

**Two Hundred Years of Rare Disasters:  
Financial Center Crises, Social Revolts, and Pandemics**

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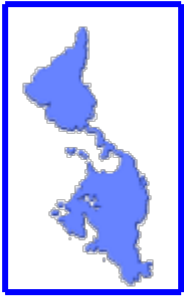
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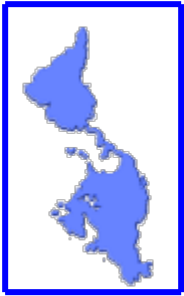
***American Economic Association Meeting***

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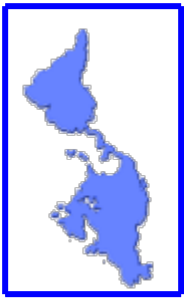
## **Covid-19 Crisis: What To Expect?**

- **The Covid-19 epidemic erupted in China in 2019. It became a Pandemic and also a global economic crisis in 2020.**
- **This is not all. The collapse in economic activity has triggered banking fragilities in both developing and advanced economies.**
- **Many countries have also experienced currency crises and sovereign defaults.**
- **What to Expect?**
- **The Covid-19 Crisis is is not a regular crisis. It is a **Rare Disaster**.**
- **To assess what to expect about the severity and persistence of this worldwide crisis, we need to learn about prior rare disasters.**



## What We Do

- We identify eight rare disasters in the last two hundred years. They include crises with the financial center at their epicenter, social revolts, and pandemics.
- We study financial and economic distress around the world during those eight rare disasters.
- We quantify both the severity and persistence of financial and economic distress.
- We also study whether monetary policy in the financial center can reduce the severity and duration of both financial and economic distress.
- We evaluate separately the first and second episode of financial globalization since the ability of conducting monetary policy during the first episode was limited by the Gold Standard.

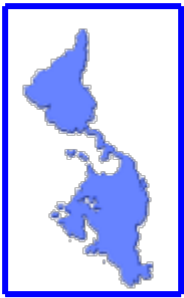


# Rare Financial Disasters

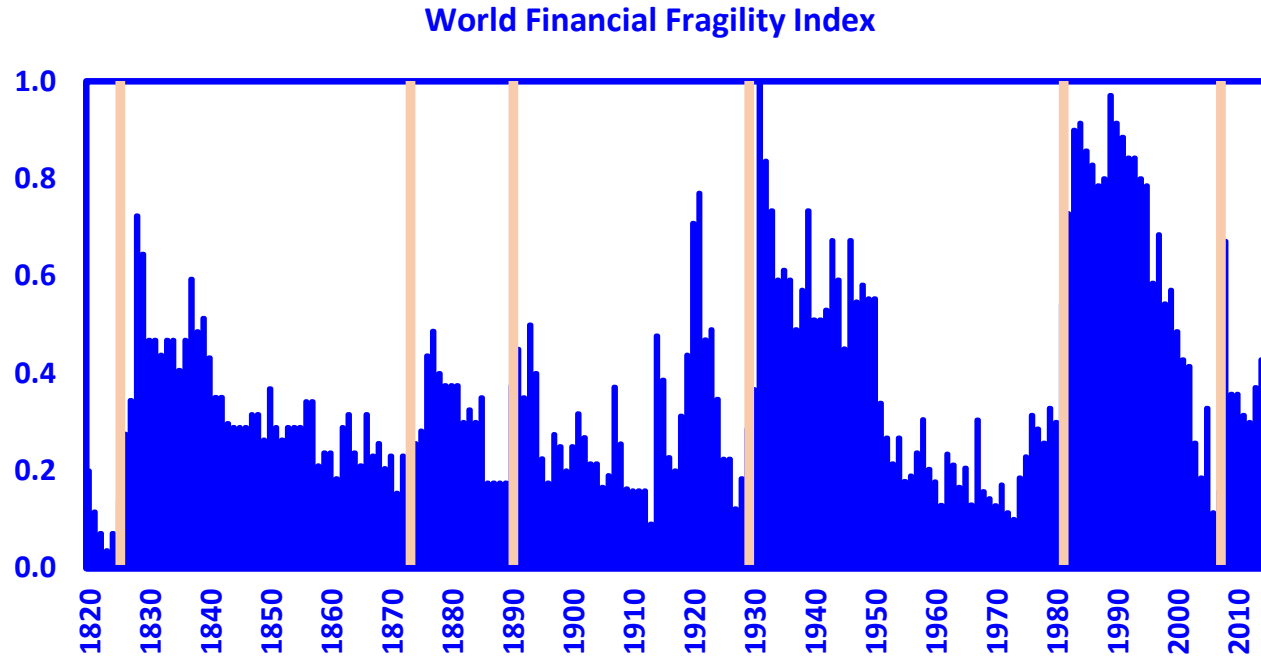
- To identify rare financial disasters, we use as a yardstick the extent of crises around the world, captured with the number of banking, currency, and sovereign debt crises.
- We use the Reinhart, Rogoff, and Trebesch (2016) database on crises. This database identifies years of banking, currency, and sovereign debt crises for 70 countries from 1800 to 2016. We complement this database with information on crises from other authors.

$$\textit{World Financial Fragility Index}_t = \frac{\sum_{i=1}^{N_t} [b_t^i + c_t^i + sd_t^i]}{N_t}$$

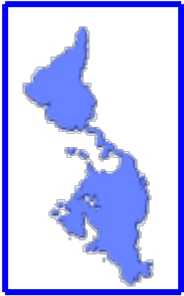
- This index quantifies the average number of banking, currency, and sovereign debt crises per country. It fluctuates between zero (when none of the countries in the sample have crises) and 3 (when all the countries in the sample have banking, currency, and sovereign debt crises).



# Rare Financial Disasters

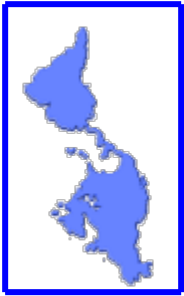


- The World Financial Fragility Index is shown in blue.
- Interestingly, the surge in crises worldwide is preceded by a crisis in the financial center. The pink lines identify the year of financial center crisis.



# Rare Financial Disasters

- **First Episode of Financial Globalization**
  - 1825 London Panic
  - 1873 Germany and Austria Stock Market Crash
  - 1890 Baring Crisis
  - 1929 London and New York Panics
- **Second Episode of Financial Globalization**
  - 1981-1983 U.S. Bank Crisis (centered on major commercial banks with large exposures to developing countries)
  - 2007-2009 U.S. Subprime Crisis
  - Covid-19 crisis



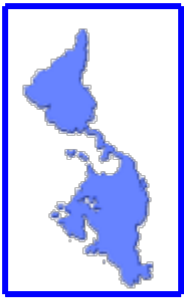
# Rare Non-Financial Disasters

- **1848-49 Social Revolts**

- The social revolts started in Europe in January 1848. These revolts started in Sicily and spread around Europe with the highest intensity in the Austrian Empire, Belgium, France, Germany, and Italy. Financial turmoil during this episode spread around the world.

- **1918-1919 Pandemic**

- The 1918-1919 Influenza was the deadliest pandemic in history. It infected an estimated 500 million people worldwide, about one-third of the planet's population. The total estimated deaths oscillates between 20 million to 50 million.



# Data

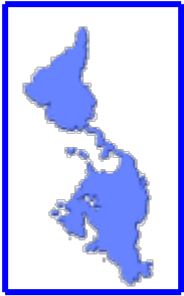
## Financial Data

- **First Episode of Financial Globalization**
  - We collected manually daily bond prices in the secondary market from a variety of publications and newspapers of the 19<sup>th</sup> and early 20<sup>th</sup> centuries. We use those prices together with the bond coupon to estimate bond yields. The data starts in 1824 and ends in 1938.
- **Second Episode of Financial Globalization**
  - We collected daily EMBI Spreads from JP Morgan and yields from FRED St Louis Fed, and the OECD.

## Economic Data

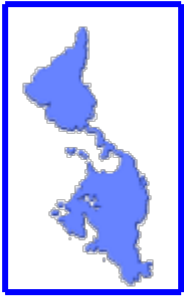
- **First Episode of Financial Globalization**
  - Real GDP per capita from the Madison Project, and Barro-Ursúa Database.
  - Exports from External Statistics Reports from a variety of countries and collections from scholars, such as, Federico and Junquito, and Jacks.
- **Second Episode of Financial Globalization**
  - Real GDP per capita from the World Bank
  - Exports from the IMF WEO.





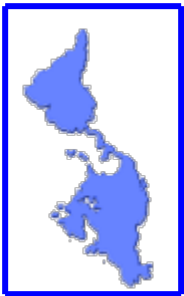
# Countries in the Database

- **Latin America:** Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Ecuador, Mexico, Panama, Paraguay, Peru, and Uruguay.
- **Africa, Asia/Pacific Region and Oceania:** Algeria, Australia, China, Egypt, India, Japan, New Zealand, South Africa, Thailand, and Vietnam.
- **Europe:** Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Turkey, Poland, Portugal, Romania, Russia, Serbia, Spain, Sweden, United Kingdom.
- **North America:** Canada and U.S.



## Estimating Severity and Time to Recovery

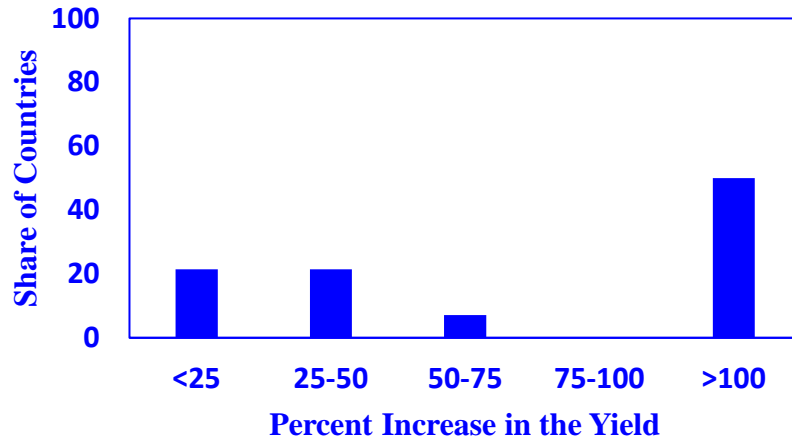
- To quantify the severity of economic (financial) fragility, we use the Harding and Pagan (2002) algorithm. This algorithm identifies local peaks and troughs.
- We identify the economic (financial) severity of each crisis by estimating the decline (increase) in economic activity (bond yields) from peak (trough) to trough (peak) of the closest cycle around each event. We estimate the years to recovery for each event as the years needed for the economy (bond yields) to return to the previous peak (trough).



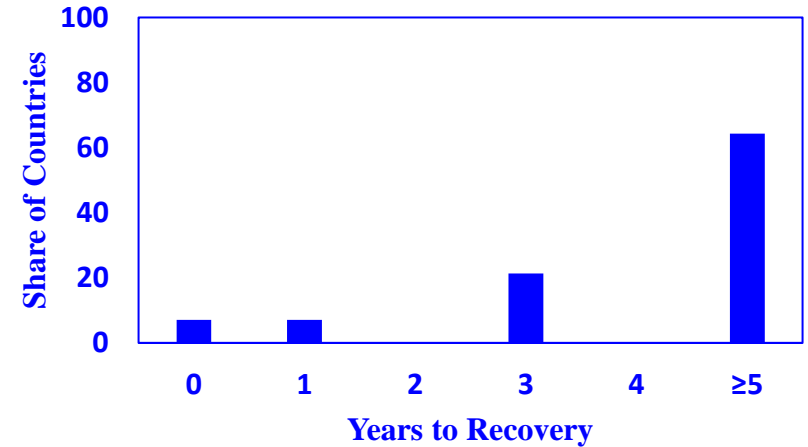
# The 1825 London Panic

## Financial Fragility

### Severity

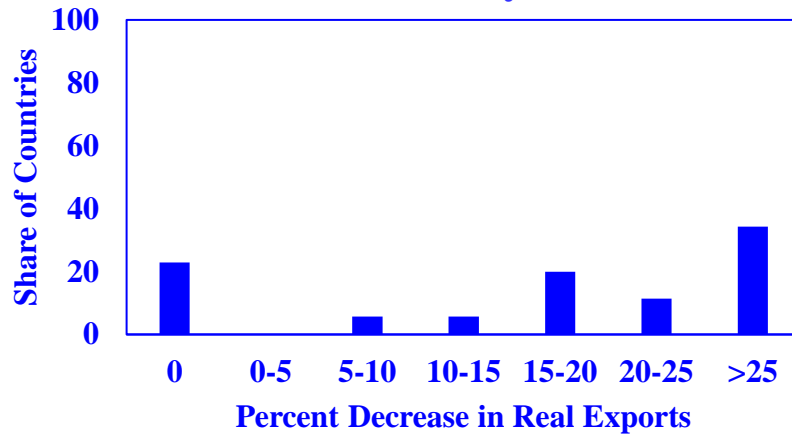


### Persistence

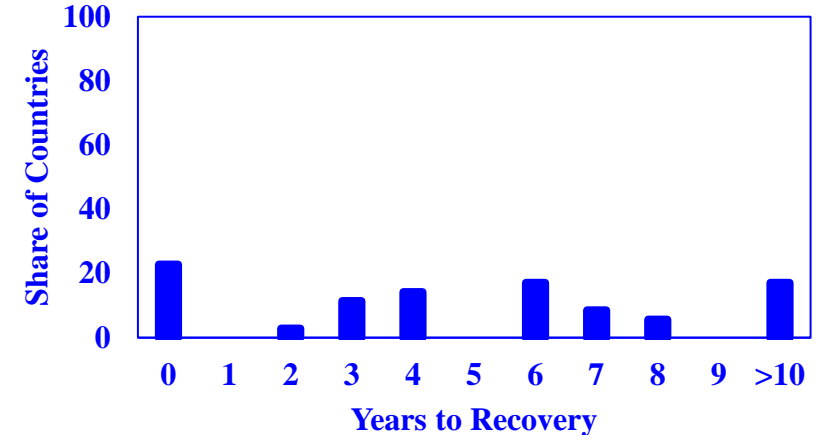


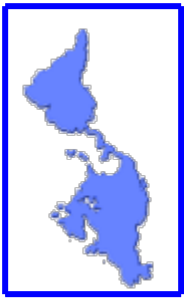
## Economic Fragility

### Severity



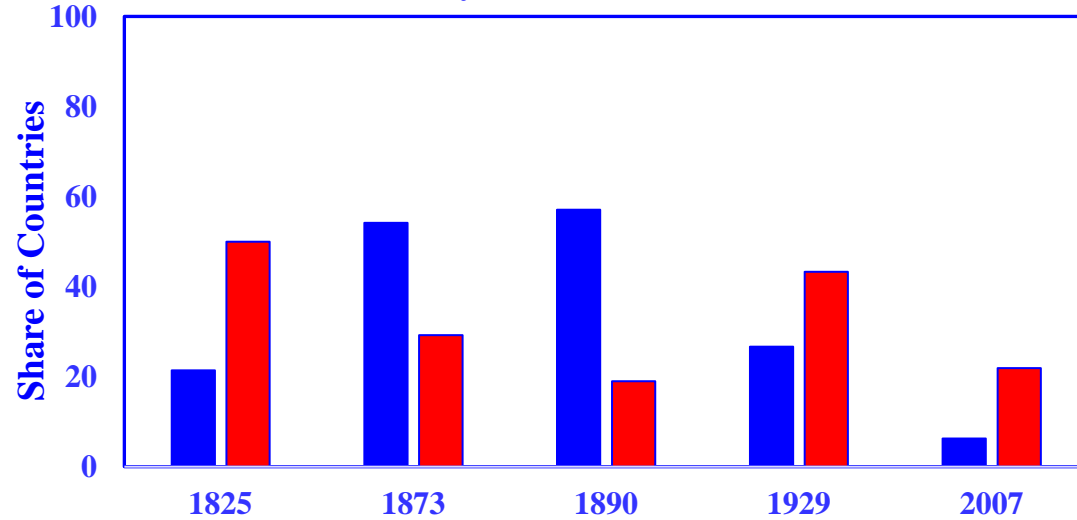
### Persistence



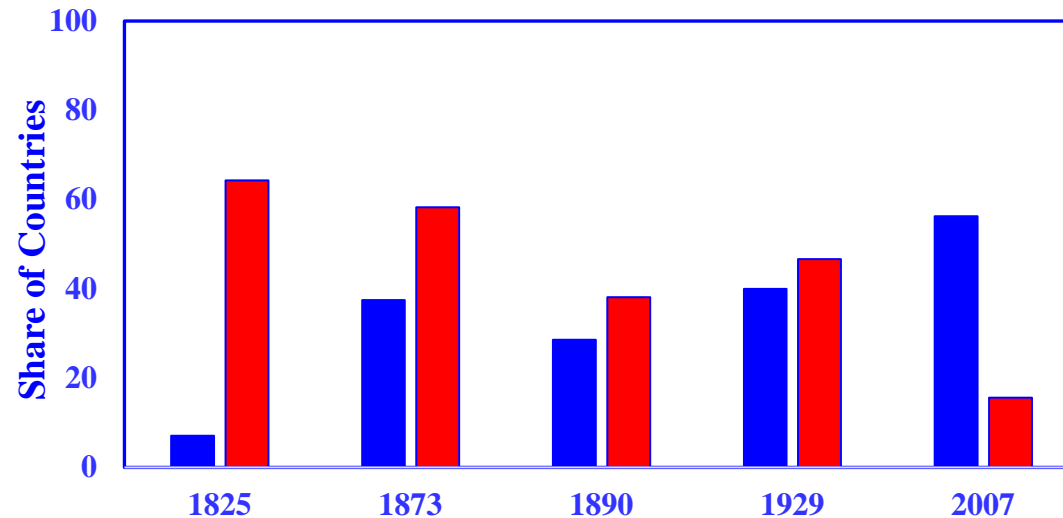


# Financial Distress

### Severity of Financial Distress



### Persistence of Financial Distress



**Low Risk**

**High Risk**

**Low Risk:**  
Increase in Yields < 25%

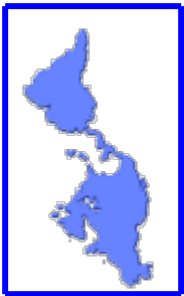
**High Risk:**  
Increase in Yields > 100%

**Short-Lived Risk**

**Long-Lived Risk**

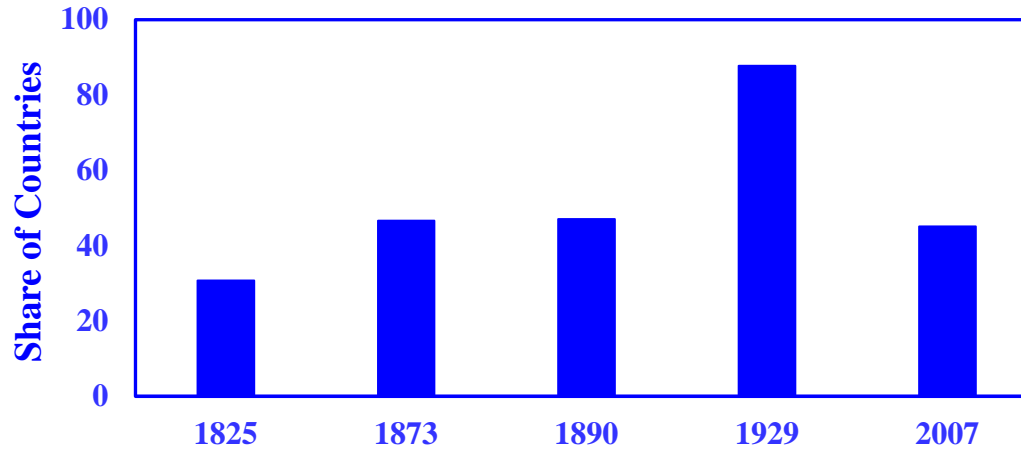
**Short-Lived Risk:**  
Return to Normal < 1 year

**Long-Lived Risk:**  
Return to Normal > 5 years



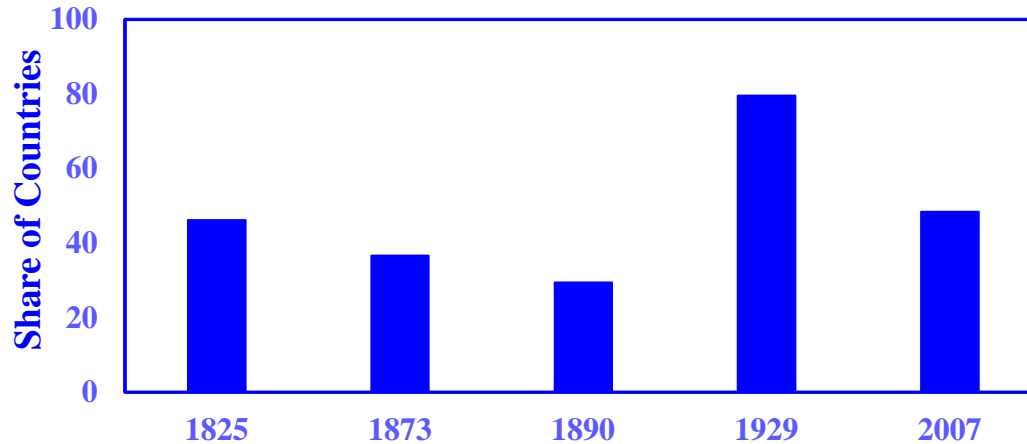
# Economic Distress

## Severity of Economic Distress

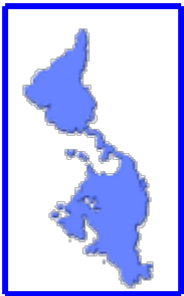


Note: High Economic Distress captures a collapse in economic activity of 5% or more. Economic Activity is captured with Real GDP per Capita.

## Persistence of Economic Distress

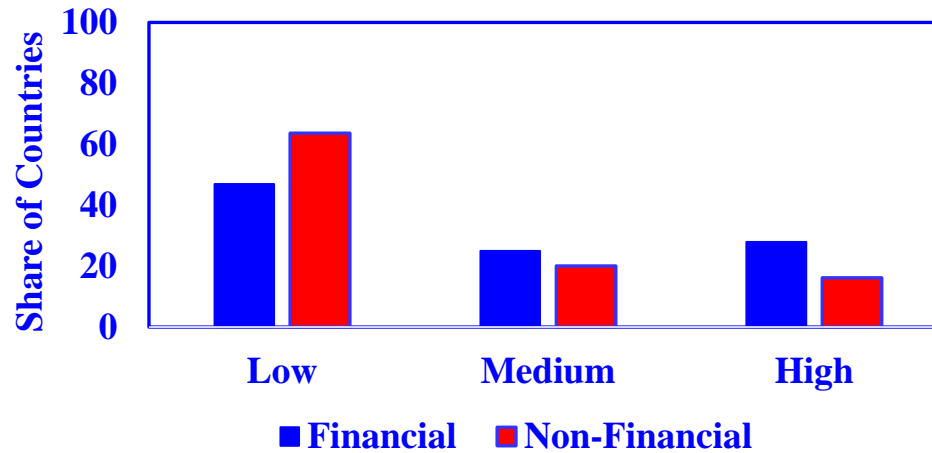


Protracted Economic Distress indicates that economic activity only returns to normal times after 5 or more years. Economic Activity is captured with Real GDP per Capita.

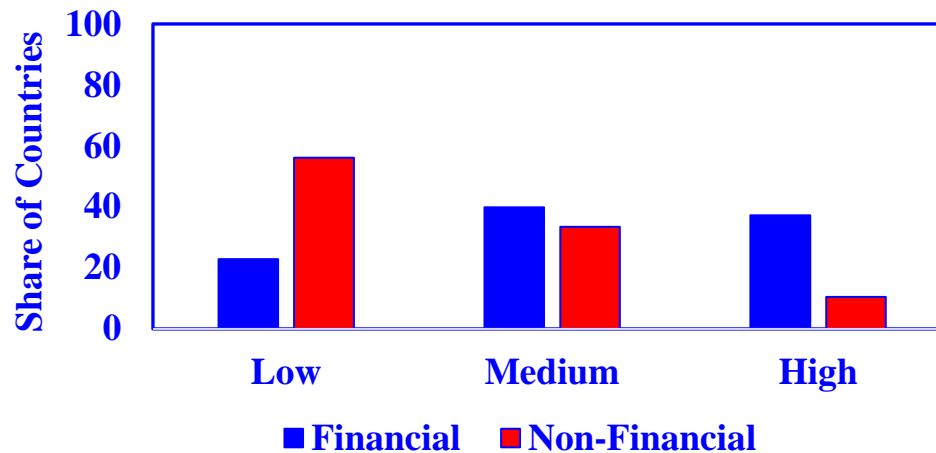


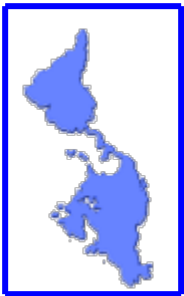
## Financial and Non-Financial Rare Disasters: Economic Distress

Severity of Economic Distress



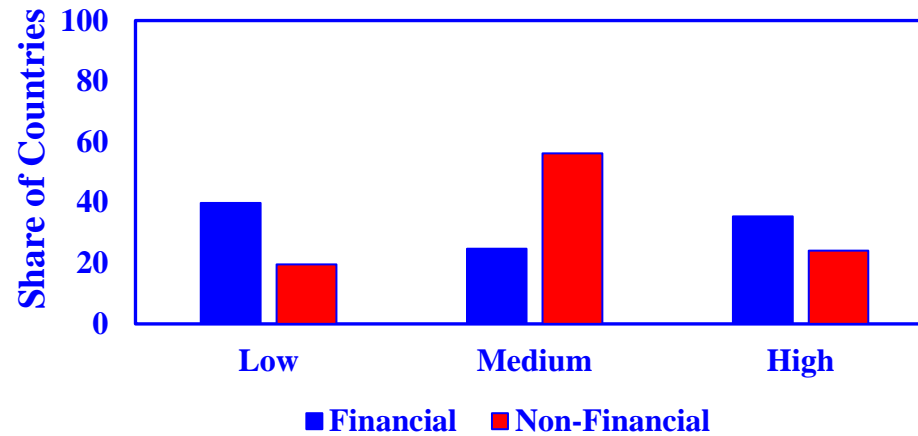
Persistence of Economic Distress



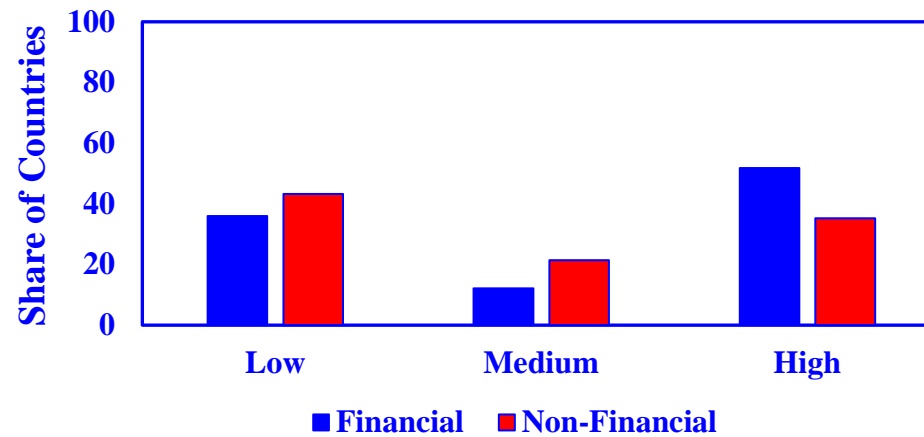


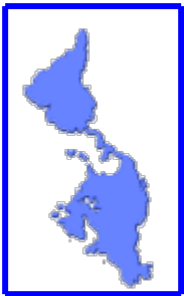
## Financial and Non-Financial Rare Disasters Financial Distress

Severity of Financial Distress



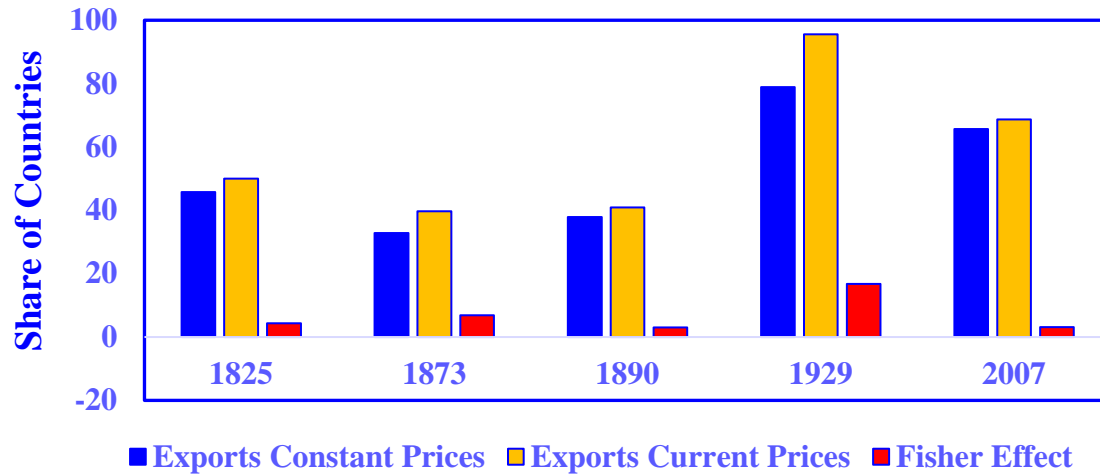
Persistence of Financial Distress



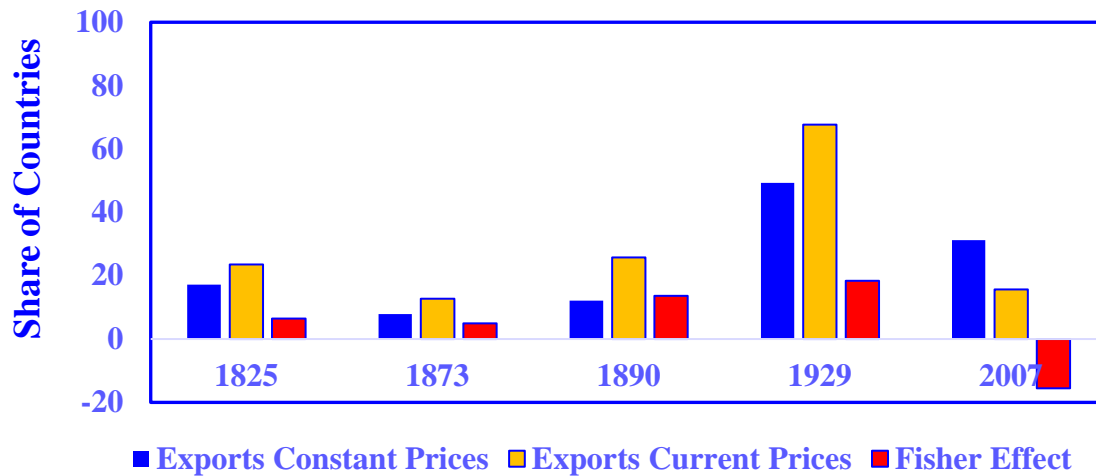


# Economic Distress: The Fisher Effect

### Severity of Economic Distress



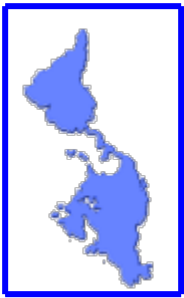
### Persistence of Economic Distress



High Severity Economic Distress indicates that economic activity falls more than 20 percent. Economic Activity is captured with Exports at constant and current prices.

Protracted Economic Distress indicates that economic activity only returns to normal times after 10 or more years. Economic Activity is captured with Exports at constant and current prices.



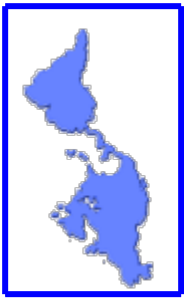


## Monetary Policy: Effects on the Severity of Financial and Economic Distress

- We examine the role of monetary policy in the financial center on the severity of financial and economic distress. For the first episode of financial globalization, we capture monetary policy in the financial center with the Bank of England interest rate. For the second episode of financial globalization, we capture monetary policy with the Shadow Federal Funds interest rate.
- We use Jordà (AER, 2005) Local Projections and Ramey and Zubairy (JPE, 2018) modifications to estimate the effect of monetary policy in the Financial Center on bond yields and economic activity allowing for time-varying effects:

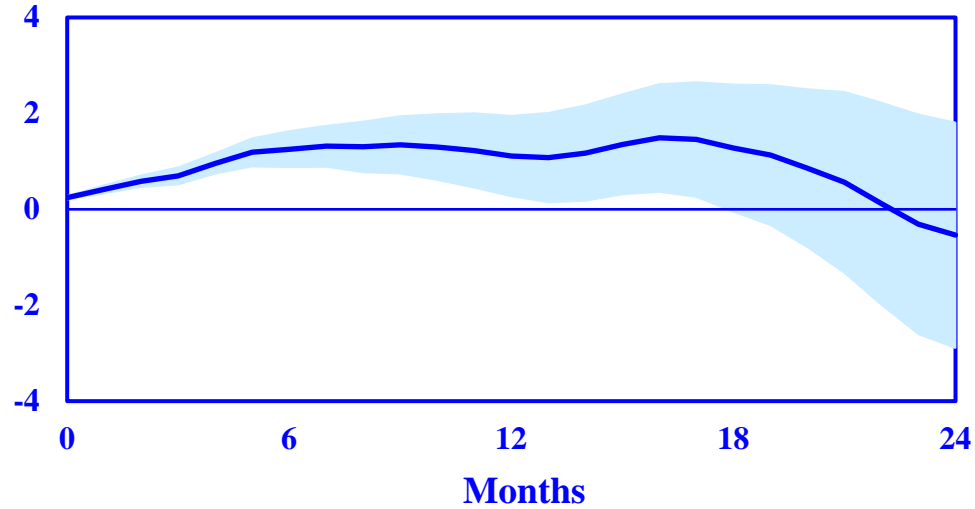
$$F_{t+h} = I^f \left[ \alpha_h^f + \beta_h^f(L)F_{t-1} + \gamma_h^f fc_t \right] + I^s \left[ \alpha_h^s + \beta_h^s(L)F_{t-1} + \gamma_h^s fc_t \right] + \varepsilon_{t+h}$$

- Where  $F$  is alternatively the accumulated changes in bond yields and the accumulated growth in economic activity,  $fc$  is the financial center monetary policy interest rate, and  $I^f$  ( $I^s$ ) is a dummy variable equal to one during the first (second) episode of financial globalization. The coefficient  $\gamma_h$  gives the response of  $F_{t+h}$  to  $fc_t$ .
- The superscript  $f$  ( $s$ ) refers to the **first** (**second**) episode of financial globalization.

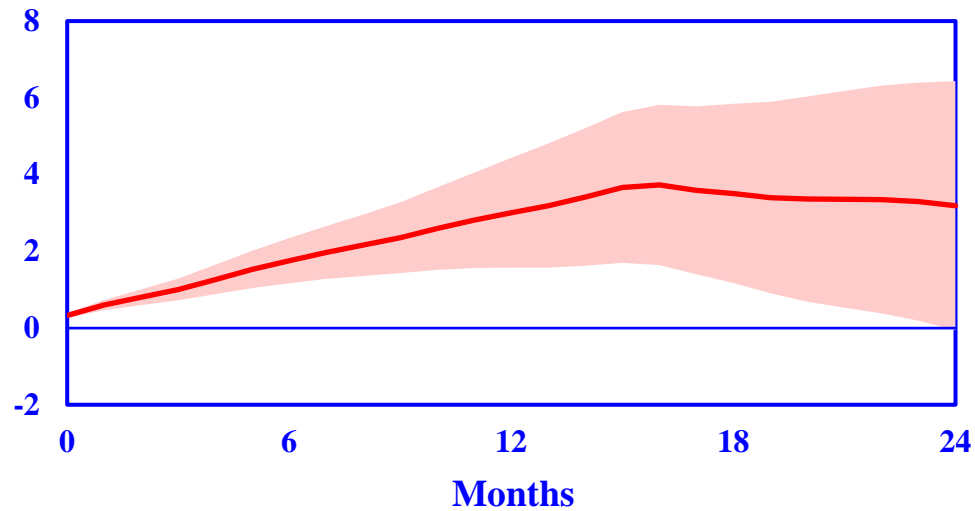


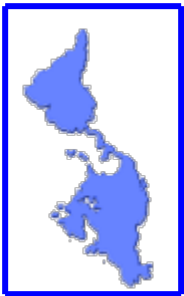
# The Effect of Monetary Policy on Bond Yields

## First Episode of Financial Globalization



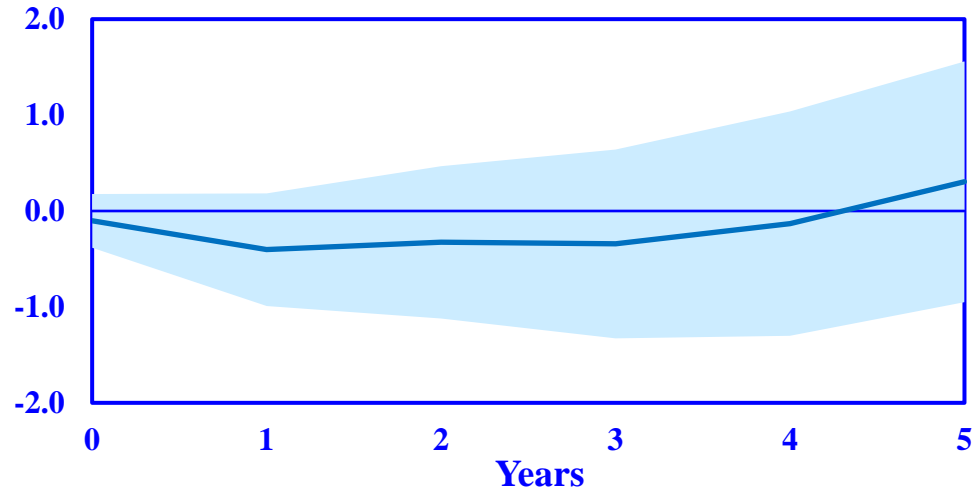
## Second Episode of Financial Globalization



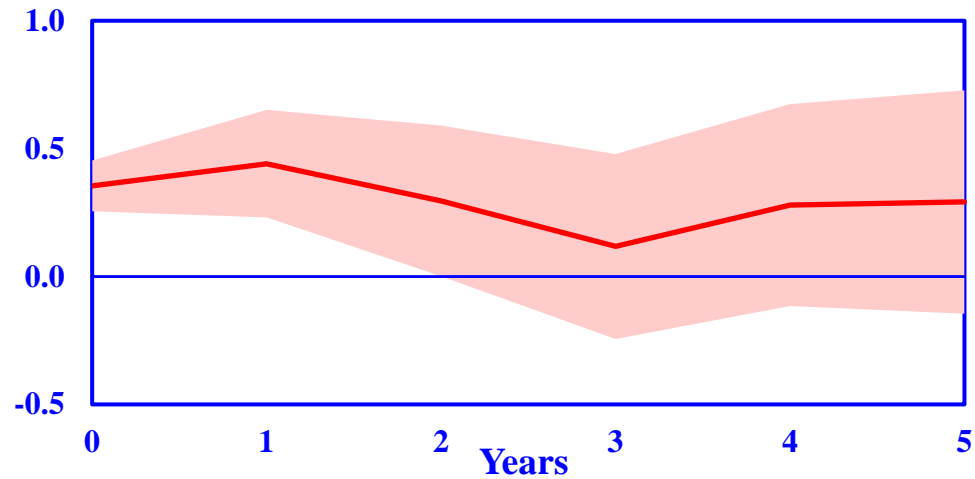


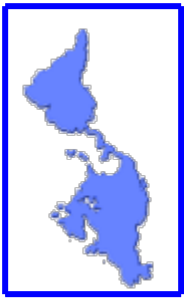
# The Effects of Monetary Shocks on Economic Activity

## First Episode of Financial Globalization



## Second Episode of Financial Globalization

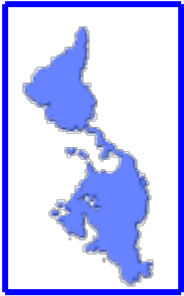




## Does Monetary Policy Help the Economy to Recover Faster?

Episodes	Indicator	Coefficient	p-Value	Response of the Probability of Recovery to a One Percentage point increase in Interest Rate	Number of Recoveries	Number of Observations
First Episode of Financial Globalization	interest rate (London)	-0.04	0.20	-0.04	67	716
Second Episode of Financial Globalization	Shadow federal funds rate	-0.14	0.25	-0.14	24	140

Notes: This table shows the coefficients of a Cox proportional hazard model. The dependent variable is a dummy variable equal to "0" in the years the country is in recession and equal to "1" in the year when the country returns to the prior peak. A positive coefficient indicates that a higher value of the explanatory variable is associated with a shorter duration of the default spell.



# Reflections

- We started with a question: What to expect from the Covid-19 Crisis?
- To answer this question, we examined a variety of Rare Disasters, both financial and non-financial.
- Crises with the Financial Center at their Epicenter are different. Recessions are long lasting and far more severe.
- What to do? Monetary policy?
- During the Gold Standard, Central Banks could not implement a cyclical monetary policy.
- With the collapse of the Bretton Woods System, Central Banks in the Financial Center and around the world, started to implement counter cyclical monetary policy and even quantitative easing, starting during the so-called Global Crisis.
- Our findings suggest that cyclical monetary policy reduces financial distress but not economic distress.
- The aftermath of these crises both then and now are characterized by higher levels of debt burden, with deflation increasing the debt burden during the Gold Standard, and Quantitative Easing triggering higher debt with no deflation. In both cases, economic activity collapses.