Discussion of "What next for r*?" by Lukasz Rachel

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Goal of the discussion

- In this discussion I will complement Lukasz's (very nice) paper by providing some empirical evidence
- I will use international data on inflation, short, and long term yields, to estimate r* for several countries and provide a measure of "global" r* using the approach in Del Negro, Giannone, Giannoni, Tambalotti, "Global trends in interest rates," 2019,
  - extending the end of the sample from 2017 to 2024, so we can discuss what happened to r* in the most recent period
  - ... and the cross section of countries from the G7 to all 18 countries in Jordà-Schularick-Taylor Macrohistory database, to have broader international coverage
- I will interpret some of Lukasz's findings in light of this evidence

Estimating trends

- The econometric framework is a VAR with common trends/"trendy VAR" (Del Negro, Giannone, Giannoni, Tambalotti, BPEA 2017)

$$y_t = \Lambda \bar{y}_t + \tilde{y}_t$$

- y_t are $n \times 1$ observables, $\bar{y}_t$ are $q \times 1$ *trends*

$$\bar{y}_t = \bar{y}_{t-1} + e_t$$

- $\tilde{y}_t$ are *stationary components* that follow an unrestricted (stationary) VAR

$$\Phi(L)\tilde{y}_t = \varepsilon_t$$

where ε_t and e_t are orthogonal

$\Rightarrow$ Multivariate trend-cycle decomposition where each trend can affect multiple variables (Λ)

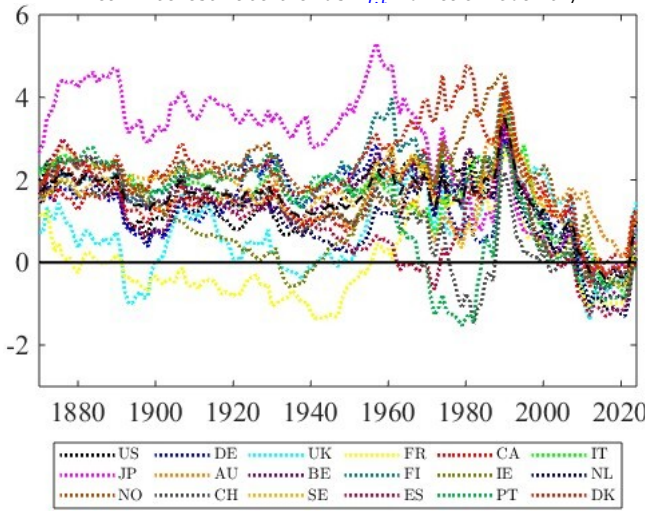
Observables and Trends

observables ($t = 1870, .., 2024,\ i = 1, .., 18$)			trends		stationary comp.
	y_t	$=$	$\Lambda \bar{y}_t$		$+ \tilde{y}_t$
Inflation	$\pi_{i,t}$	$=$	$\underbrace{\lambda_i^{\pi} \overline{\pi}_t^{w} + \overline{\pi}_t^{i}}_{\overline{\pi}_{i,t}}$		...
Short term rates	$R_{i,t}$	$=$	$\overline{\pi}_{i,t} + \overline{r}_{i,t}$		...
Long term rates	$R_{i,t}^{L}$	$=$		$+\overline{ts}_t^{w} + \overline{ts}_t^{i}$	...

- Both $R_{i,t}$ and $R_{i,t}^{L}$ are nominal yields on government bonds. Data is from JST database
- Inflation trends $\overline{\pi}_{i,t}$ (common + country-specific) are identified off inflation and nominal yields
- Trends in real rates $\overline{r}_{i,t}$ are identified as the level factor moving (the permanent component of) both short and long term *real* yields (allowing for trends in the term spread)

Global convergence in r* since the late 1980s

Real interest rate trends $\overline{r}_{i,t}$ for each country



- Trends in real rates are one and the same across advanced countries after the late 1980s
- Both the decline in r* from 1990 to 2020, as well as the post-Covid rise, are **global** phenomena

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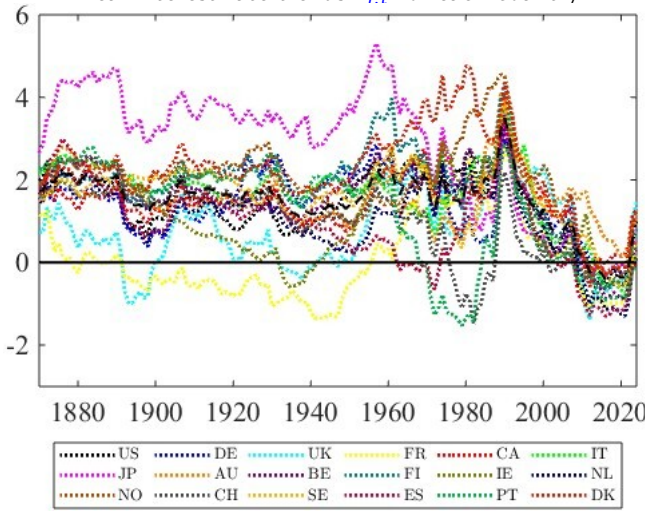

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⇒ Whatever explanations for the decline and recent rise in r* better be global—the paper does the right thing by taking a global perspective

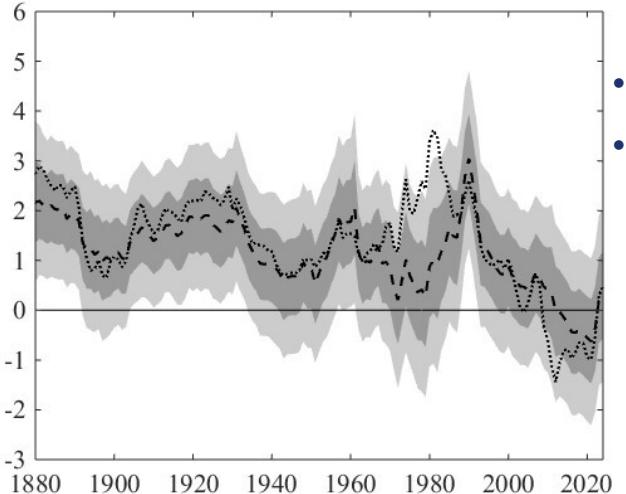
Estimating the world r*

observables ($t = 1870, .., 2024,\ i = 1, .., 18$)			trends		stationary comp.
	y_t	$=$	$\Lambda \bar{y}_t$		$+ \tilde{y}_t$
Inflation	$\pi_{i,t}$	$=$	$\underbrace{\lambda_i^{\pi} \bar{\pi}_t^w + \bar{\pi}_t^i}_{\bar{\pi}_{i,t}}$		...
Short term rates	$R_{i,t}$	$=$	$\bar{\pi}_{i,t} + \underbrace{\bar{r}_t^w - \overline{cy}_t^i}_{\bar{r}_{i,t}}$		...
Long term rates	$R_{i,t}^L$	$=$		$+\overline{ts}_t^w + \overline{ts}_t^i$	...

- Global trend in real rates $\bar{r}_t^w$ is estimated as the common trend among the $\bar{r}_{i,t}$'s. Under financial markets integration, $\bar{r}_t^w$ can be interpreted as the trend in the *"world" real interest rate*.
- The idiosyncratic trends $-\overline{cy}_t^i = \bar{r}_{i,t} - \bar{r}_t^w$ can be interpreted as country-specific *convenience yields*

The decline, and recent rise, in the world r*

$\bar{r}_t^w$ (dashed, with bands) and $\bar{r}_{US,t}$ (dotted)



- Global r* fell from about 3 percent in the late 80s to below 0 right before Covid, and rose by about 1 percent after Covid ($\bar{r}^w_{2024}$= 0.31)
- ... with US r* in tow ($\bar{r}^{US}_{2024}$= 0.46)
- The size of the *pre-Covid* decline is in the ballpark of what reported in the paper

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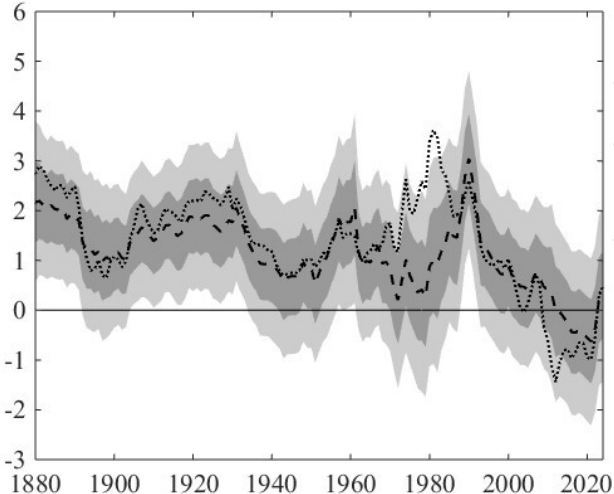

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- The size of the *pre-Covid* decline is in the ballpark of what reported in the paper
- What drives the post-Covid rise in r*? It better be
  1. global (purely country-specific explanations—eg, US debt less palatable, etc—may not be so important)
  2. sudden (what news?)

Drivers of $\overline{r}_t^w$: Identifying the convenience yield component

observables ($t = 1870, .., 2024,\ i = 1, .., 18$)			trends	stationary comp.
Inflation	$\pi_{i,t}$	$=$	$\underbrace{\lambda_i^{\pi}\overline{\pi}_t^w + \overline{\pi}_t^i}_{\bar{\pi}_{i,t}}$	...
Short term rates	$R_{i,t}$	$=$	$\bar{\pi}_{i,t} + \underbrace{\underbrace{\overline{m}_t^w - \overline{cy}_t^w}_{\overline{r}_t^w} - \overline{cy}_t^i}_{\overline{r}_{t,i}} + \overline{ts}_t^w + \overline{ts}_t^i$	...
Long term rates	$R_{i,t}^L$	$=$		...
Baa corporate yield	$R_{US,t}^{Baa}$	$=$	$\bar{\pi}_{i,t} + \overline{m}_t^w$	

- We use the US Baa corporate yield to identify the convenience yield (Krishnamurthy Vissing-Jorgensen, 2012):
  (trend in) $R_{US,t}^{Baa} - R_{US,t}^{L} = \overline{cy}_t^w + \overline{cy}_t^{US}$
- since $\overline{cy}_t^{US}$ is already identified from $\overline{r}_{US,t} - \overline{r}_t^w \rightarrow$ we can extract $\overline{cy}_t^w$

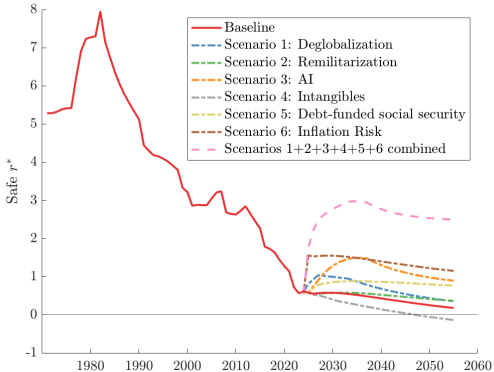
$\bar{r}_t^w$, $\bar{r}_t^{US}$ and their drivers

	$\bar{\mathbf{r}}_\mathbf{t}^\mathbf{w}$		$\bar{\mathbf{r}}_\mathbf{t}^\mathbf{US}$	
	1990-2020	**2020-2024**	**1990-2020**	**2020-2024**
Baseline Model				
$\bar{r}_t$	-3.60^{***}	0.87^{***}	-3.56^{***}	1.40^{***}
	$(-5.03, -2.18)$	$(0.19, 1.55)$	$(-5.42, -1.65)$	$(0.51, 2.31)$
Convenience Yield Model				
$\bar{r}_t$	-3.88^{***}	1.06^{***}	-3.25^{***}	1.28^{***}
	$(-5.47, -2.31)$	$(0.37, 1.73)$	$(-4.60, -1.88)$	$(0.58, 1.99)$
$-\overline{cy}_t$	-1.57^{***}	0.34	-0.92^{***}	0.57^{**}
	$(-2.62, -0.48)$	$(-0.16, 0.83)$	$(-1.66, -0.19)$	$(0.04, 1.10)$
$\bar{m}_t$	-2.32^{***}	0.71^{***}	-2.32^{***}	0.71^{***}
	$(-3.62, -1.03)$	$(0.17, 1.27)$	$(-3.62, -1.03)$	$(0.17, 1.27)$

What *global* news drove the post-Covid rise in r*?

- ... other than the convenience yield. Two natural candidates are news about
  1. AI
  2. ⇑ Debt/GDP: Unwillingness to raise taxes to deal with demographics transition in advanced economies + military spending

  while both are potentially global, it is hard for either to generate a sudden increase in r* *in Lukasz's model*



Conclusions

- Very timely, interesting, and comprehensive paper on the factors driving the decline, and the possible future rise, in global r*
- Quantitative analysis broadly in line with the empirical evidence

Thank you!