Discussion of "Exorbitant Privilege Gained and Lost: Fiscal Implications"

by Chen, Jiang, Lustig, Van-Nieuwerburgh, Xiaolan

Presented in UCLA Fink Center Conference on Financial Markets (2023)

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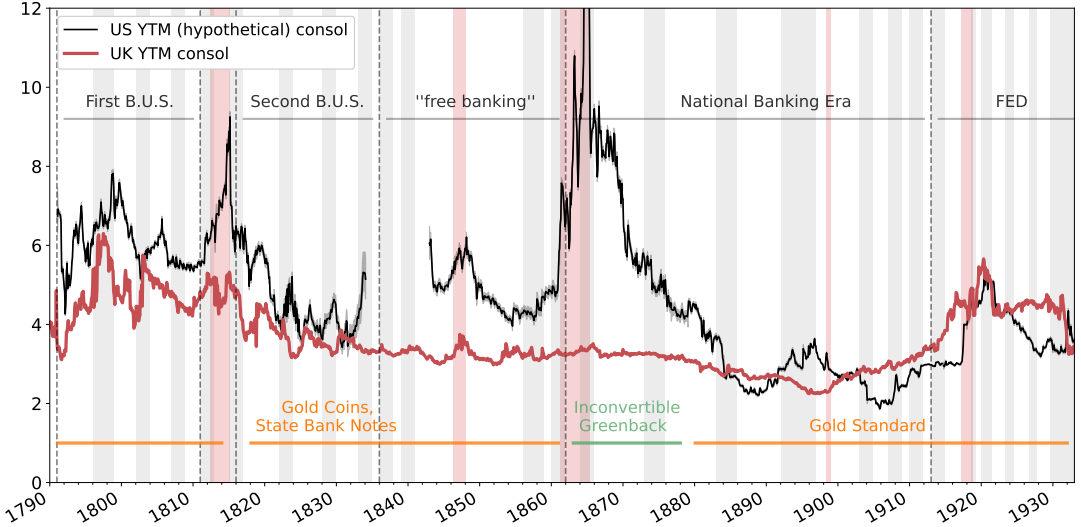
Introduction

- ⋆ Ambitious paper that studies four centuries of Dutch, UK, and US fiscal history.
- ⋆ Calculates the "fiscal backing" of the Dutch, UK, and US governments:
  - ⋆ Uses similar technique to Jiang, Lustig, Van Nieuwerburgh, Xiaolan (2019)
  - ⋆ Forecasts dynamics of taxes, spending, and GDP
  - ⋆ "Fiscal backing" = PDV[future surpluses + convenience seigniorage]
- ⋆ Argues only dominant safe asset issuer can issue debt without full fiscal backing:
  - ⋆ Pre-1794, 2/3 of Dutch debt backed by surpluses; after 1814, fully backed.
  - ⋆ Pre-WWI, 3/4 UK debt backed by surpluses; Post-WWII, fully backed.
  - ⋆ Pre-WWII, US debt fully backed by surpluses; Post-WWII, only 1/3 US debt backed.
- ⋆ Lesson: exorbitant privilege (issuing debt without fiscal backing) is not permanent!

UK Yields Lower Than US Yields Until 1880s



Black line=posterior mean with $5-95\%$ iq-range. Gray=recessions. Red=wars. (Hall, Payne, Sargent, & Szőke, 22).

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PDV of Net Revenue ("Fiscal Backing")

- Authors estimate ratio of present discounted value of future net revenues to GDP:

$$\frac{\hat{D}_t}{Y_t} := \frac{1}{Y_t}\mathbb{E}_t\left[\sum_{j=0}^{\infty} \underbrace{M^{\$}_{t,t+j}}_{\text{SDF}} \Big(\underbrace{T_{t+j}}_{\text{Taxes}} - \underbrace{G_{t+j}}_{\text{Spending}} + \underbrace{(1-e^{-\lambda_{t+j}}) \sum_{h=1}^{H} Q^{\$}_{t+j,h} p^{\$}_{t+j}(h)}_{\substack{\text{seigniorage revenue from} \\ \text{convenience yield}}} \Big)\right]$$

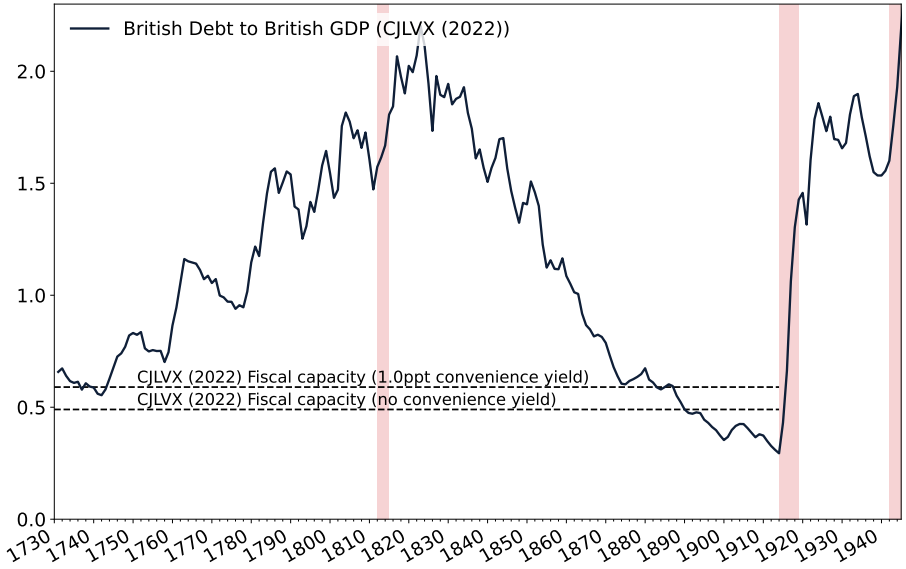
  - Requires estimating future taxes, spending, convenience yields, and SDF risk prices.
  - "Steady state" estimate: "long run average" PDV of future net revenues.
  - Dynamic estimate: estimates VAR for taxes, spending, and other variables.

- Authors interpret $\hat{D}_t/Y_t$ as government debt-to-GDP level that has "fiscal backing"
  - Justification: $\hat{D}_t$ is market value of government debt if no arbitrage and TVC holds
  - Implication: If government debt satisfies $D_t/Y_t > \hat{D}_t/Y_t$, then not fully "fiscally backed".

UK: "Steady State"/"Long-run Average" Fiscal Backing

- For UK over 1729-1914, they estimate:
  - Average Tax-to-GDP (τ_0) $= 9.0\%$
  - Average Spending-to-GDP (g_0) $= 6.6\%$
  - Convenience yield $\approx 1ppt$.
    - Calculated as average spread b/n yield on UK debt and other countries' debt
    - Comparison to: US, Austria, Belgium, France, Germany, Holland, Japan, Italy, Denmark, Finland, Norway, Portugal, Spain, Sweden, Switzerland
  - Tax, spending, and GDP risk premium $\approx 3\%$:
    - Assume same risk premium on taxes, spending, and GDP.
    - Estimate GDP risk premium as premium on unlevered stock market claim.
- Estimates UK debt to GDP ratio that could be fiscally backed:
  - Without convenience yield: $\bar{\hat{D}}/\bar{Y} = 0.49$
  - With convenience yield: $\bar{\hat{D}}/\bar{Y} = 0.59$

UK: Debt/GDP Fiscal Backing vs Actual Debt/GDP



"Dynamic" Estimate of Fiscal Backing $\hat{D}_t/Y_t$

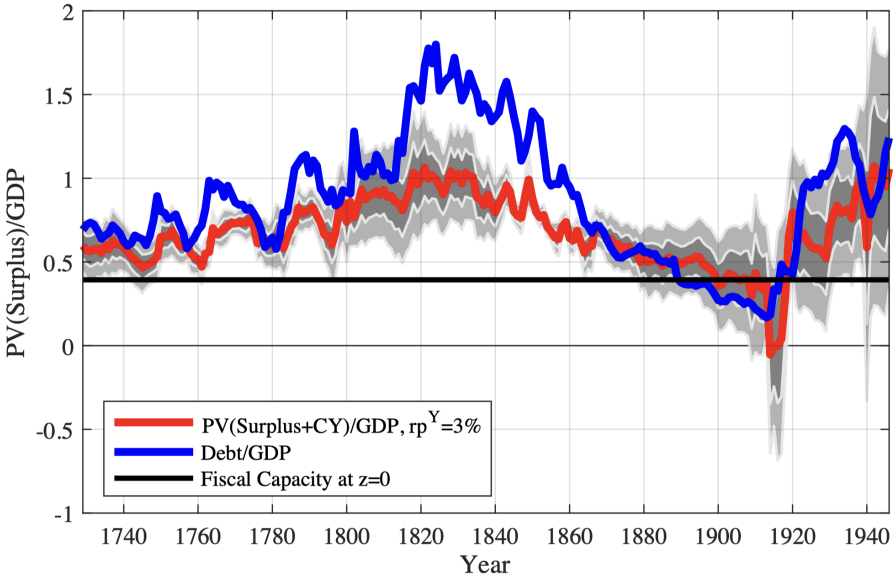
- Fit Gaussian first-order VAR for variables, z_t, below (for different "eras")

$$z_t = \Psi z_{t-1} + u_t, \quad \text{where } u_t \sim i.i.d.N(0, \Sigma) \text{ are homoscedastic innovations}$$

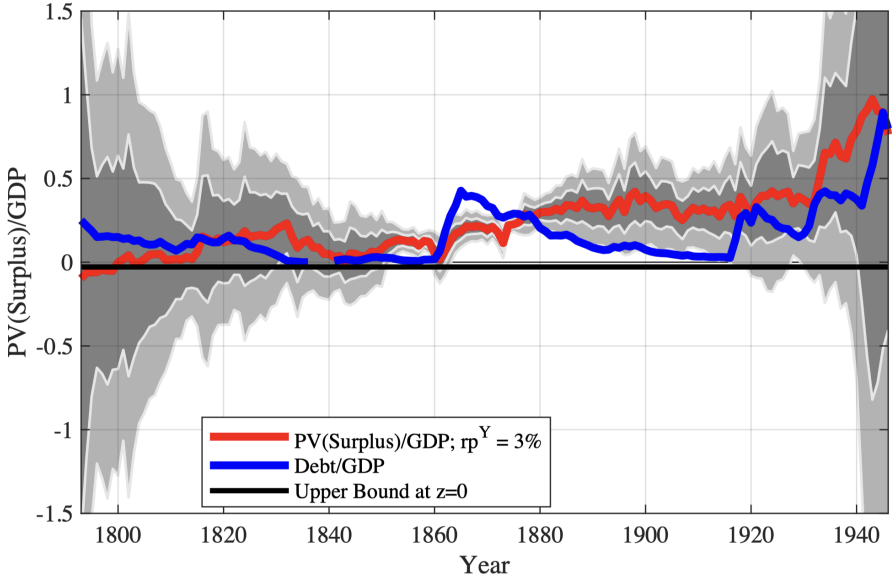
Position	Variable	Mean	Description
1	π_t	π_0	Log Inflation
2	$y_t^{\$}(1)$	$y_0^{\$}(1)$	Log 1-Year Nominal Yield
3	$yspr_t^{\$}$	$yspr_0^{\$}$	Log 10-Year Minus Log 1-Year Nominal Yield Spread
4	x_t	x_0	Log Real GDP Growth
5	Δd_t	μ_d	Log Stock Dividend-to-GDP Growth
6	d_t	$\log d_0$	Log Stock Dividend-to-GDP Level
7	pd_t	$\overline{pd}$	Log Stock Price-to-Dividend Ratio
8	$\Delta \log \tau_t$	μ_τ	Log Tax Revenue-to-GDP Growth
9	$\log \tau_t$	$\log \tau_0$	Log Tax Revenue-to-GDP Level
10	$\Delta \log g_t$	μ_g	Log Spending-to-GDP Growth
11	$\log g_t$	$\log g_0$	Log Spending-to-GDP Level

- Uses estimate VAR to calculate PDV of net government revenues to GDP at each t.

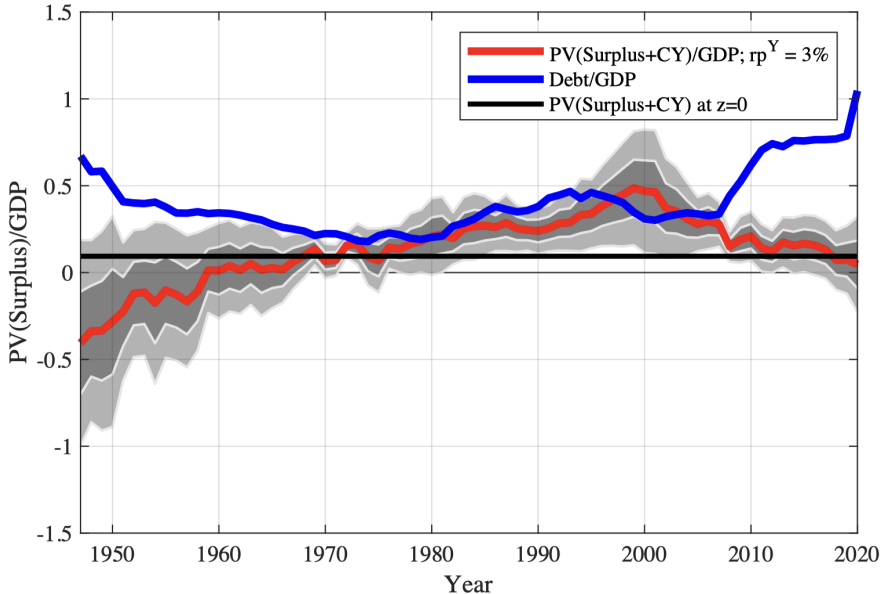
Dynamic Fiscal Backing: UK (1729–1946)



Dynamic Fiscal Backing: US (1793 – 1946)



Dynamic Fiscal Backing: US (1950 – 2022)



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Brief Methodological Comments

- Methodology has similar strengths and weaknesses to JLVX (2019) (which focused on the US in the post WWII period)
- I still feel there are some areas where more clarification would be helpful:
  - Unclear that a fixed parameter VAR makes sense for long time series (e.g. 1729-1946) with potential stochastic trends
  - Unclear that the VAR allows the surplus process to react sufficiently to fiscal constraints
  - Unclear that the model has the right SDF for discounting surpluses
- ...But I am sympathetic to the difficulties of working with these datasets!
- ...And I want to focus on some new issues raised in this paper.

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British Empire and Fiscal Position

- UK borrowed in 18th and 19th century to build colonial empire
- Colonies potentially expanded British capacity to borrow:
  - Potentially increased the UK tax base (explicitly and/or implicitly),
  - Colonies could potentially be sold to service debt (e.g. France selling Louisiana to US)
  - Created captive market for UK debt (colonies "forced" to use UK financial system)
- Incorporate the colonies seems key to understanding UK fiscal backing.

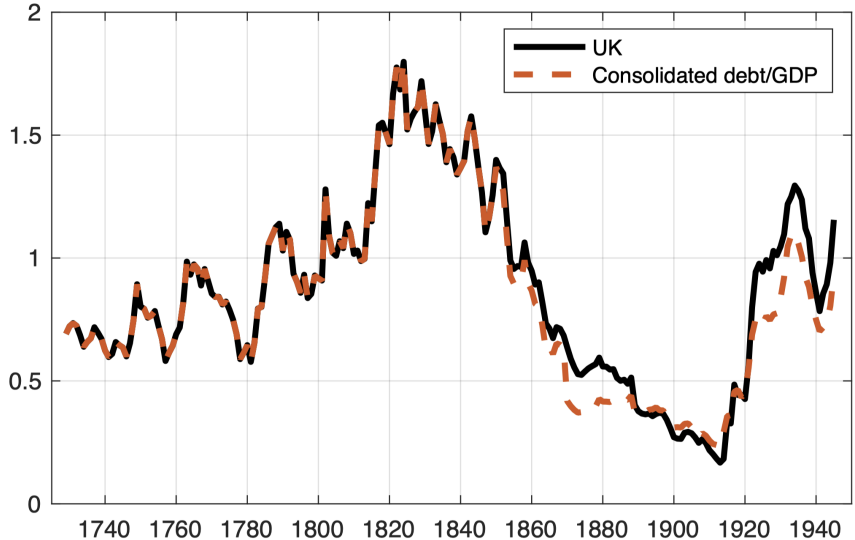
Disclaimer

- ⋆ I am Australian so I am from one of the colonies the UK was taxing
- ⋆ . . . and I have some thoughts on this.

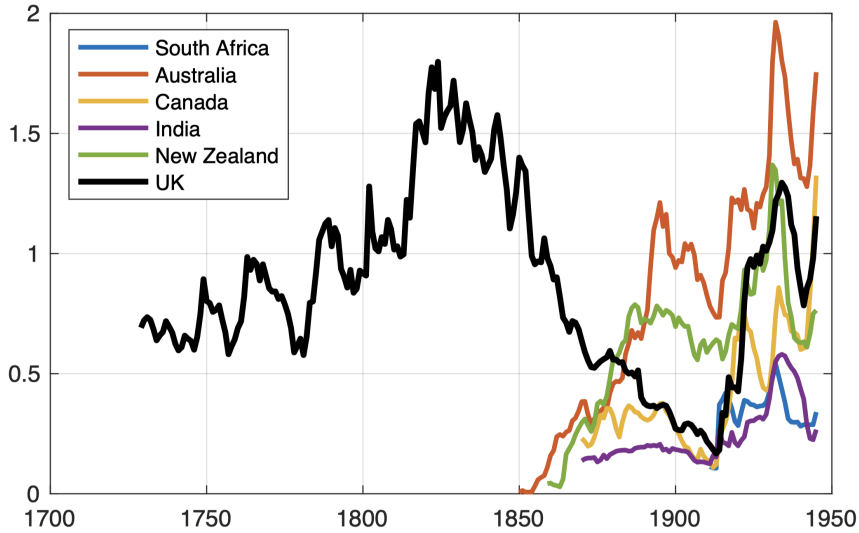
Current Approach (Appendix D.5)

- Authors have added a new discussion of colonial revenue in Appendix D.5.
- They create a consolidated debt/GDP series for the British Empire that:
  - Adds the debt of the British colonies to the debt of the UK government,
  - Adds the GDP of the British colonies to the GDP of the UK government
- They find that the debt/GDP ratio for the British Empire is similar to the UK.
- I am not sure this is correct approach because:
  - It is not clear that the UK government responsible for the debt of the colonies.
  - E.g. we don't assume US federal government is responsible for the debt of the states.
- Assuming their approach is right, I am not sure Empire & UK debt/GDP are similar.

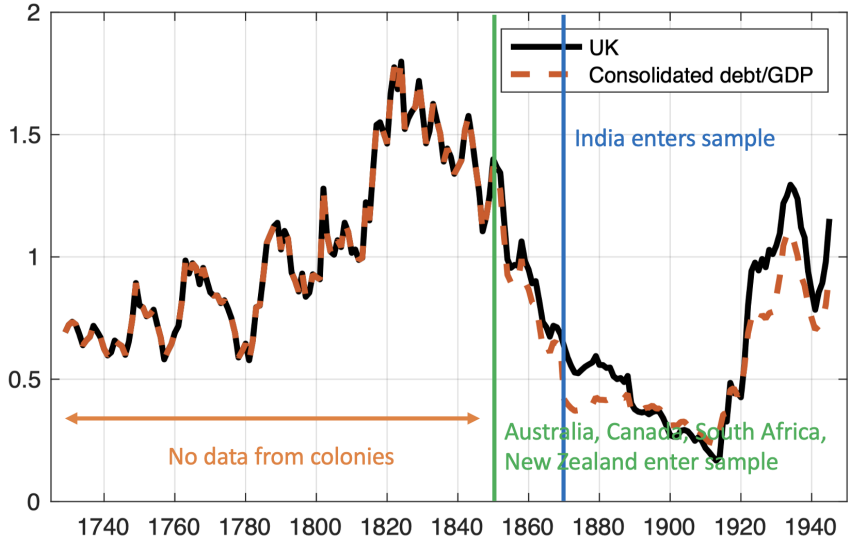
UK Empire Debt-GDP (CJLVX 2022 Estimate)



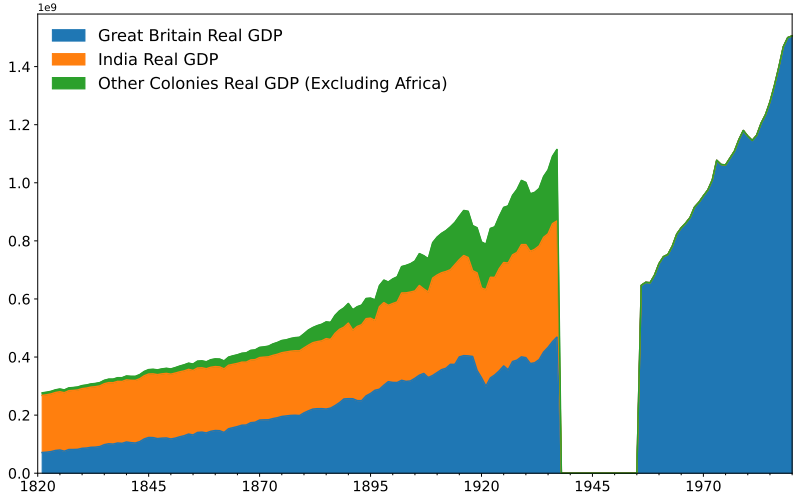
Colonial Debt-GDP (CJLVX 2022 Estimate)



Difficulty: Plots Are Missing Data for Key Periods



Incorporating Indian GDP is Crucial in Early 19th C

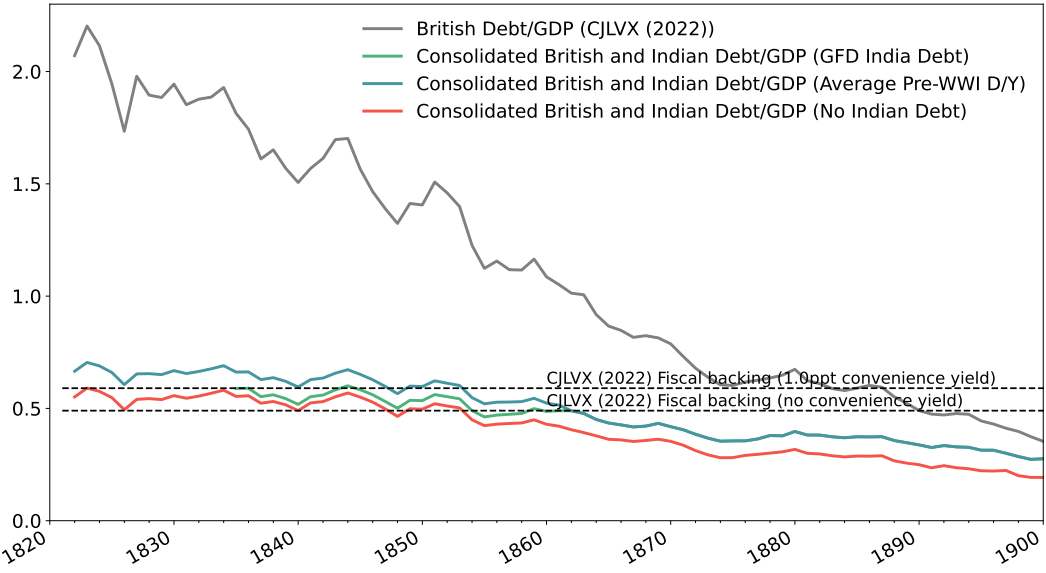


Note: Other colonies include Great Britain, Australia, Bangladesh, Burma, Canada, Hong Kong, India, Iraq, Malaysia, New Zealand, Oman, Singapore. Source: Maddison Project.

Very Rough Extension of Consolidated Debt/GDP

- ⋆ Compute three possible estimates of Indian Debt/GDP for dates Pre-1870:
  - ⋆ Divide GFD India Government Debt (1834-2022) by Madison Project GDP (1820-2022).
  - ⋆ Assume India Debt/GDP(1820-1870) = average India Debt/GDP (1870-1914).
  - ⋆ Assume UK government not liable for any India debt.
- ⋆ Use each series to calculate the Debt/GDP ratio across the UK and India (which I refer to as the consolidated British Empire Debt/GDP).
- ⋆ This under estimates the British empire Debt/GDP in late 19th century (because other colonies borrowed heavily) but is reasonable estimate in the early 19th century.

Possible that Colonial GDP Give UK Fiscal Backing



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US Debt Pricing Changes After Civil War

- Pricing of US Federal debt changes dramatically between Civil War and WWI
- Reflects many policy changes by US Federal Government (and global markets)
- This paper (and other papers by the authors) focus on fiscal policies.
- Payne & Szoke (2023) focus on how financial regulation/segmentation can act as a substitute for fiscal backing by:
  - Changing the bank SDF pricing government debt, and so
  - Changing the price stability and convenience yield on LT government debt.
  - Particularly interested in forced holding of US debt during National Banking Era (1862-1913) and Yield Curve control (1942-51), which is a period with little fiscal backing

Regulation Creates a Market for US Federal Debt

- "Collateral" constraint on banks to back "money creation" with US Federal debt:

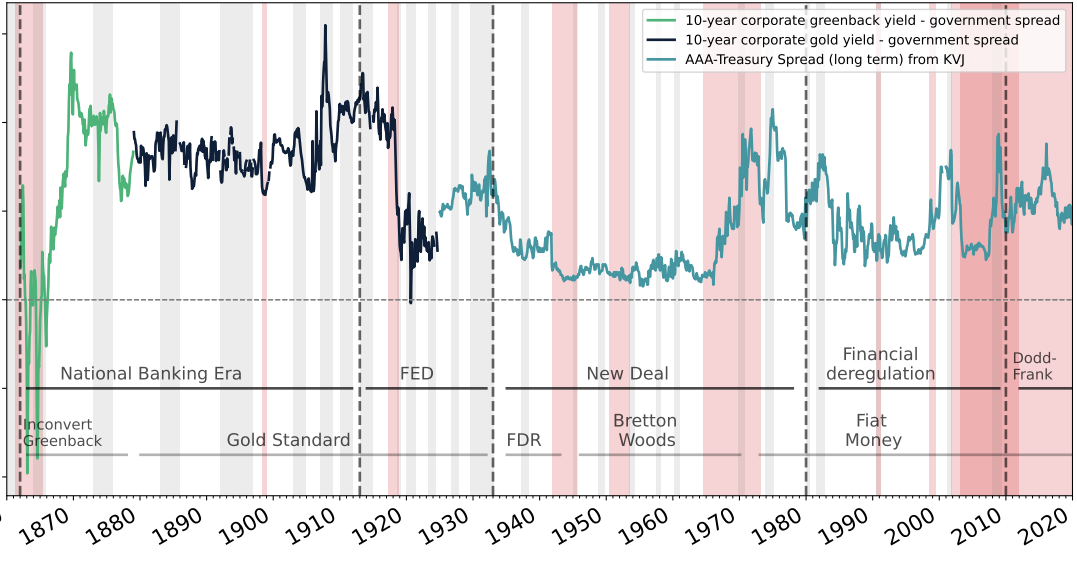
$$\text{Government bond holdings} \geq \kappa^b \text{ Money created}$$

- This introduces a state contingent Lagrange multiplier, μ_{t+1}, into Bank Euler equation for holding LT government bonds with decaying coupon ζ:

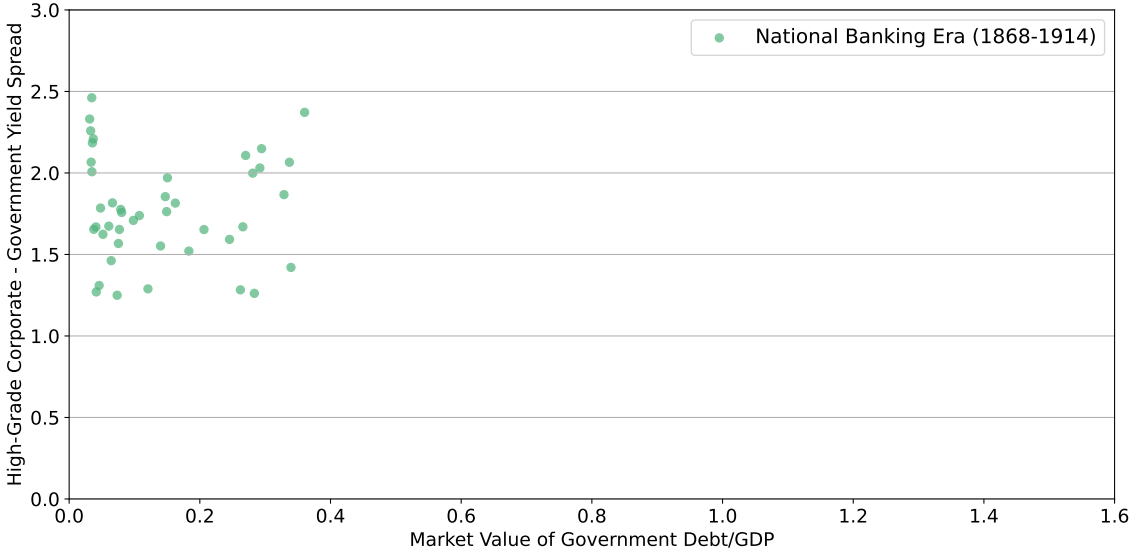
$$\underbrace{q_t^b}_{\text{Bond price}} = \mathbb{E}_t \Bigg[\underbrace{M_{t,t+j}}_{\text{Household SDF}} \underbrace{\left(\frac{1 - \partial_\Delta \Psi_{t+1} + \mu_{t+1}^b}{1 - \partial_\Delta \Psi_t} \right)}_{\substack{\text{distortion from equity issuance} \\ \text{costs and collateral constraint}}} \Big(\underbrace{\zeta + q_{t+1}^b (1 - \zeta)}_{\substack{\text{Coupon repayment} \\ \text{and next period price}}} \Big) \Bigg]$$

- The Lagrange multiplier μ_{t+1}^b is large in negative shocks, so government debt is a good hedge (even without fiscal backing) $\Rightarrow q_t^b$ trades with a convenience premium.

Convenience Yield Opens Up Post Civil War



And Convenience Yield is Not Responsive to Debt-GDP



Conclusion

- Interesting, thought provoking, and very topical paper!
- Important to understand how "exorbitant privilege" moved from UK to US debt in late nineteenth or early twentieth century.
- I am inclined to believe that:
  - UK colonies explain a large amount of the fiscal backing of UK debt,
  - US financial "repression" has acted as a partial substitute for fiscal backing.
- But I don't think either view is incompatible with the analysis in this paper.

Thank you