

The Long Term Effects of COVID-19

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Interest Rates and Rare, Disasterous Events

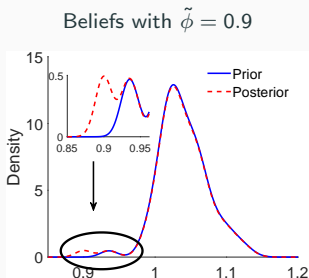
- What are the long-term effects of COVID-19?
 - for output?
 - for interest rates?
- Why would effects persist after disease is contained?
Belief scarring, capital scarring (intertwined)
- Tail (extreme, adverse) events typically scar beliefs.
Fear deters investment, makes riskless, liquid assets more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

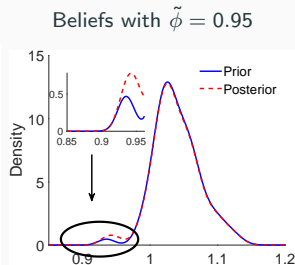
2 Scenarios: Infections \rightarrow Shutdowns \rightarrow Scarring

Probability distribution of returns on capital before and after COVID:

**Scenario 1:
Aggressive Shutdown**

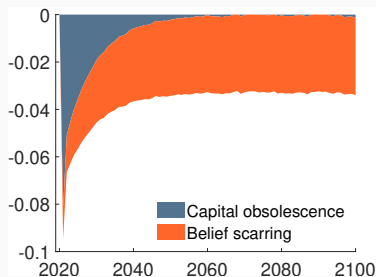


**Scenario 2:
Lax Response**

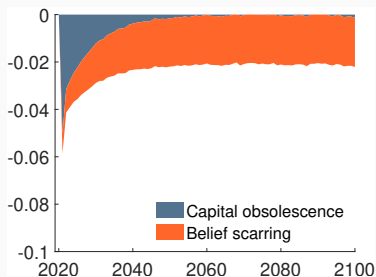


Long-Run Output Losses

Scenario 1



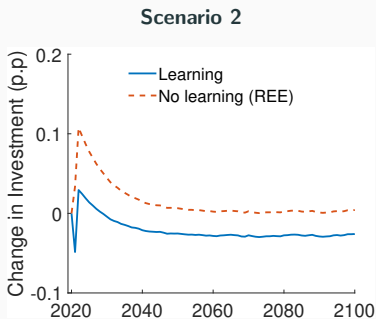
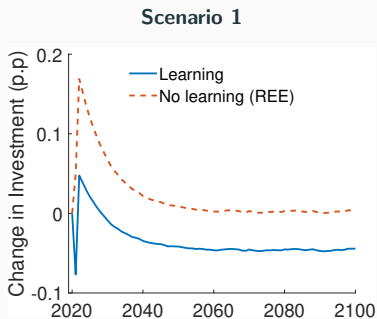
Scenario 2



	Long-Term Costs			
	2020	NPV in % of 2019 GDP		
	GDP loss	Belief Scarring	Obsolete Capital	Total
Scenario 1	-9%	-52%	-38%	-90%
Scenario 2	-6%	-33%	-24%	-57%

Total cost: 57-90% of a year's GDP. **Ten times larger than one-year cost.**

Results: Average Future Investment



Belief scarring deters risky investment.

Capital scarring alone prompts investment in new tech.

The Future of the Risk Free Rate, R^*

Long-run predictions, without policy intervention:

Modest financial changes (Scenario 1)

Credit Spreads (bps)	0.5
Equity /Assets	0.01
Risk free rate	-0.67%

Belief scarring makes liquid, safe assets valuable: $R^* \downarrow$ 67 bps.

Scenario 1

