Natural and Neutral Real Interest Rates: Past and Future

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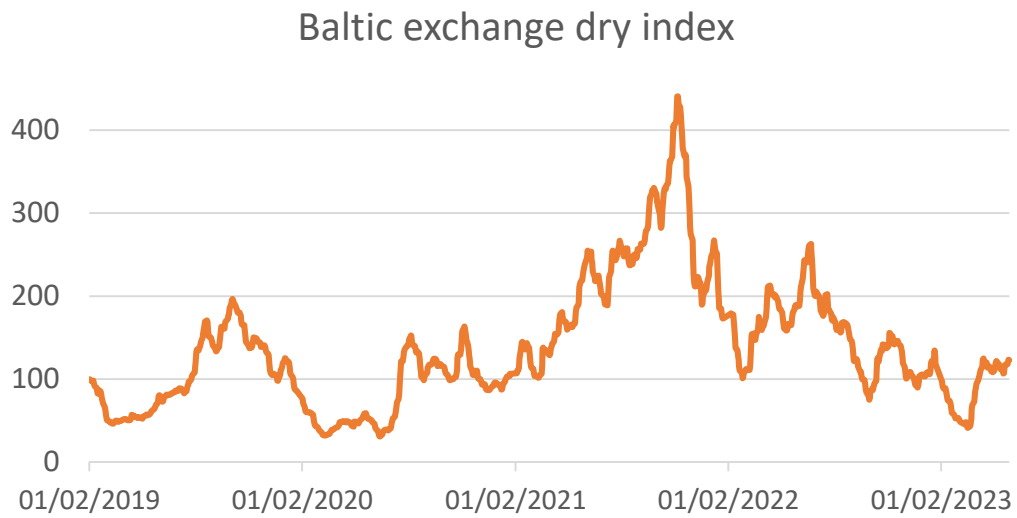
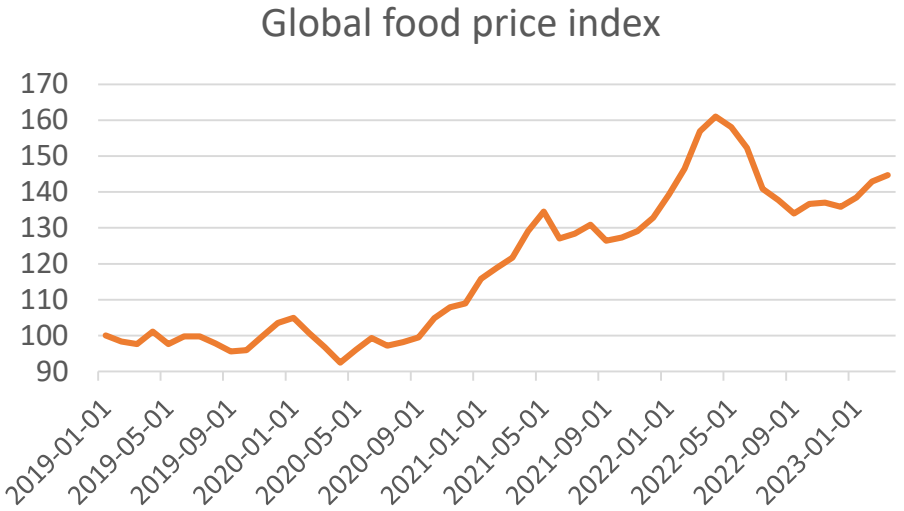
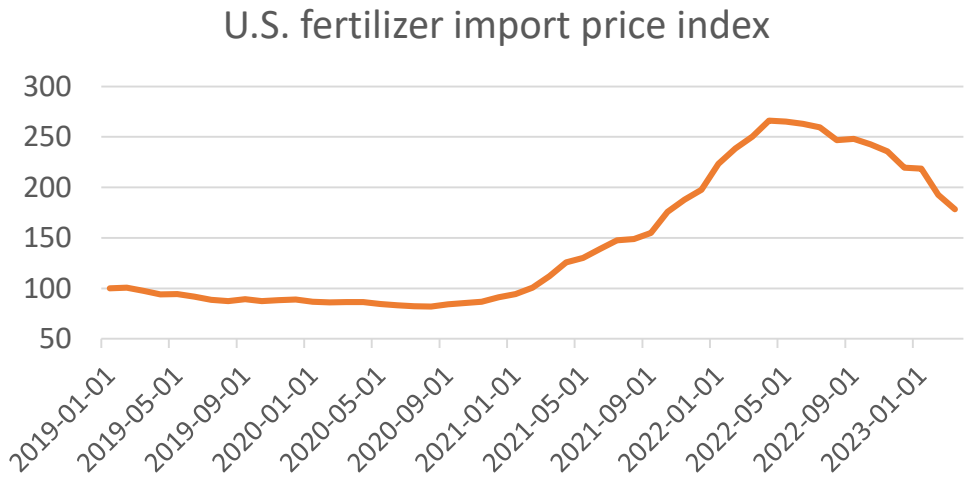
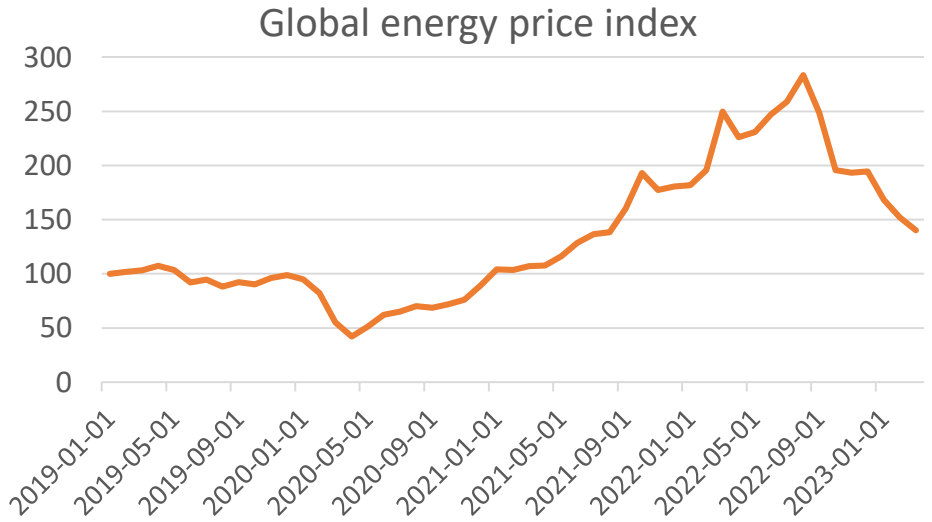
After years of “secular stagnation” pressures, serial price shocks helped inflation to surge

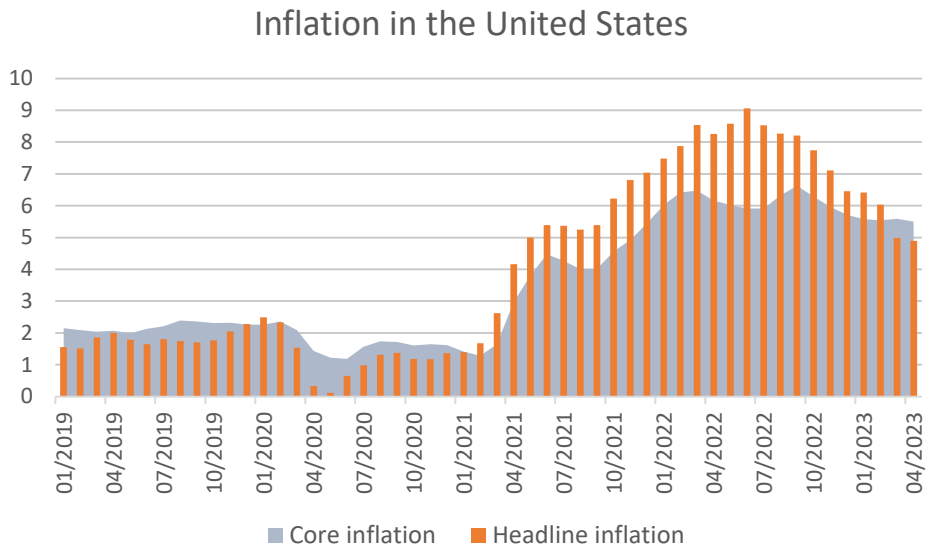


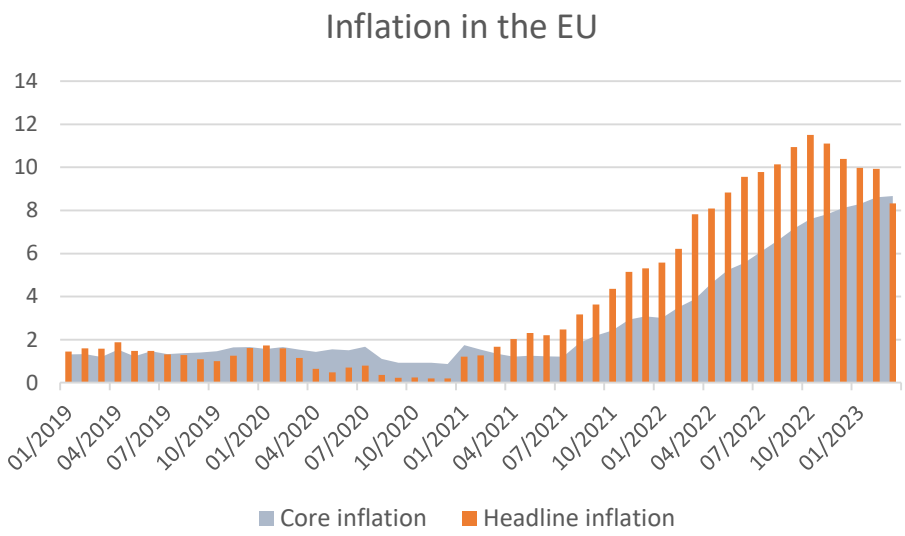


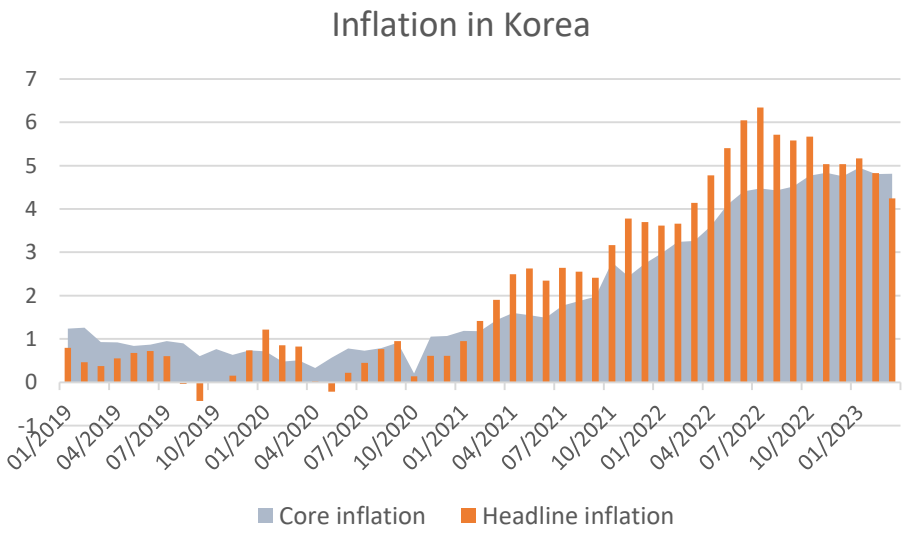


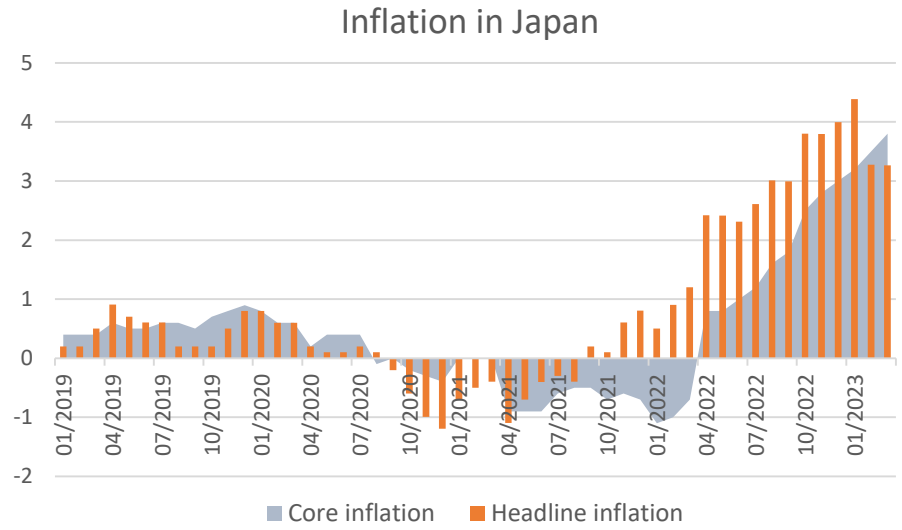


Driven by fiscal policies, economic reopening, and war, price pressures became widely entrenched





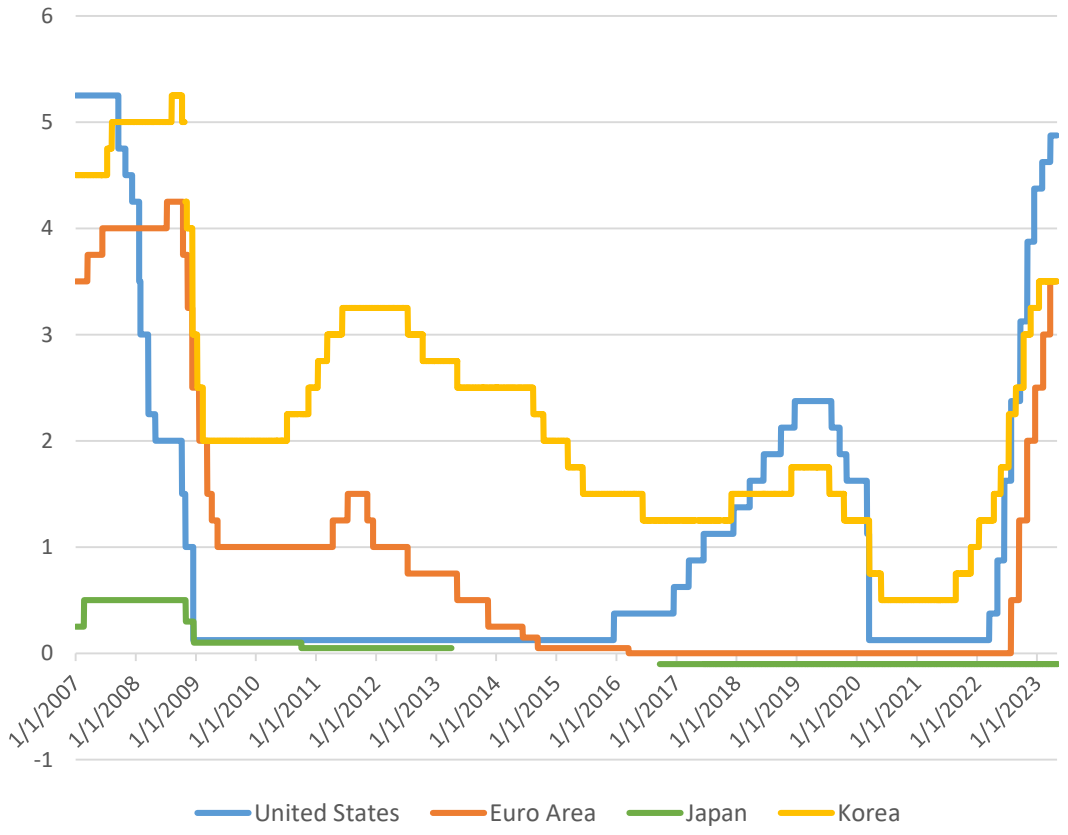




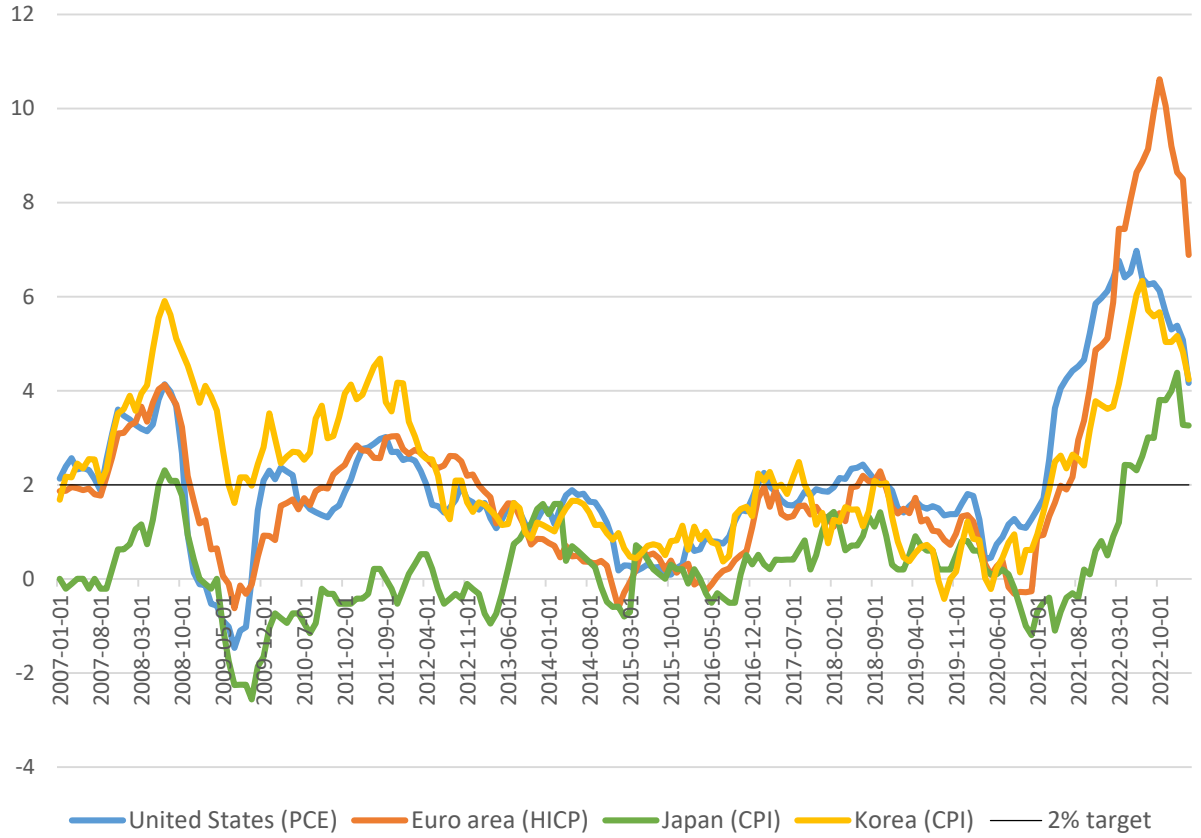
Source: Year-over-year CPI inflation from CEIC

For years, central banks had fought to make policy rates low enough; in 2021-22 were they too low?

Policy interest rates, 2007-2023



Inflation rates, 2007-2023



Monetary economists and (these days) central bankers refer to the “natural” or “neutral” rate

- This is the “goldilocks” rate – at this rate, the economy is neither too hot nor too cold.
- Goes back to Thornton (1802) and Wicksell (1898) – highlighted by Woodford (2002).
- But how can we measure it? Many approaches, measuring different things – theme of Ricardo Reis’s AMPF paper last year.
- And to predict future rates, we need to understand the driving forces.

John H. Williams put it well nine decades ago

John Henry Williams, 1887-1980

"The natural rate is an abstraction; like faith, it is seen by its works. One can only say that if the bank policy succeeds in stabilizing prices, the bank rate must have been brought in line with the natural rate, but if it does not, it must not have been."

From "The Monetary Doctrines of J. M. Keynes," *Quarterly Journal of Economics,* August 1931, quoted by Athanasios Orphanides and John Carroll Williams, *Brookings Papers,* 2002.

Empirical approaches to assessing what the correct rate "must have been" are varied

1. Estimating long-run forecasts or trends by nonstructural time series methods.
2. Extracting information on the expected long-run real interest rate from a term structure model.
3. Solving for the flexible-price equilibrium, rate within a calibrated structural dynamic model.
4. Semi-structural (famously, Laubach and Williams 2003, and many variants).

Measuring $\bar{r}$ versus r^*

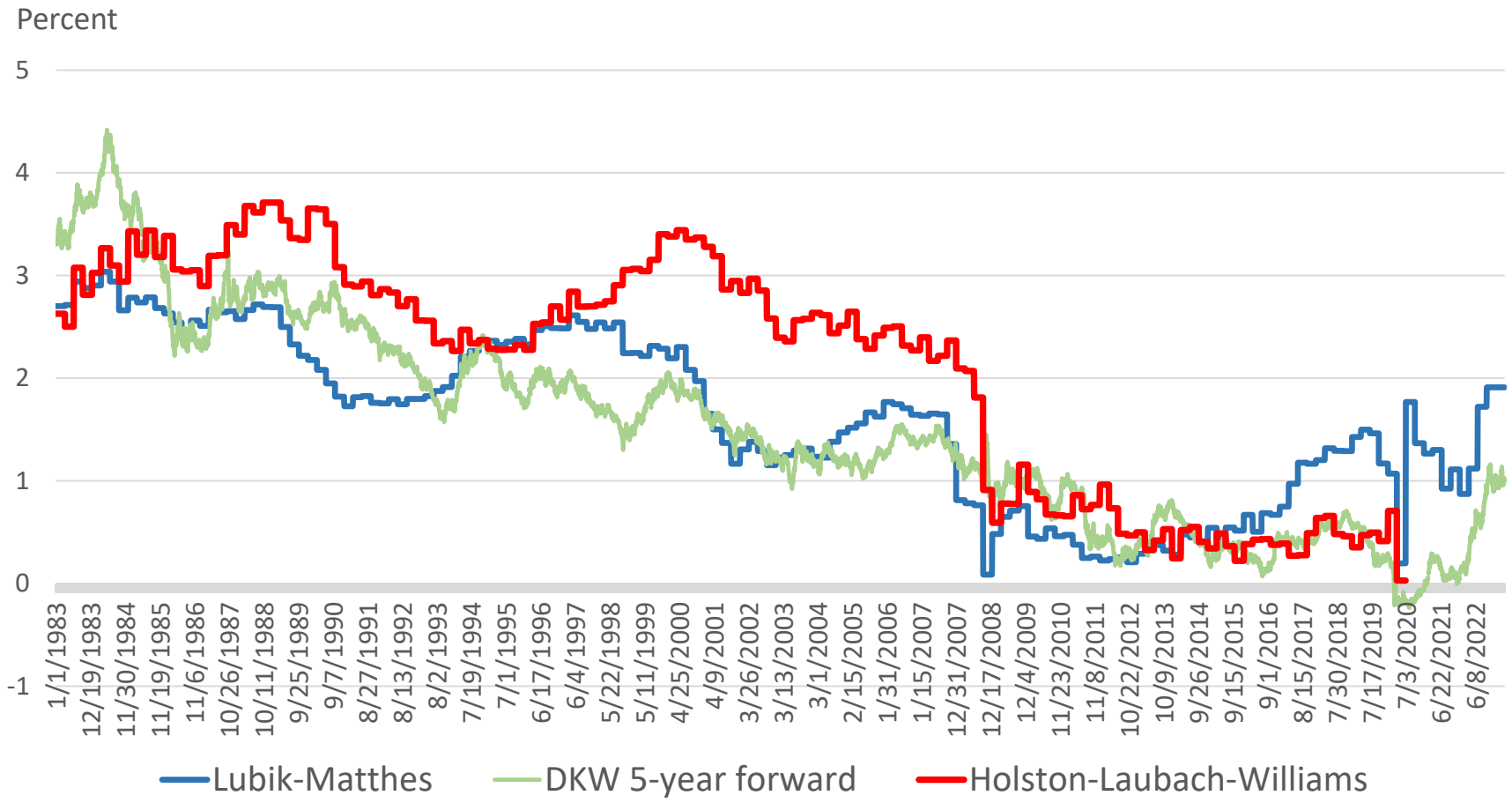
- Approaches #1 – 3 measure a hypothetical long-run equilibrium real rate – $\bar{r}$ (r-bar).

- Only #4 directly and empirically addresses inflation control.

- In some theoretical models, $\bar{r}$ is the right benchmark rate for the central bank to control inflation: in that case, $\bar{r} = r^*$(r-star)

- But what about reality? For several reasons, $\bar{r}$ might not equal r^*.

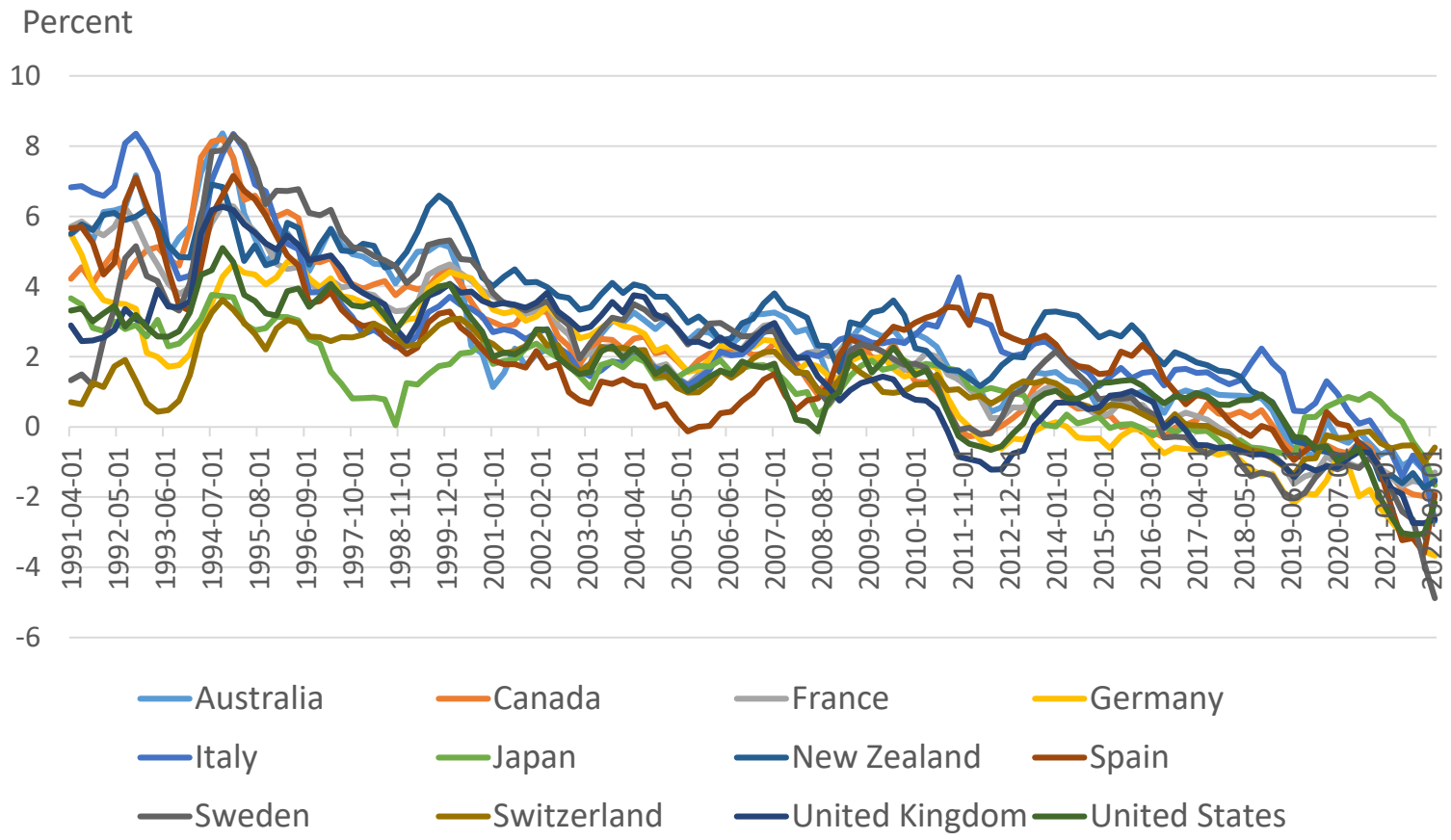
Long-run trends show broadly declining rates, but different approaches disagree non-trivially



Why might $\bar{r}$ differ from r^*?

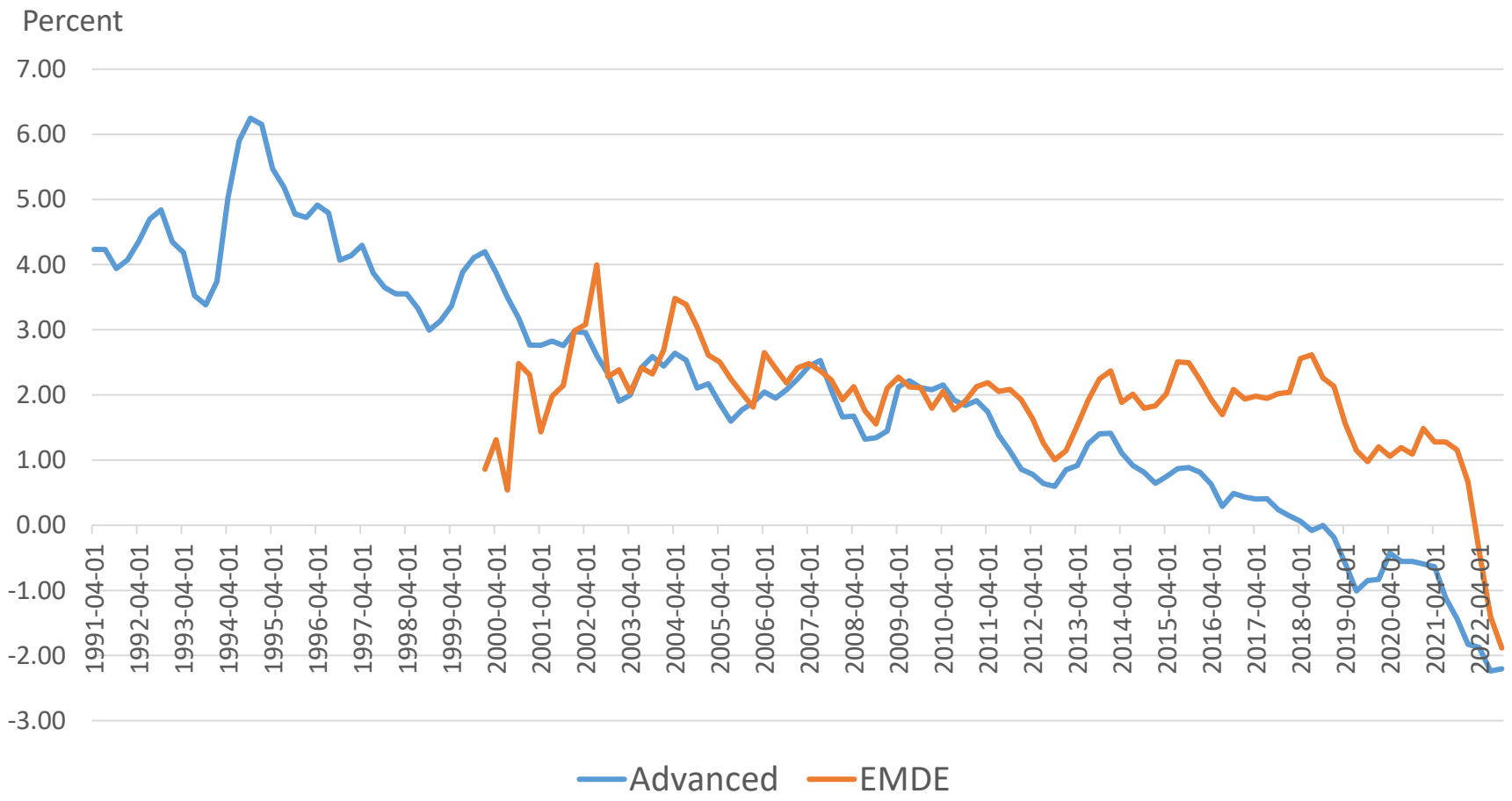
- Financial conditions, including international capital-account shocks.
- Imperfect credibility – what is part of the bank's job is signaling?
- Most empirical analogs of r-bar and r-star do not adequately account for open-economy factors. These can drive a wedge between the short-run inflation stabilizing rate and the long-run real interest rate.
- Global factors have been all-important in determining real rates.

The smoking gun evidence on the primacy of global factors is *synchronized* decline in rates

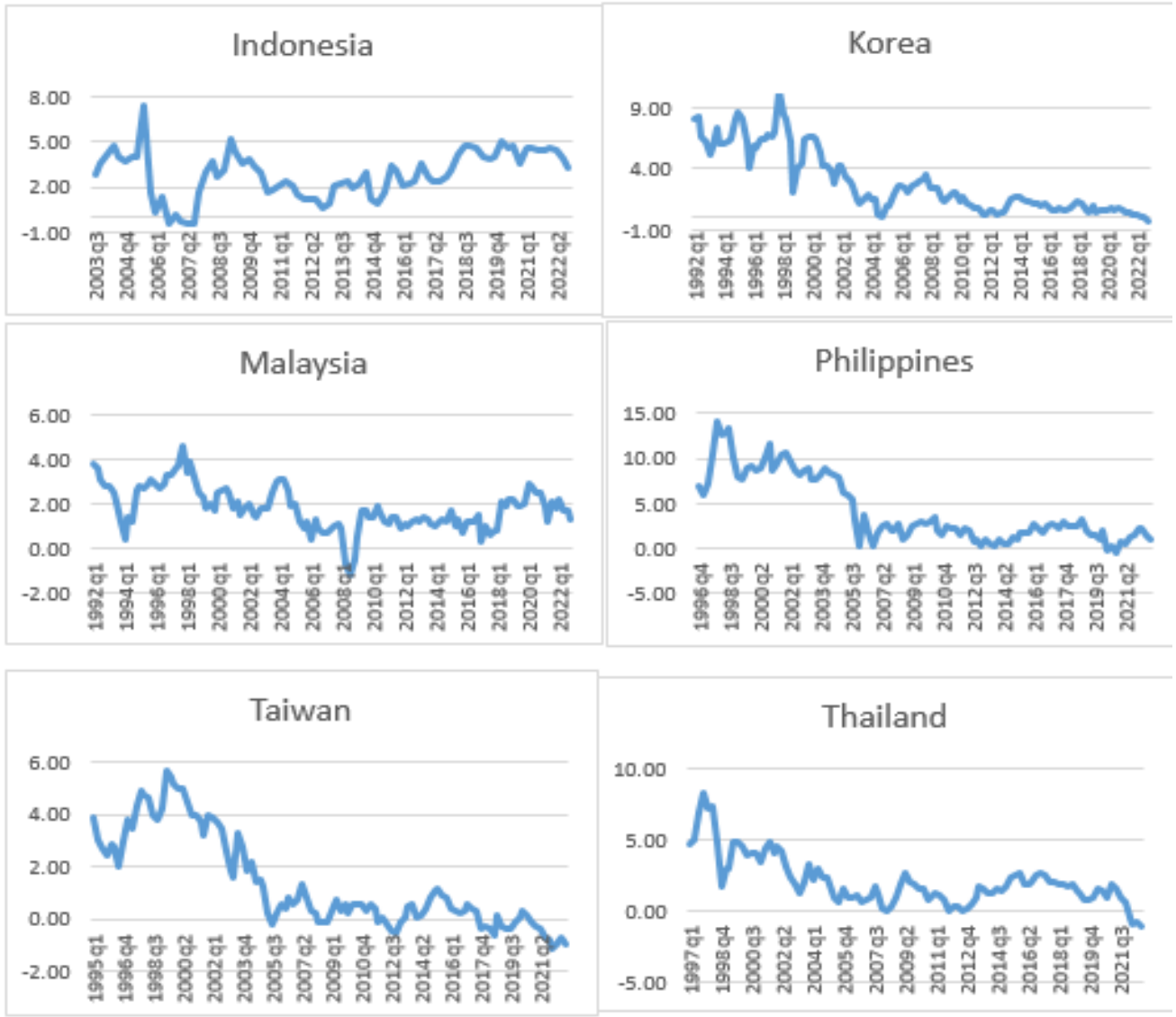


Note: Semi ex post real rates on 10-year government bonds

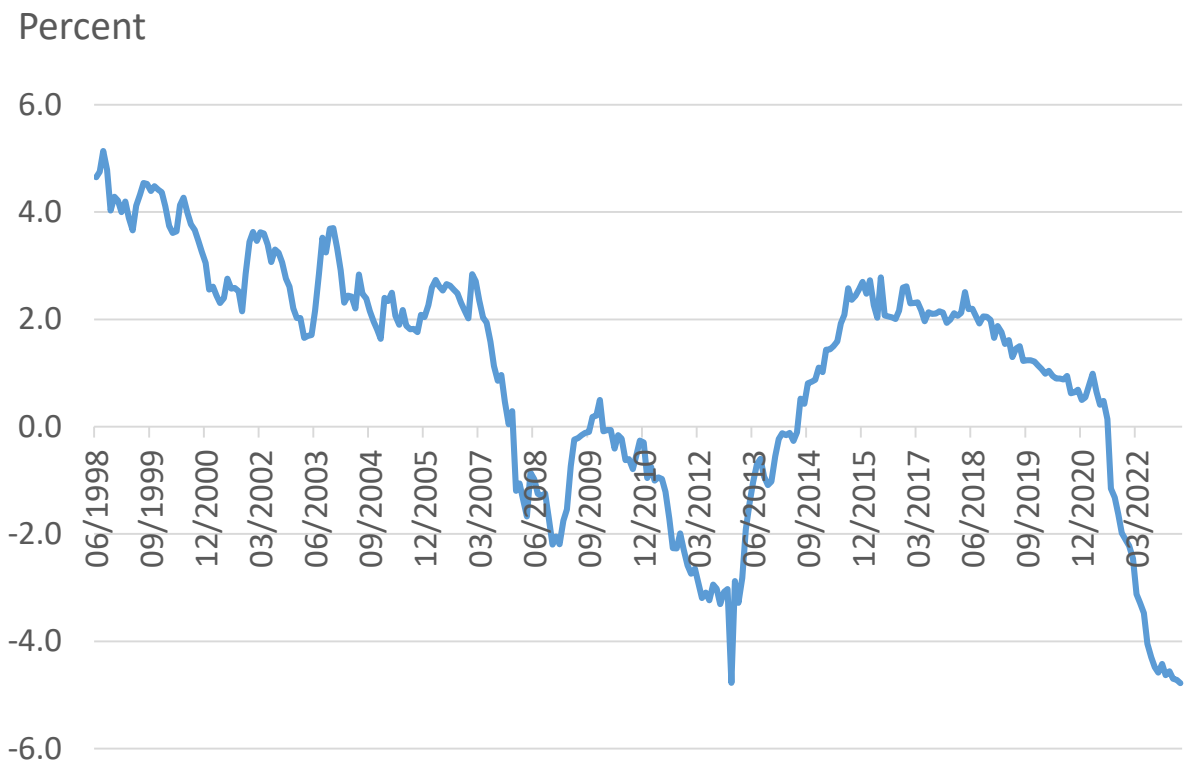
Similarly for EMDEs – but less so since the GFC, possibly evidence of financial barriers



Some East Asian long-term real rates

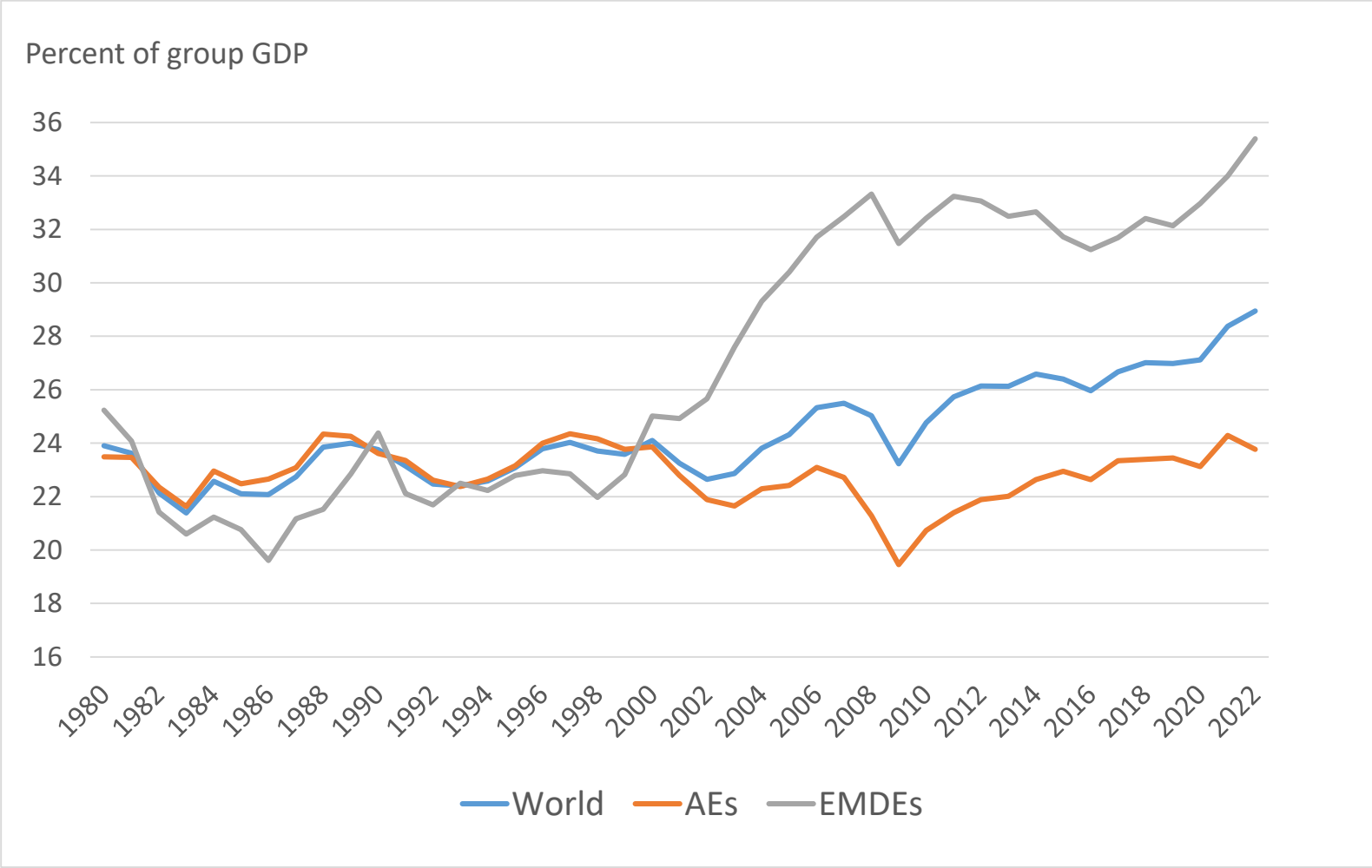


Long-term real rates of Singapore

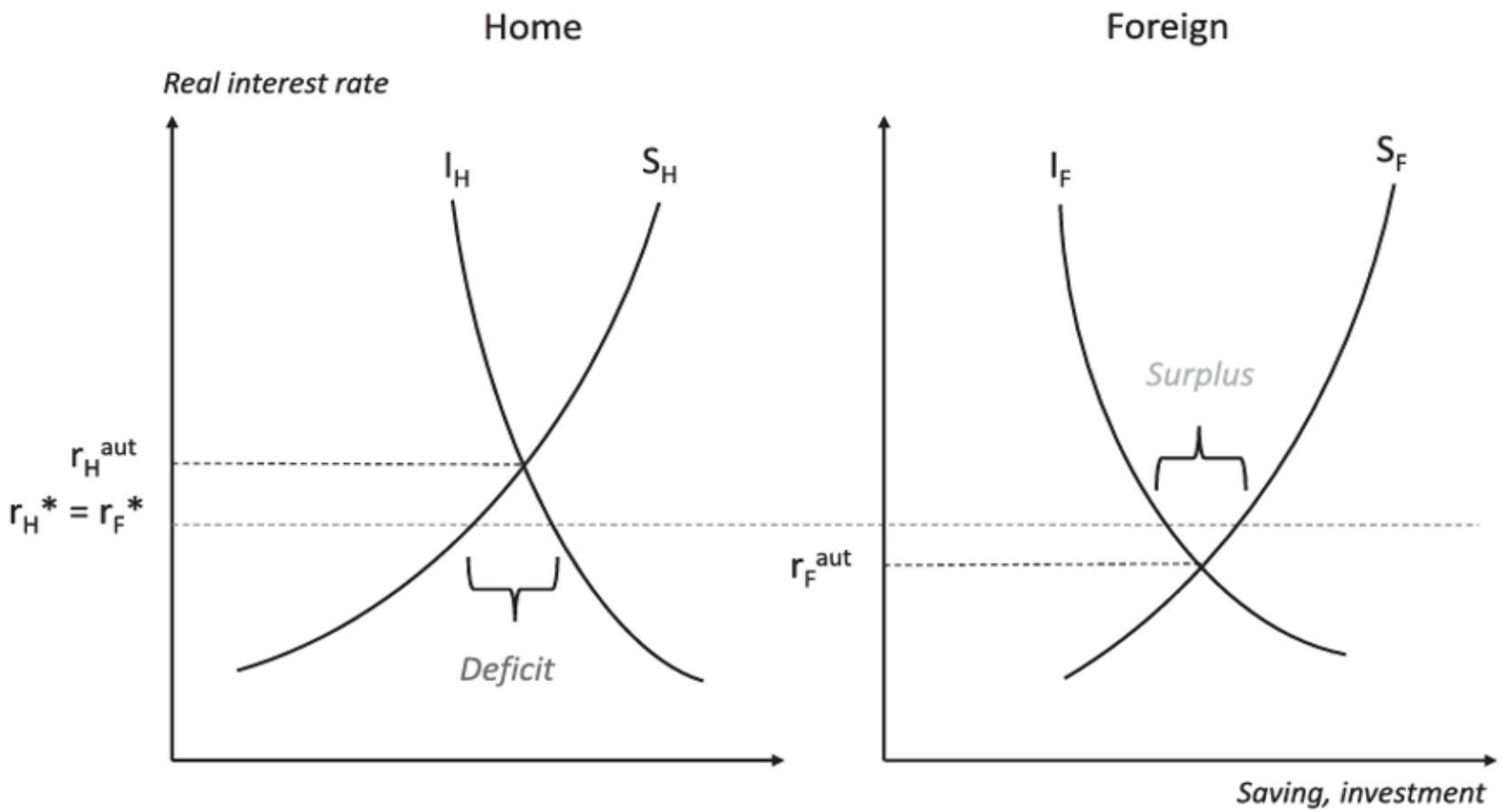


Source: CEIC

EMDEs' saving (and investment) must be key to the story, especially given their growth in the 2000s



A basic analytical frame comes from Metzler

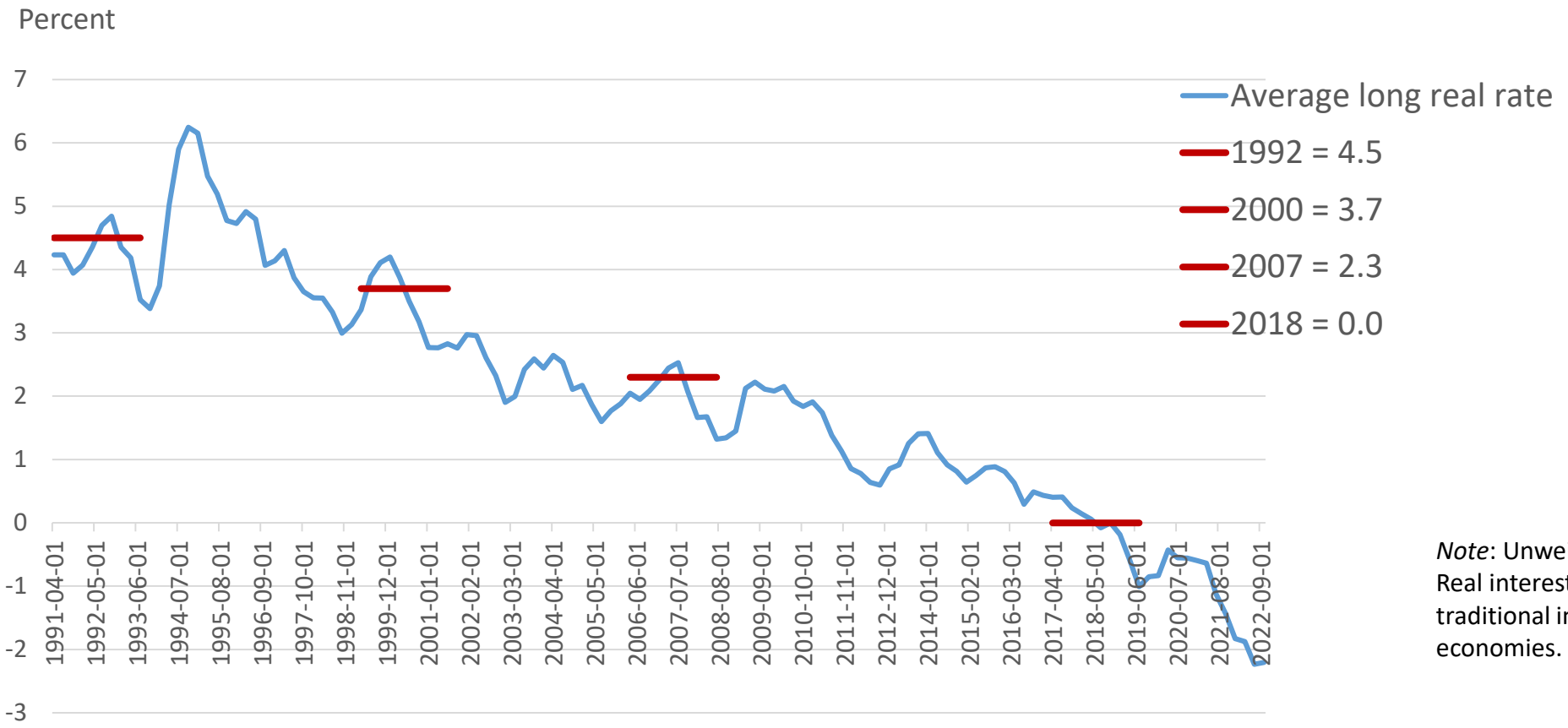


Implications and limitations

- Factors that raise global saving, in whatever country they originate, depress equilibrium global real interest rates.
- Factors that reduce global investment, in whatever country they originate, depress equilibrium global real interest rates.
- But this is not the entire story –the specific assets in which savers wish to invest matter, too.
- In cases of preference shifts, returns on different assets could diverge.

What factors drove world interest rates down?

Three possible epochs up to COVID-19 (following Caballero, Farhi, and Gourinchas 2017):

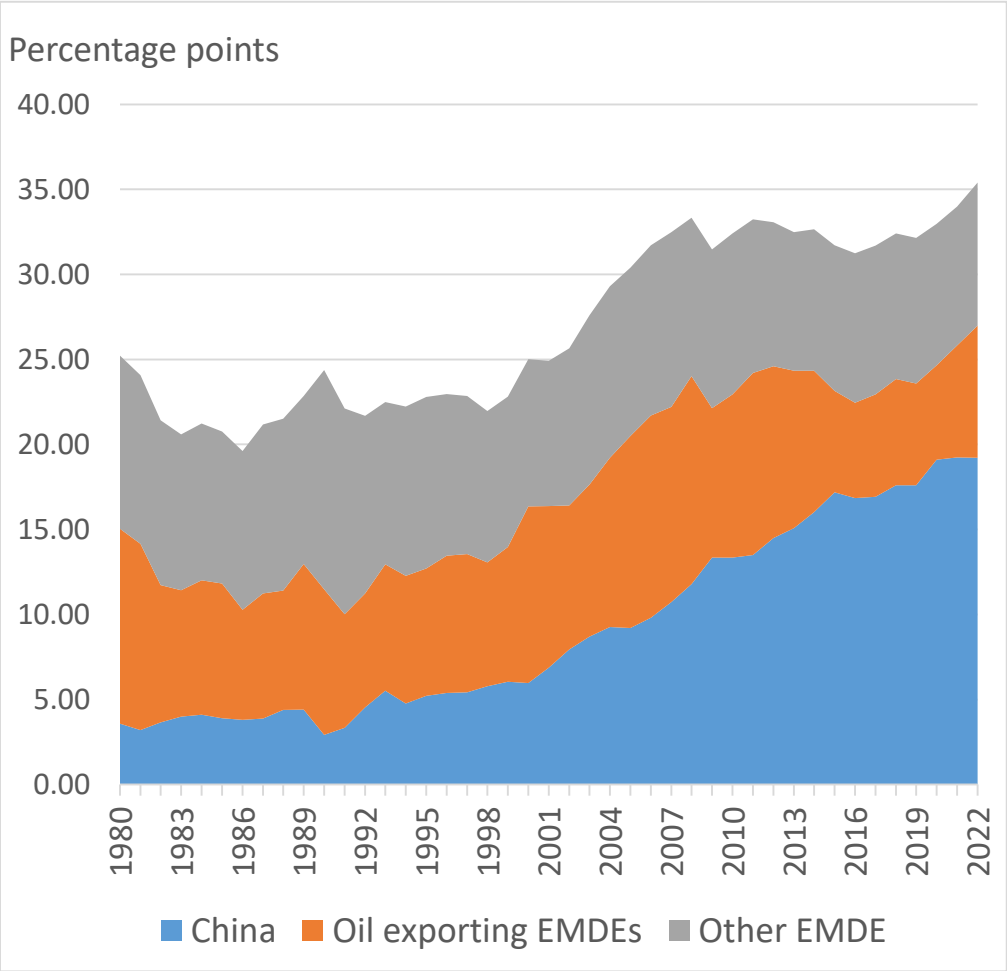


Note: Unweighted average Real interest rate of 12 traditional industrial economies.

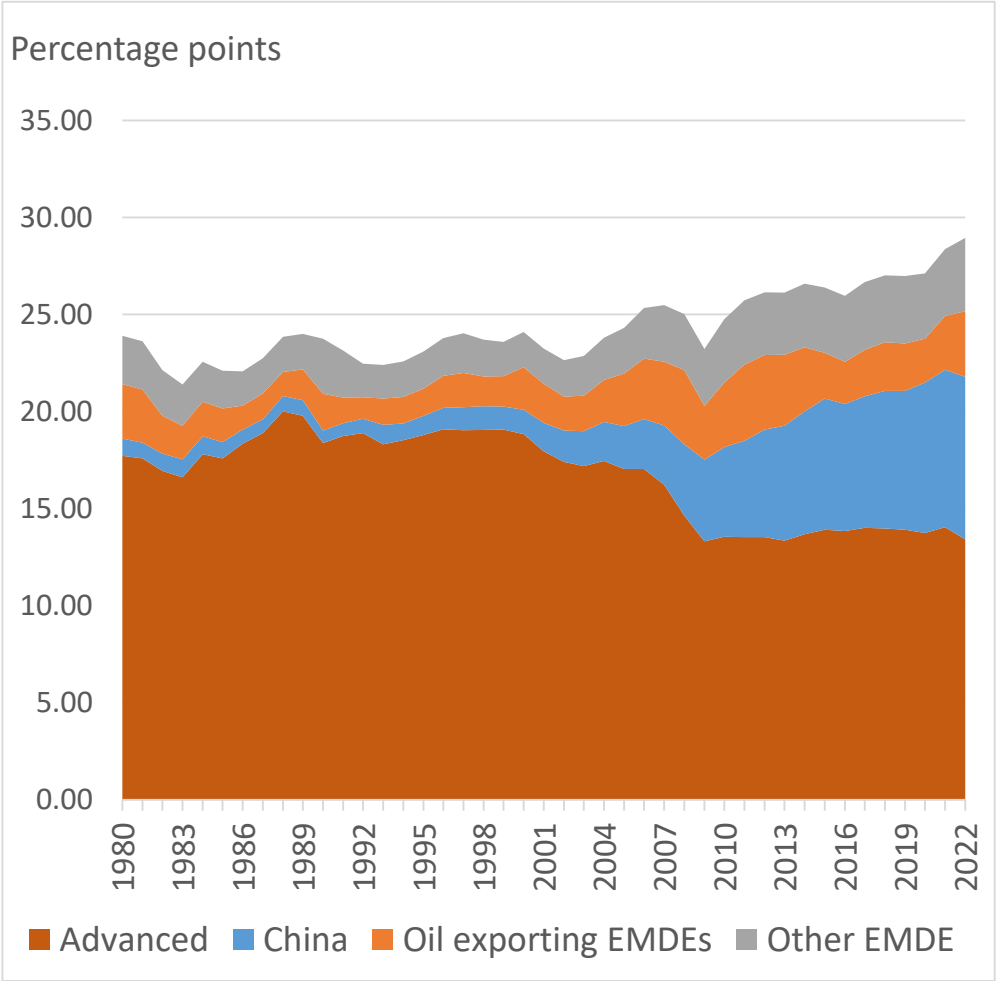
Different factors dominated different epochs

- 1990s to Asian crisis
  - ➢ Demographics – peak of baby boomer work careers (saving ↑); growing inequality (saving ↑); falling price of capital goods (investment ↓); growing corporate market power (investment ↓ and saving ↑).
- Asia crisis to GFC: Global saving (Bernanke) and/or liquidity (Shin) glut?
  - ➢ Easy global liquidity in deregulated markets; high Chinese growth and energy prices; official FX reserve accumulation (a portfolio decision).
- GFC to the COVID-10 crisis
  - ➢ Reserve accumulation abates but private safe asset demand rises in a turbulent environment with low output growth and low productivity growth. Investment falls further but saving likely rises more; workforces age. Euro crisis. Regulation?

A closer look at the 2000s: China's saving

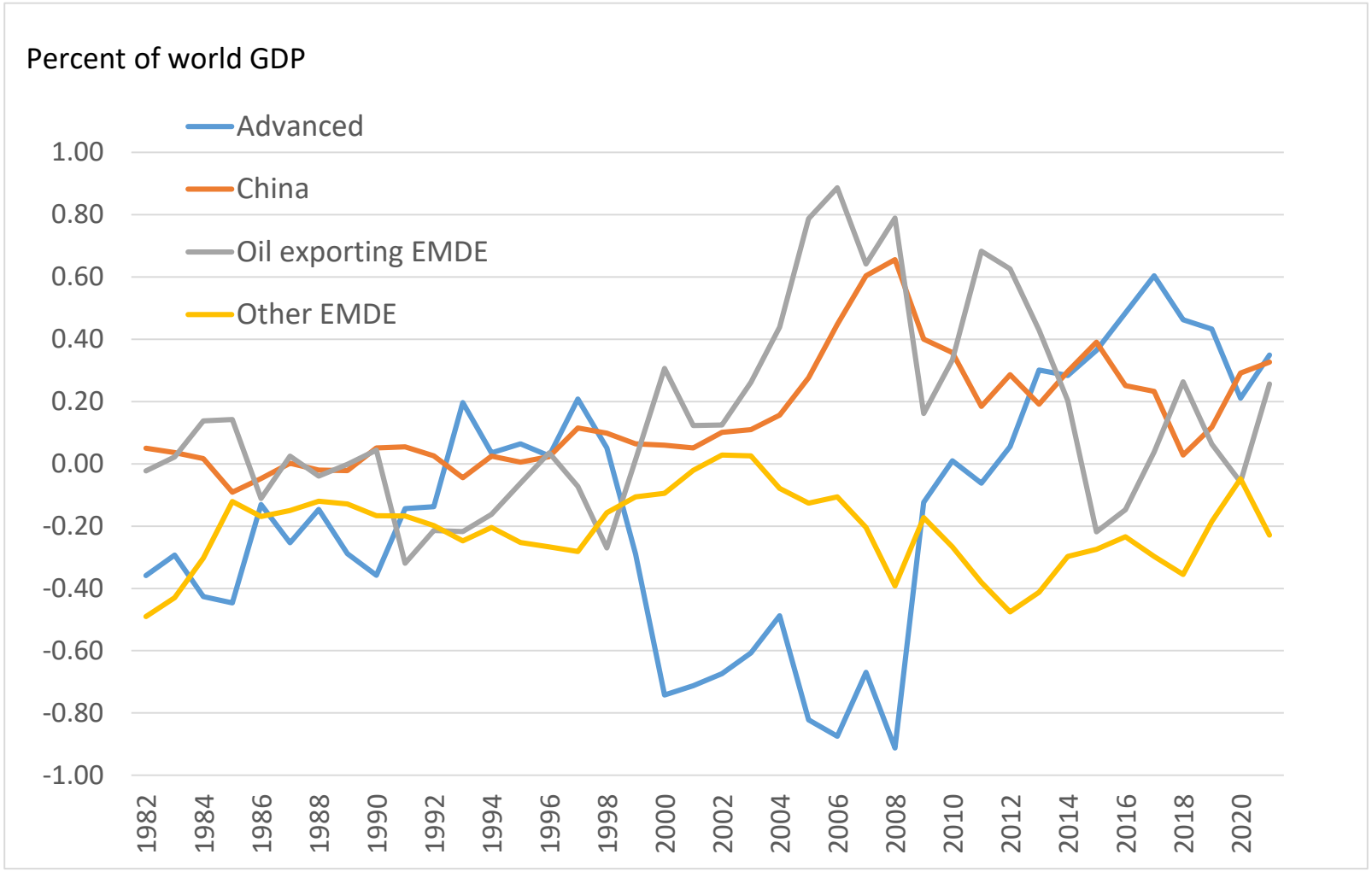


Components of EMDE saving rate

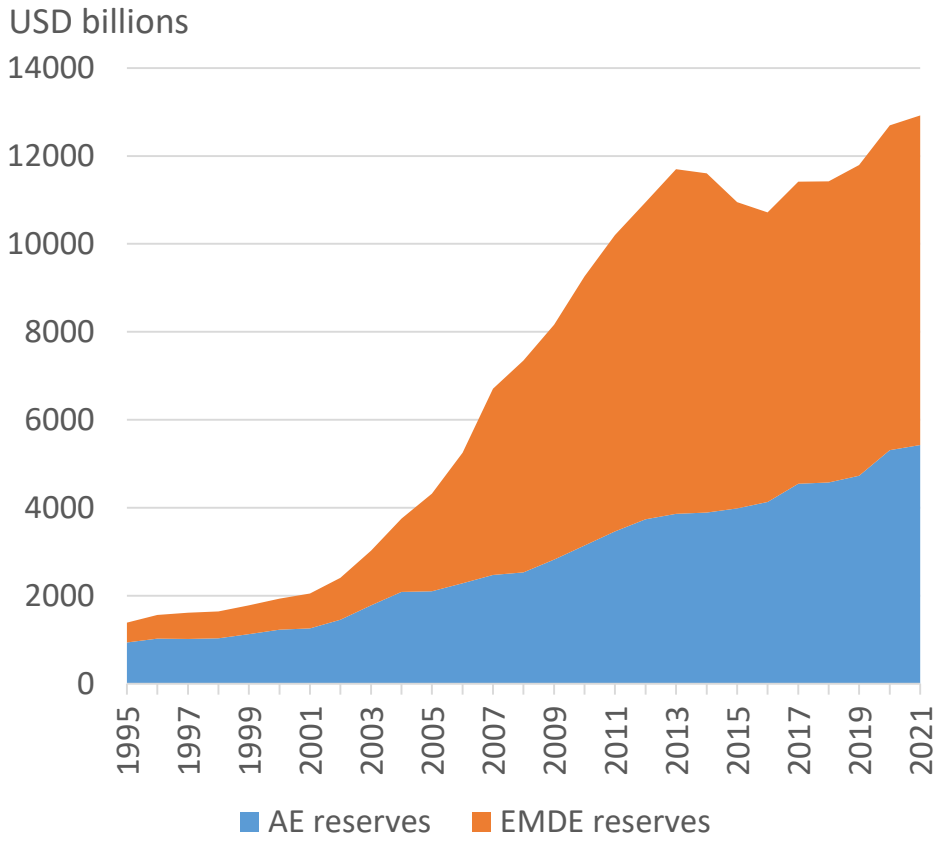


Components of global saving rate

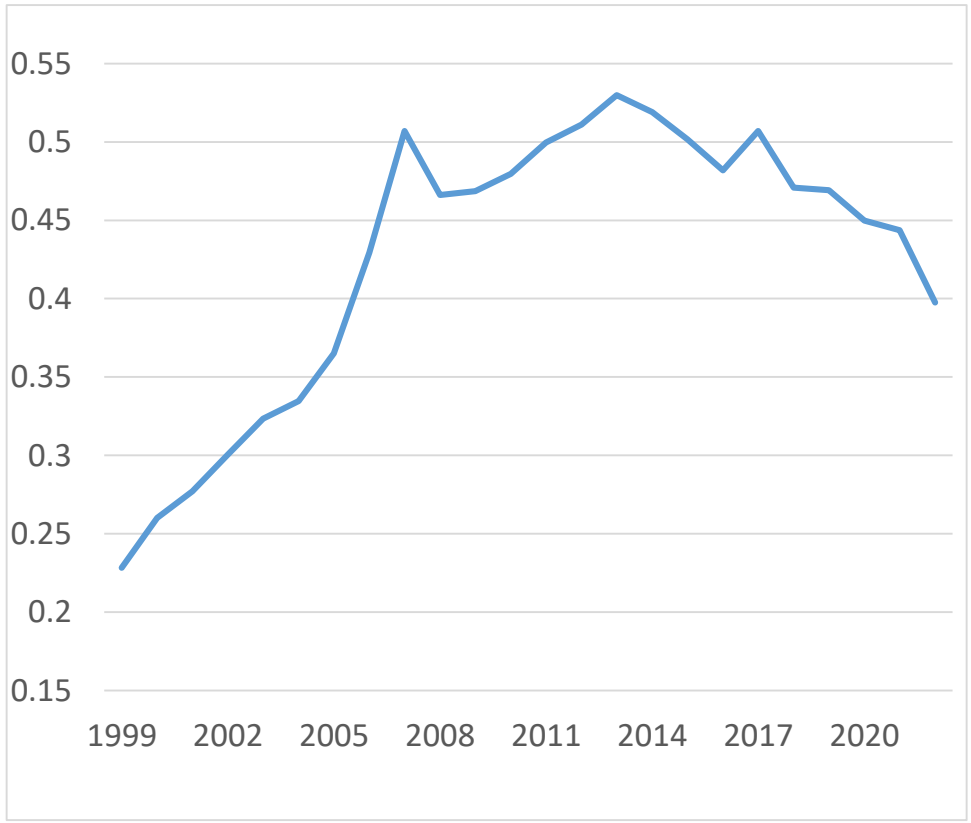
A closer look at the 2000s: Global imbalances



A closer look at the 2000s: Global FX reserves



Foreign exchange reserve stocks of advanced and EMDE countries, 1995-2021



Foreign exchange reserves as a fraction of global safe assets, 1999-2022

Implications for Bernanke's GSG theory

- The rise in global saving and reserve purchases does not really take off until a couple of years (at best) before Bernanke's 2005 speech.
- But the deterioration in the US current account starts way before.
- I have argued that US demand and financial conditions contributed importantly to global imbalances (Obstfeld and Rogoff 2010).
- Theoretically, this would have raised US r^*, even if not US $\bar{r}$.
- Consistent with modeling of Fererro, Gertler, and Svensson (2009).
- Consistent with retrospective HLW estimates (recall chart above).McK

$r^*, \bar{r}$ and the current account: Some theory

- A small open economy produces/consumes traded and nontraded goods and faces a world interest rate *r* (in terms of traded goods).
- A representative consumer maximizes $\sum_{t=0}^{\infty} \beta^t u(C_t)$, with the consumption index:

$$C = \left[\gamma^{\frac{1}{\theta}} C_T^{\frac{\theta-1}{\theta}} + (1-\gamma)^{\frac{1}{\theta}} C_N^{\frac{\theta-1}{\theta}}\right]^{\frac{\theta}{\theta-1}}$$

- Real interest rate is $r_t^C = \left[\frac{(1+r)}{P_{t+1}/P_t}\right]$, where $P = \left[\gamma + (1-\gamma)p^{1-\theta}\right]^{\frac{1}{1-\theta}}$,

$$p_t = \left[\frac{(1-\gamma)\left(C_{T,t}\right)}{\gamma C_{N,t}}\right]^{\frac{1}{\theta}} = \left[\frac{(1-\gamma)\left(Y_{T,t} - NX_t\right)}{\gamma Y_{N,t}}\right]^{\frac{1}{\theta}}$$

$r^*, \bar{r}$ and the current account: Some theory (2)

- In a two-period context where $NX_t + \frac{NX_{t+1}}{1+r} = 0$, we must have

$$p_{t+1} = \left[\frac{(1-\gamma)\left(Y_{T,t+1} + (1+r)NX_t\right)}{\gamma Y_{N,t+1}}\right]^{\frac{1}{\theta}}$$

- So: bigger deficit today ($NX < 0$) → expected deflation → high r^*.
- In this simple model, deficits are demand-driven.
- But in more complex models, world demand is not infinitely elastic.
- Also, there are financial account shocks (Corsetti et al., Kalemli-Özcan)
- In those settings, capital inflows could imply lower r^*.
- But long-term international adjustment process suggests $r^* \neq \bar{r}$.

One lesson: External balance matters

- Definitions and empirical counterparts of r^* focus on internal balance.
- The classic policy frameworks for open economies focus on external as well as internal balance.
- Because output can be imported or exported!
- Equilibrium requires not only the right policy setting for the policy real interest rate, but also exchange rate, long-term interest rates, etc.

Post-COVID debate over the future of real rates

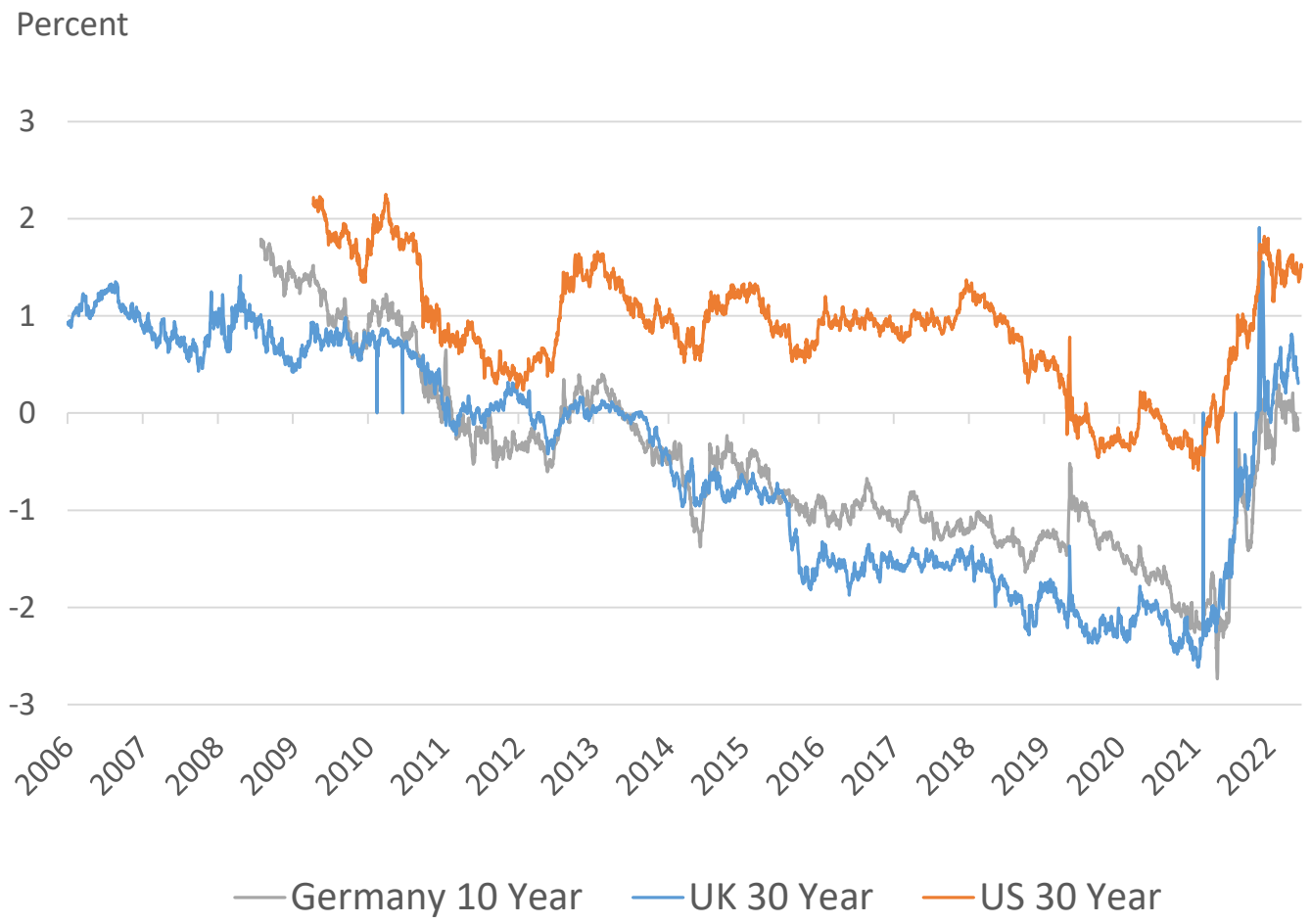
- Is “secular stagnation” over?
- There is lively debate.
- Pre-COVID-19: extensive book by Goodhart and Pradhan (2020)
- See the Peterson Institute disputation between Summers and Blanchard, https://www.piie.com/events/summers-and-blanchard-debate-future-interest-rates

Higher real rates have been predicted before

"[T]he long-term trends in global saving and investment that contributed to low rates in the past will reverse in the decades ahead .... We project that by 2020, global investment demand could reach levels not seen since the postwar rebuilding of Europe and Japan and the era of high growth in mature economies."

McKinsey Global Institute
(December 2010)

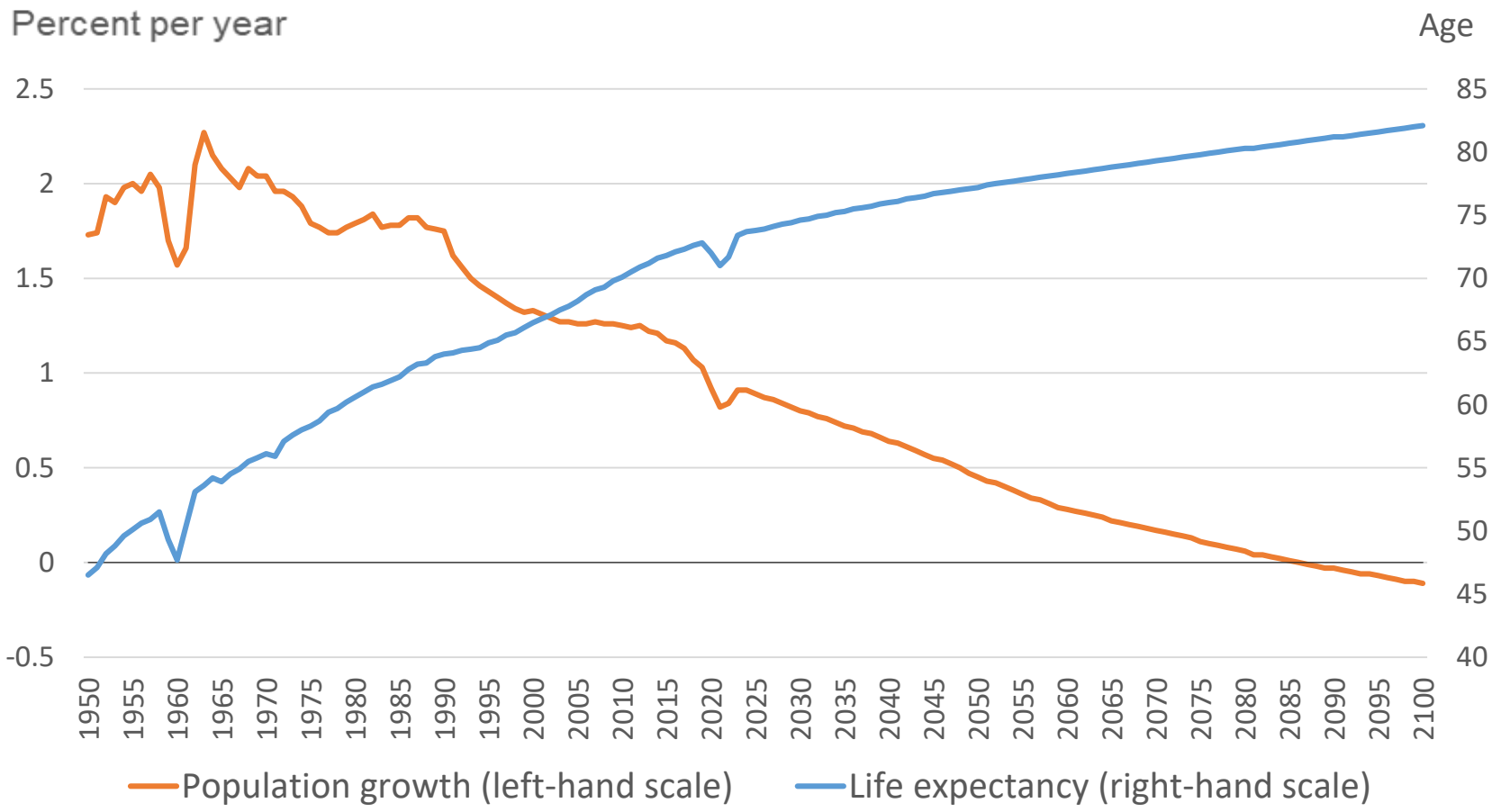
Inflation-protected bond markets seem to agree



Many factors in play

- Pre-COVID, pre-Ukraine Goodhart and Pradhan constructed a detailed brief, and it is hard to do justice.
- They also predicted an upsurge in inflation – which for now is here,
- One key element was increasing longevity and the greater dissaving of the more numerous old retirees.
- They also predicted a decline in inequality as workers' bargaining power rises after big additions to the global labor force around 1990.
- Summers cites greater global defense spending, higher investment needs associated with green transition, higher public debts.

Key demographic trends (UN projections)



Looking at one piece: Longer retirements

- Take an overlapping-generations economy with fixed population and lifetime *N*, working life *T*, real interest rate = zero, fixed endowment *Y*
- A representative generation maximizes $\sum_{t=0}^{N} u(C_t)$ → optimal consumption per capita $C_t = \bar{C} = \frac{T}{N} Y, \forall t.$
- In steady state saving = 0, but total wealth determines capital stock, higher wealth globally implies lower *MPK* and lower real interest rate.
- Economy's wealth per capita $W = \frac{(N-T)T}{2} Y.$
- Lower *T* raises *W* provided *T* > *N*/2.
- Higher retirement period $N - T$ implies more, not less, savings.

Caveats and extensions

- With populations shrinking as life expectancies grow, proportion of old dissavers will grow over time.
- But empirically, the old do not dissave that much on average – they may hold assets for bequests, or as precautions against health emergencies or living too long.
- Thus, detailed calibrated multi-country OG models, e.g., by Auclert et al. (2021) and teams of Bank of England researchers, show real rates continuing to decline through much of this century.
- Investment will also be lower as workforces age and the scope for profitable innovation contracts. But ... AI?
- At least for advanced economies, it is hard to be confident of sustained substantially higher real interest rates after the current disinflation is over.

A potential scorecard? State of play, 2023

	Higher real rates	Same old
Demographics	✗	✓
Productivity	?	?
Inequality	✗	✓
Global fragmentation	✗	✓
Government fiscal activism	✓	✗
Ambient uncertainty	✗	✓

Policy implications of low for longer rates

- Monetary policy
  - The problem of the ELB will not go away.
  - This will raise the premium on proposals like 3% targets or eliminating cash.
- Fiscal policy
  - Good news for public debt sustainability, but only if low real interest rates remain below growth rates.
  - If greater fiscal activism instead is decisive in raising real rates, without raising growth by as much, that could lead to public debt crises down the road.
  - Demographic pressures on fiscal sustainability could as well lead to a deterioration in social insurance and higher precautionary saving.
- Financial stability policy
  - Financial instability threats from low rates will remain.
  - Business models of banks, pension funds, insurance companies.

Thank you