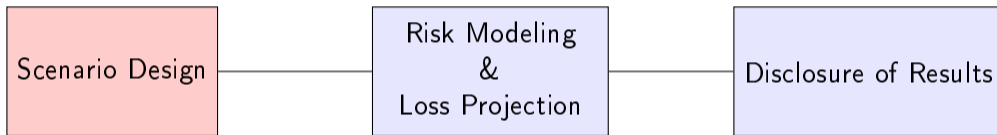


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- ▶ **This paper:** Optimal severity of stress scenario

# Environment

►  $t = 0, 1, 2$

**t=1** Representative bank maximizes representative investor's utility

$$\max_{E_1 \in [0, E_0], L_1 \geq 0} (E_0 - E_1) + \mathbb{E}_{r_{2,l}} [E_2] - \text{Var}_{r_{2,l}} [E_2]$$

subject to

$$E_2 = r_{2,l}L_1 + E_1 - r_d(L_1 - E_1)$$

$$\frac{E_1}{L_1} \geq \chi \quad (\text{minimum equity constraint})$$

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**t=0** Supervisor chooses stress scenario to maximize

$$\max_{\tilde{r}_{2,l}} \mathbb{E}_{r_{1,l}} [L_1] - \text{Var}_{r_{1,l}} [L_1]$$

where  $r_{2,l} = \mu_l + \rho r_{1,l} + \sigma_l \varepsilon_1$

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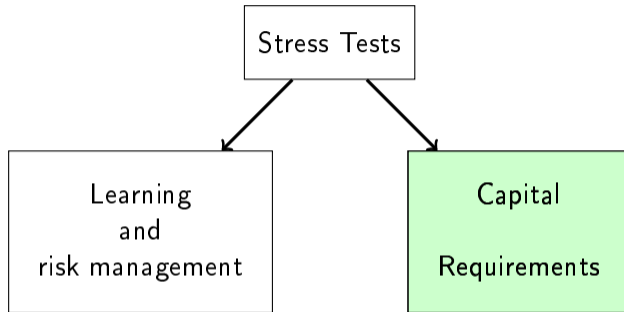
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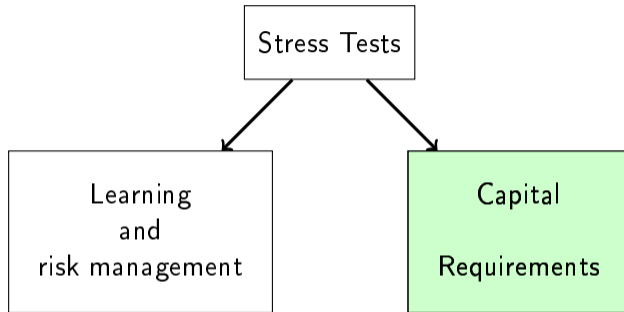
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6. Stress test design vs. severity of scenario



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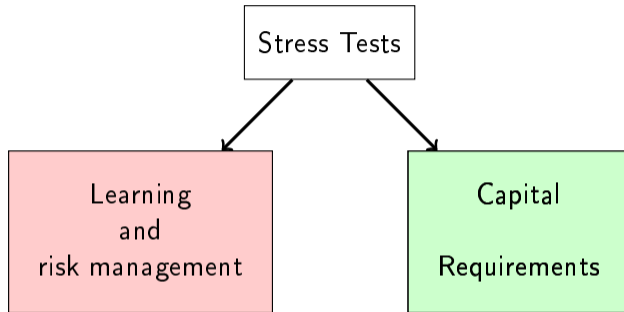
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- ▶ Calibration results:
  - ▶ Gains from optimal stress test design are small if can only use broad capital requirements
  - ▶ Value of optimally designed stress tests is higher when targeted interventions are available