

# Discussion: Sovereign Default and the Decline in Interest Rates

Max Miller, James Paron, Jessica Wachter

**Carolyn Pflueger**

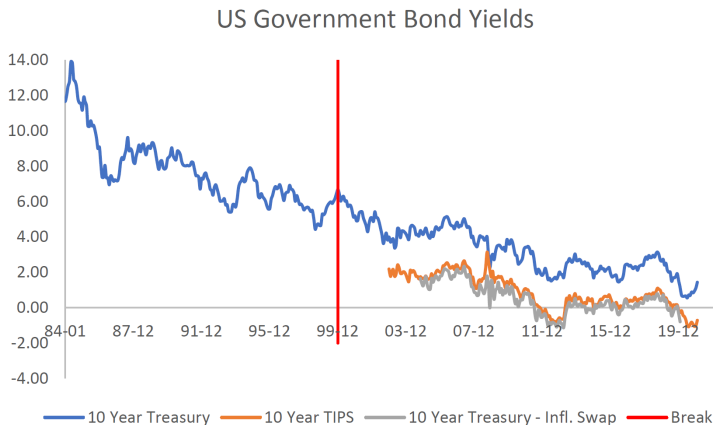
University of Chicago, Harris School of Public Policy

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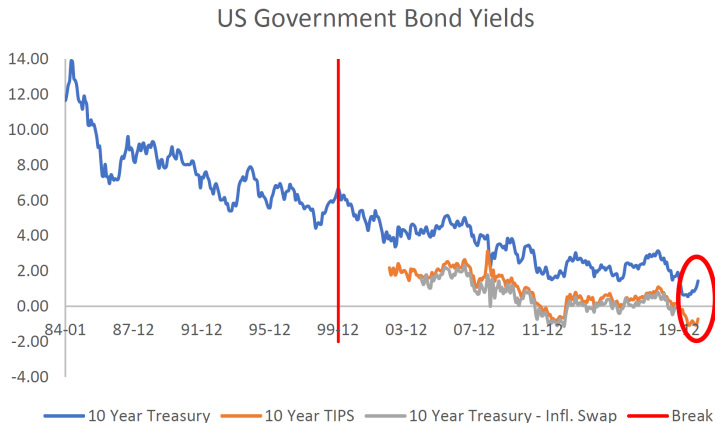
# Motivation

- ▶ Government bond yields have declined
- ▶ But expected returns on equities have not
- ▶ Explanation for puzzling real bond yields must drive wedge between required returns on stocks and bonds
  - Increased patience?
  - Lower economic growth ( $r^*$ )?
  - **Decline in default risk via inflation!**

# Persistent Decline in Treasury Bond Yields



# Recent Uptick



- ▶ Uptick Mostly in Inflation Component
- ▶ SPF Prob(inflation $\geq$ 3.5%) increased from 0 to 2% in 2021.Q1



# Outline

## ► Summary

- Default/inflation
- Inventory

## ► Comments

- Great paper! Joint macro-finance trends are puzzling and important
- Story is quite plausible, especially for long-term bonds
- Implications for term structure and real vs. nominal bonds?
- Pin down inflation risk with data?

# SUMMARY

# Disasters and Default/Inflation

- ▶ Disaster probability:  $p$
- ▶ Consumption decline in disasters:  $z$
- ▶ Treasury bond payoff in disasters:  $\exp(-\zeta z)$ 
  - $\zeta > 0$ : inflationary disasters
  - $\zeta = 0$ : risk-free government debt

# Change in Inflationary Disasters Explains Valuations

- ▶ Preferred calibration implies 17.9% disaster inflation in period 1, but only 1.6% disaster inflation in period 2
- ▶ Slight increase in patience  $\beta$  from first period to second
- ▶ Results insensitive to exact values for growth ( $\mu$ ) or EIS
- ▶ Inflation risk premium explains decline in government bond yields

# Real Investment and Inventory

- ▶ Secular decline in real investment
- ▶ Introduce inventory: Storage technology with zero real return
- ▶ When government bond yield hits ZLB, inventory becomes attractive
- ▶ Explain decline in real investment and endogenize lower growth in second period

# COMMENTS

# Overall Assessment

- ▶ Secular movements in bond yields, stock valuations, and real investment are puzzling
- ▶ Rather than relying on the fragile implications of an increase in the disaster probability ( $p$ ) this paper combines inflation with disasters gives a powerful and plausible decline in bond yields
- ▶ Change in inflation risk around 2000 supported by switch in bond-stock return correlation from positive to negative (Campbell, Pflueger, and Viceira (2020))

# Calibrated pre-2000 disaster inflation (17.9%) within realm of historical experience

Country	Beginning of period covered	Share of years in which inflation exceeded		Number of years of hyperinflation <sup>a</sup>	Maximum annual inflation	Year of peak inflation
		20 percent	40 percent			
Europe						
Austria	1800	20.8	12.1	2	1,733.0	1922
Belgium	1800	10.1	6.8	0	50.6	1812
Denmark	1800	2.1	0.5	0	48.3	1800
Finland	1861	5.5	2.7	0	242.0	1918
France	1800	5.8	1.9	0	74.0	1946
Germany	1800	9.7	4.3	2	2.22E + 10	1923
Greece	1834	13.3	5.2	4	3.02E + 10	1944
Hungary	1924	15.7	3.6	2	9.63E + 26	1946
Italy	1800	11.1	5.8	0	491.4	1944
The Netherlands	1800	1.0	0.0	0	21.0	1918
Norway	1800	5.3	1.9	0	152.0	1812
Poland	1800	28.0	17.4	2	51,699.4	1923
Portugal	1800	9.7	4.3	0	84.2	1808
Russia	1854	35.7	26.4	8	13,534.7	1923
Spain	1800	3.9	1.0	0	102.1	1808
Sweden	1800	1.9	0.0	0	35.8	1918
Turkey	1800	20.5	11.7	0	115.9	1942
United Kingdom	1800	2.4	0.0	0	34.4	1800
Latin America						

Source: Reinhart and Rogoff (2009)



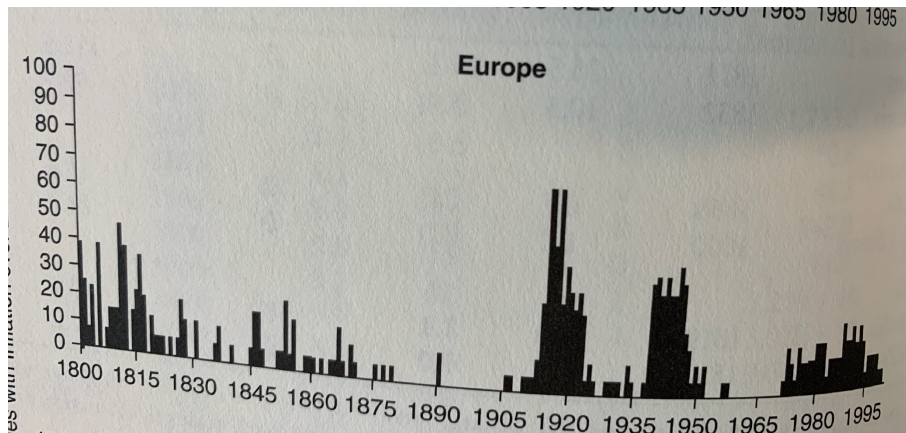
# Historical Disaster Inflation (US, Canada, Australia)

## 12. INFLATION AND MODERN CURRENCY CRASHES

TABLE 12.3 Continued

Country	Beginning of period covered	Share of years in which inflation exceeded		Number of years of hyperinflation <sup>a</sup>	Maximum annual inflation	Year of peak inflation
		20 percent	40 percent			
Latin America (continued)						
Uruguay	1871	26.5	19.1	0	112.5	1990
Venezuela	1832	10.3	3.4	0	99.9	1996
North America						
Canada	1868	0.7	0.0	0	23.8	1917
United States	1800	1.0	0.0	0	24.0	1864
Oceania						
Australia	1819	4.8	1.1	0	57.4	1854
New Zealand	1858	0.0	0.0	0	17.2	1980

# Time-Series Disaster Inflation

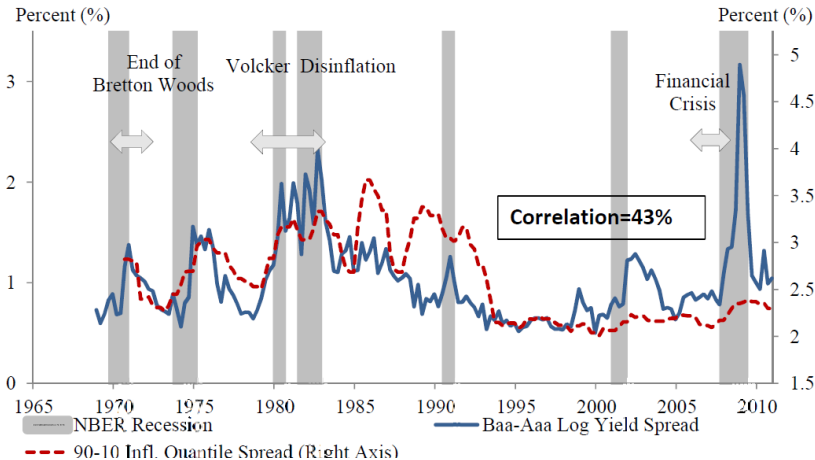


Percent countries with inflation >20%.

Source: Reinhart and Rogoff (2009)

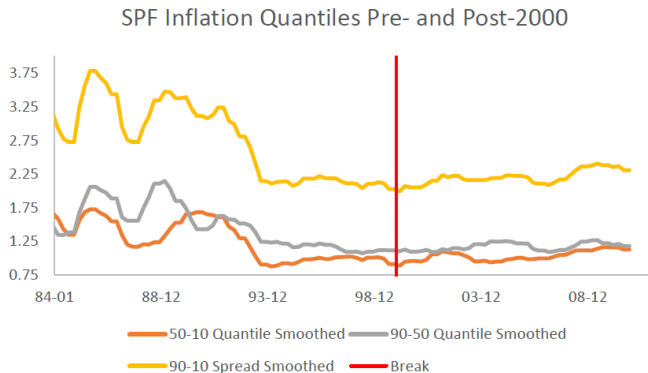
# Inflation Quantiles from SPF Support Decline in US Inflation Uncertainty

**Panel A: Inflation Uncertainty**



Source: Kang and Pflueger (2015), Figure 1

# Decline in Upper Inflation Quantiles



- ▶ SPF has asked respondents about probabilities of various inflation outcomes since 1970
- ▶ Use this data to discipline changes in perceived disaster inflation?

# Short-Term vs. Long-Term Bonds?

- ▶ Model real yield on one-year nominal government bond

$$y_{b,t} = r_f + \log(1 + p(e^{\gamma z} - 1)) - \log\left(1 + p(e^{-(\zeta - \gamma)z} - 1)\right) - \mu_{\pi,t} + \frac{1}{2}\sigma_{\pi}^2$$

- ▶ Government bond pays off  $e^{-\zeta z}$  in disaster state
- ▶ Inflation risk greater at longer horizons than short horizons
- ▶ Example: Permanent increase in inflation from 2% to 12% leads to a -10% return on 1-year nominal bond, -40 % return on 5-year nominal bond
- ▶ Conversely, if inflation is known 3 months in advance, rolling over 3-month T-bill has no inflation risk, but 5-year bond may have substantial inflation risk
- ▶ Calibrate to long-term bonds?

# Summary

- ▶ Disaster-based channel for persistent decline in government bond yields
- ▶ US Government less likely to experience disasters associated with inflation
- ▶ Can additional inflation and term structure moments further pin down this channel?