

Scarring Body and Mind: The Long-Term Belief-Scarring Effects of COVID-19

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Based on research with Laura Veldkamp (Columbia University) and Venky Venkateswaran (New York University).

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Warm-up poll: Back to 2019 & forward to 2030

Let's start with some warm-up poll questions. We will go back and forward in time!



Photo credit: Universal Pictures.

- Rewind. Imagine we are at the September 2019 Dialogue with the Fed.
- What probability would you assign to a global pandemic happening in the next 10 years? (National shutdown, school closures, etc.)
 - 1. 0%, never imagine this can be possible
 - 2. Between 0 and 1%, extremely unlikely but it might happen
 - 3. Between 2% and 4%, it is a low probability event that we consider
 - 4. More than 4%, it's a risk that we consider

- Fast-forward nine years. We've experienced COVID-19, we are now at a Dialogue with the Fed in September 2030.
- What probability would you assign to a new global pandemic happening in the next 10 years?
 - 1. 0%, never imagine this can be possible
 - 2. Between 0 and 1%, extremely unlikely but it might happen
 - 3. Between 2% and 4%, it is a low probability event that we consider
 - 4. More than 4%, it's a risk that we consider

After seeing a tail event (a large negative shock) we change our expectations.

► This is belief scarring.

- Why would effects persist after the pandemic is contained? COVID made the economy feel riskier:
 - COVID-19: small mortality risk, a new variant, etc.
 - Belief scarring: Low probability events with large economic consequences Learning that the impossible is possible

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- "Scarring Body and Mind: The Long-Term Belief-Scarring Effects of COVID-19" with Laura Veldkamp and Venky Venkateswaran, 2020 Jackson Hole Economic Policy Symposium
 - Our goal: Quantify this belief scarring effect.
 - Our finding: Belief scarring will depress output and investment substantially for decades to come.

What are the effects of fiscal and monetary policy responses?

- Let's do an experiment.
- We will roll a die.
- We cannot see the die.
- We see the outcomes.
- The game consists of assigning probability to different events.



After 60 rolls we have seen 1 to 6 rolled about equally often (10 times each side). What probability would you assign to seeing a zero in the next 10 rolls?

1. 0%

2. Between 0 and 1%

3. Between 2% and 4%

4. More than 4%



Roll 61 is a zero!

Learning that the impossible is possible

Now, what probability would you assign to seeing a zero in the next ten rolls?

1. 0%

2. Between 0 and 1%

3. Between 2% and 4%

4. More than 4%

No one knows the true distribution of aggregate shocks.

• We re-estimate beliefs as new data arrives.

Frequencies of past events inform our estimated probabilities of future ones.

- For ordinary events, we have lots of data. One more observation doesn't change much.
- A tail event is an extreme adverse realization (e.g. COVID, the 2007-2008 financial crisis) and creates large, long-lived changes in beliefs or tail probabilities.

How can we quantify these changes in beliefs?

We use a histogram with the observed data.

Measuring belief scarring



Before Tail Event



- **Tail events** induce large changes in tail risk (hump on left).
- Changes in tail risk are long-lived even without future crises.

ONCE BITTEN, TWICE SHY.

How do we quantify fear?

Fearing a bad event more means perceiving it as more probable. This increases the perceived likelihood of a large negative shock for the next decades.



Photo credit: max-kegfire/iStock via Getty Images

Model: Macroeconomic model with production and bankruptcy

Beliefs: Investors and firms estimate future risks to capital using real-time data and a non-parametric estimator (like histograms of past data).

SIR model: Disease spreads through human contact.

Shutdowns: Reducing contact requires temporary shutdown, induces capital obsolescence. Changing tastes and technologies make some capital obsolete.

We calibrate and simulate the model and report predicted outcomes.



No belief revisions \rightarrow quick rebound Belief scarring \rightarrow persistent effects Fiscal and monetary policy responses \rightarrow Look at cross-country experiences

Fiscal stimulus



Source: IMF database of fiscal policy responses to COVID-19, July 2021 release. Note: Weighted (World Bank 2019 GDP by purchasing power parity) average of total fiscal policy response by country type.

Monetary policy: Total assets in central bank's balance sheets



Sources: Bloomberg, FRED, Central Banks, and author's calculation. Note: Total assets held by central banks, relative to February 2019.

Rich countries did whatever it took to mitigate the shook, while middle- and low-income countries did whatever they could.

What are the long-term projections for these countries?

Deviation in GDP from pre-pandemic forecasts



Sources: IMF World Economic Outlook, Oct. 2019 release and April 2021 release. Note: Weighted by country type using the World Bank 2019 GDP by purchasing power parity data.

- The after-effects of COVID-19 will be with us for a while to come. Tail events permanently reshape our assessment of macroeconomic risks.
 - COVID-19 \rightarrow small mortality risk
 - Belief scarring \rightarrow low probability events with large economic consequences

Fiscal and monetary responses seem very effective in preventing the long-term consequences of belief scarring.

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APPENDIX

Monetary policy: Effective policy rate



Sources: Bloomberg, FRED, Central Banks, and author's calculation. Note: Effective policy rate.

Fiscal response: Romer & Romer



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	Advanced	Emerging market	Low-income	Total
	economies	and developing economies	developing countries	
Fiscal and GDP	32	58	40	130
Balance sheet	19	14		33
Interest rate	11	23		34
Romer & Romer	26	4		30



Source: IMF database of fiscal policy responses to COVID-19, July 2021 release.



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Fiscal response and economic performance



Where do the long-run losses come from?

- Capital obsolescence: Takes time to replenish capital (less office space, fewer planes, etc.)
- Future pandemics: Pandemics recur with approx $\frac{1}{70}$ probability
- Belief scarring: Fear of new pandemics reduces investment



Long-term costs are many times larger than immediate economic losses

-9%

-38%

-12%

-52%