The Long Term Effects of COVID-19

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Interest Rates and Rare, Disasterous Events

- What are the long-term effects of COVID-19?
  - for output?
  - for interest rates?
- Why would effects persist after disease is contained?
  Belief scarring, capital scarring (intertwined)
- Tail (extreme, adverse) events typically scar beliefs.
  Fear deters investment, makes riskless, liquid assets more desirable.
- Changing technologies, preferences and habits scar capital quality depreciates.

Our finding: **Scarring will depress output and investment substantially, and interest rates modestly, for decades to come.**
2 Scenarios: Infections → Shutdowns → Scarring

Probability distribution of returns on capital before and after COVID:

**Scenario 1:**
Aggressive Shutdown

Beliefs with $\tilde{\phi} = 0.9$

**Scenario 2:**
Lax Response

Beliefs with $\tilde{\phi} = 0.95$
Long-Run Output Losses

Scenario 1

Scenario 2

Long-Term Costs

<table>
<thead>
<tr>
<th>2020 GDP Loss</th>
<th>Belief Scarring</th>
<th>Obsolete Capital</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>-9%</td>
<td>-52%</td>
<td>-38%</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>-6%</td>
<td>-33%</td>
<td>-24%</td>
</tr>
</tbody>
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Total cost: 57-90% of a year’s GDP. **Ten times larger than one-year cost.**
Belief scarring deters risky investment.
Capital scarring alone prompts investment in new tech.
Long-run predictions, without policy intervention:

Modest financial changes (Scenario 1)

<table>
<thead>
<tr>
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<th>Scenario 1</th>
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<tbody>
<tr>
<td>Credit Spreads (bps)</td>
<td>0.5</td>
</tr>
<tr>
<td>Equity /Assets</td>
<td>0.01</td>
</tr>
<tr>
<td>Risk free rate</td>
<td>-0.67%</td>
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</tbody>
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Belief scarring makes liquid, safe assets valuable: $R^* \downarrow 67$ bps.