# Natural and Neutral Real Interest Rates: Past and Future

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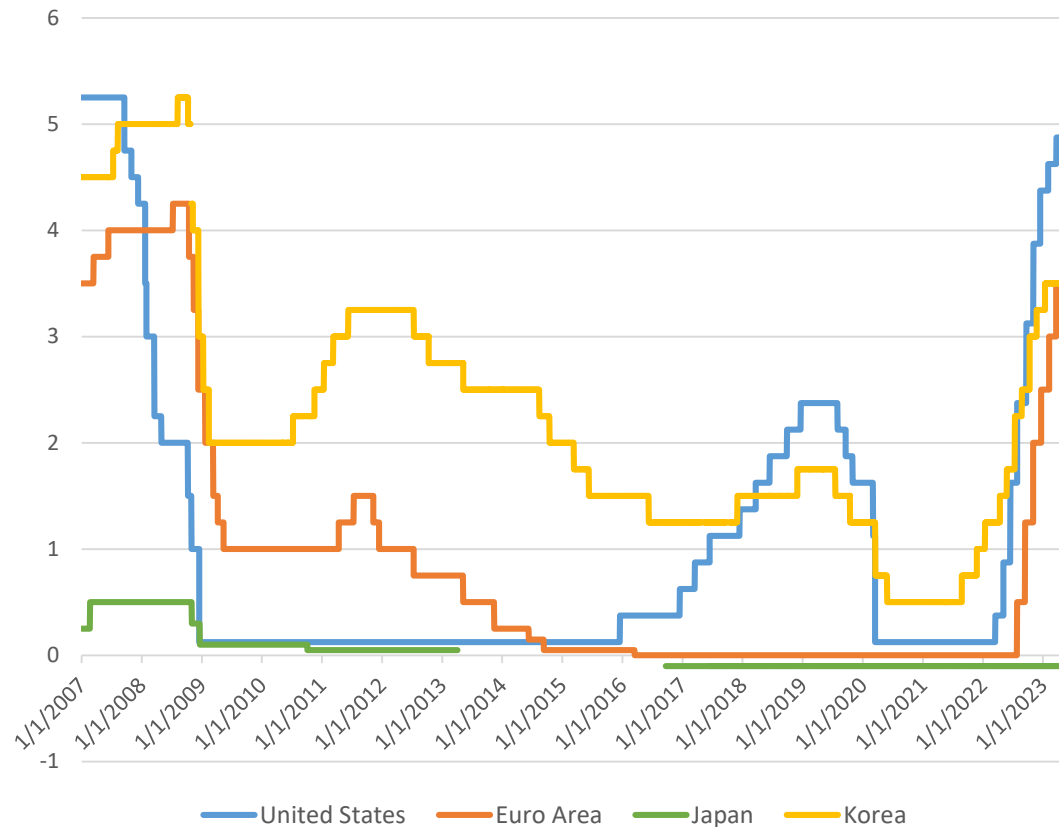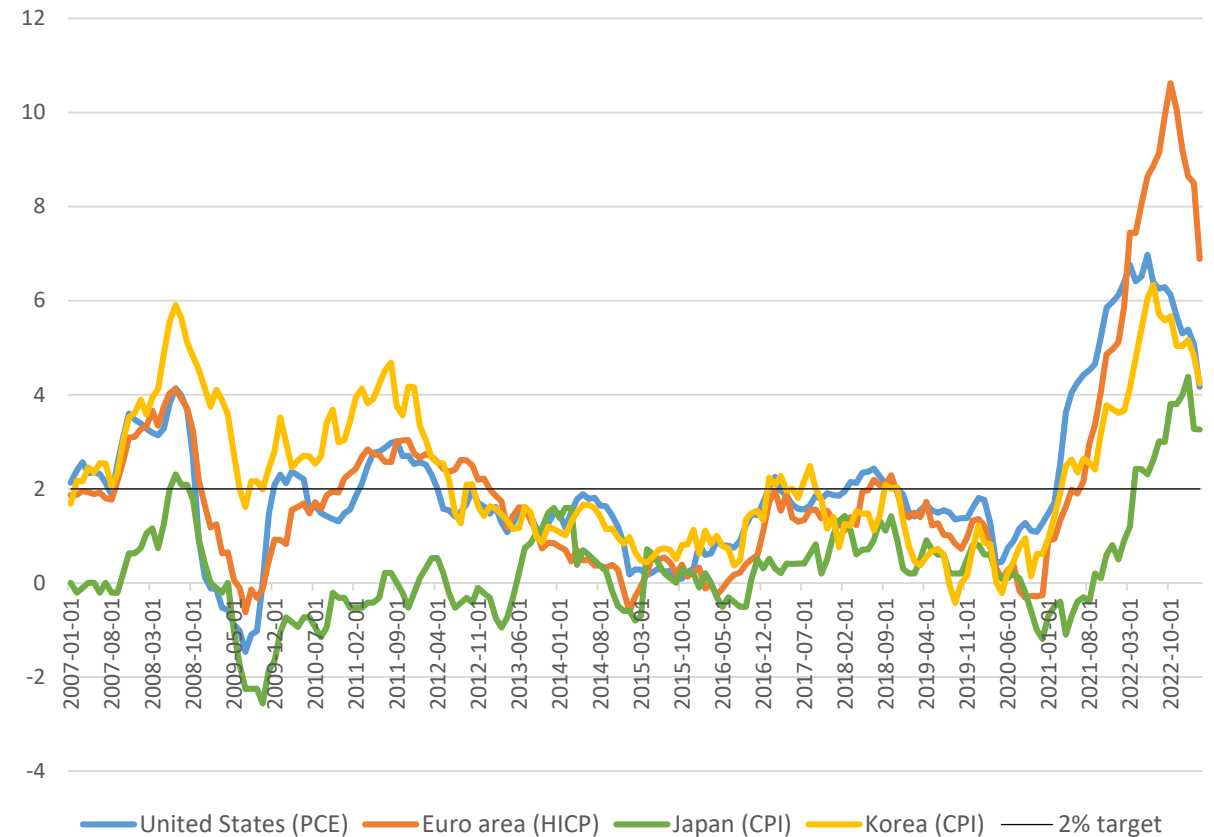
# For years, central banks had fought to make policy rates low enough; in 2021-22 were they too low?

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 (2003).

- But how can we measure it? Many approaches, measuring different things.

- And to predict future rates, we need to understand the driving forces – also theme of the April 2023 WEO.

# John H. Williams put it well nine decades ago



*"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 C. Williams, *Brookings Papers,* 2002.

# Fed Chair Jay Powell has echoed J. H. Williams

*"[W]e understand that it's a real rate that will matter and that needs to be sufficiently restrictive. And, again, I would say, you know ... "sufficiently restrictive" only when you see it .... [I]t's not something you can arrive at with confidence in a model or ... in various estimates ...."*

Chair Powell's press conference,
September 20, 2023
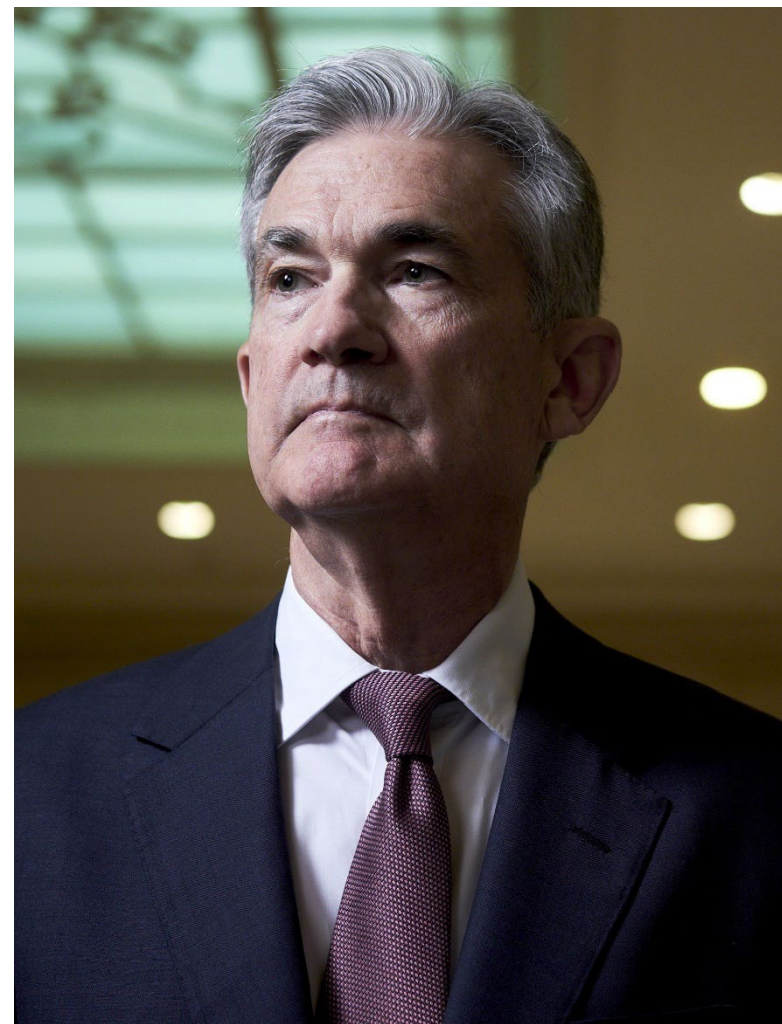
# Empirical approaches to assessing what the correct rate "must have been" are varied

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 (DSGE or OG).

4. Semi-structural (famously, Laubach and Williams 2003, and many variants).

5. Hybrids

# Distinguishing $\bar{r}$ from $r^*$

- The natural rate $\bar{r}$ (r-bar) is the flexible-price equilibrium short-run real rate of interest.

- The neutral rate $r^*$ (r-star) is the real rate at which monetary policy switches between accommodating to neutral.

-  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).

- In some empirical DSGE models, guiding monetary policy by $\bar{r}$ compares favorably with a simple Taylor rule (Barsky et al. 2014; Cúrdia et al. 2015)

# Do different methods measure $\bar{r}$ or $r^*$?

- Many methods hope that a very long-run forecast of $r$ will pin down $\bar{r}$ by stripping away the influence of short-run price rigidities (Del Negro et al. 2017). This approach also reduces the volatility of more short-run estimates.

- These methods not only conflate $\bar{r}$ with $r^*$, they abstract from relevant short-run factors that may predictably wane – e.g., an unsustainable external or fiscal deficit.

- Asset pricing and VAR approaches, for example, estimate long-run $\bar{r}$.

- Laubach-Williams (and some hybrids) arguably get closer to $r^*$.

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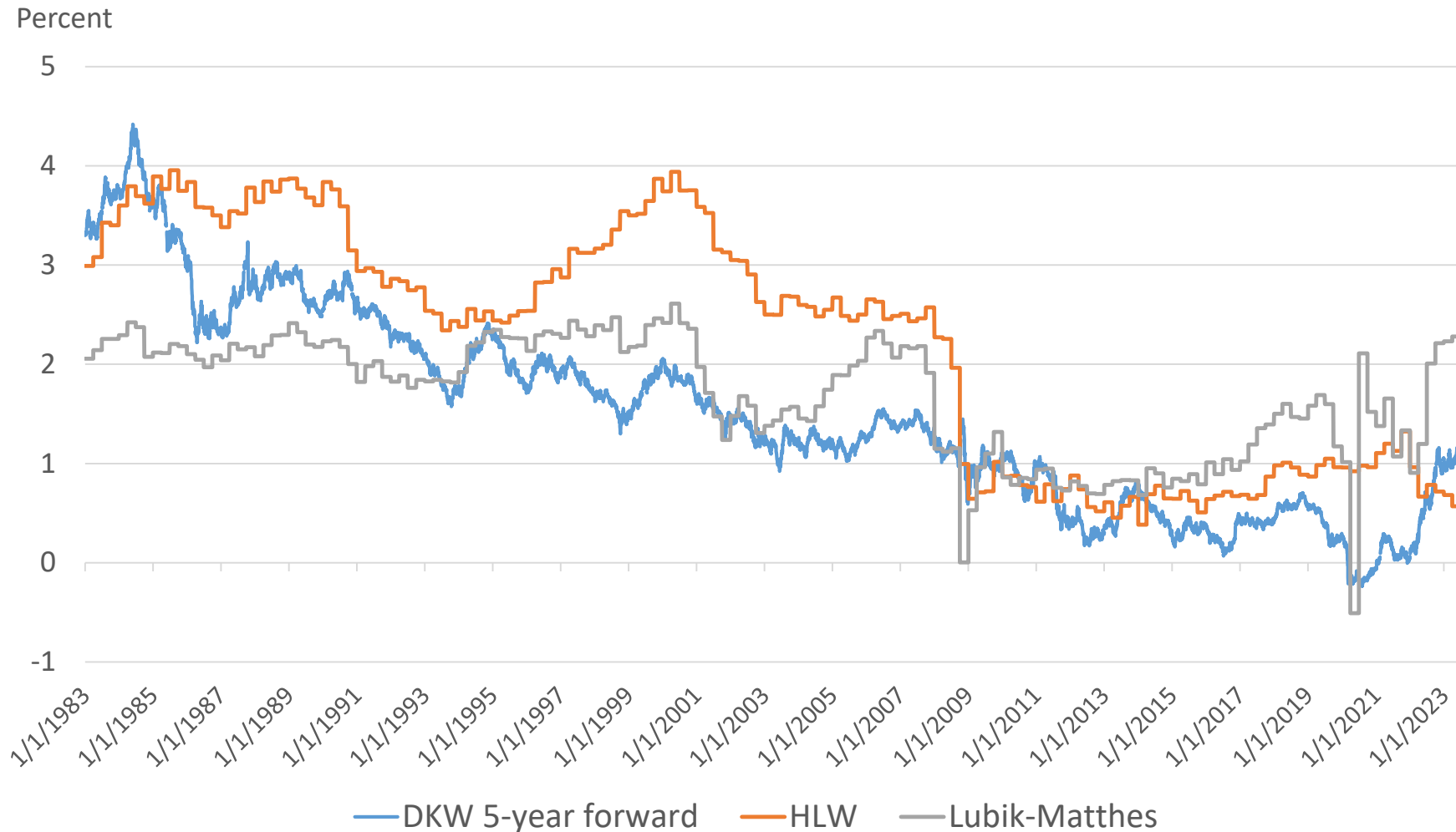


Much recent disagreement! (Noted in the press by Krugman and Keynes.)

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

- Financial conditions, including international capital-account shocks; for example, is $r^*$ lower if the long-term interest rate is higher?

- Imperfect credibility – what is part of the bank's job is signaling?

- Most empirical analogs of $\bar{r}$ and $r^*$ 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 both $\bar{r}$ and $r^*$, which do trend together.

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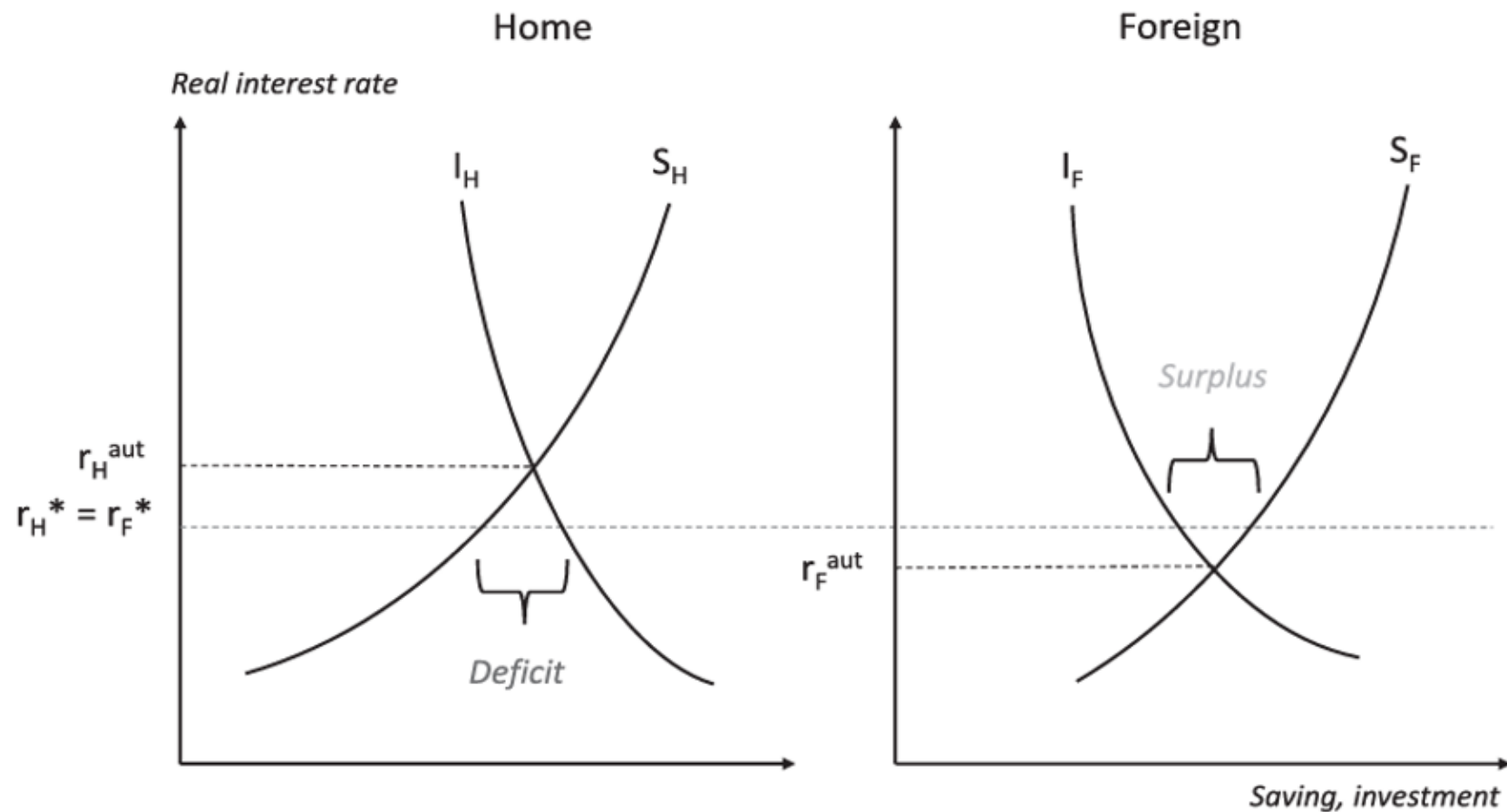


Percent
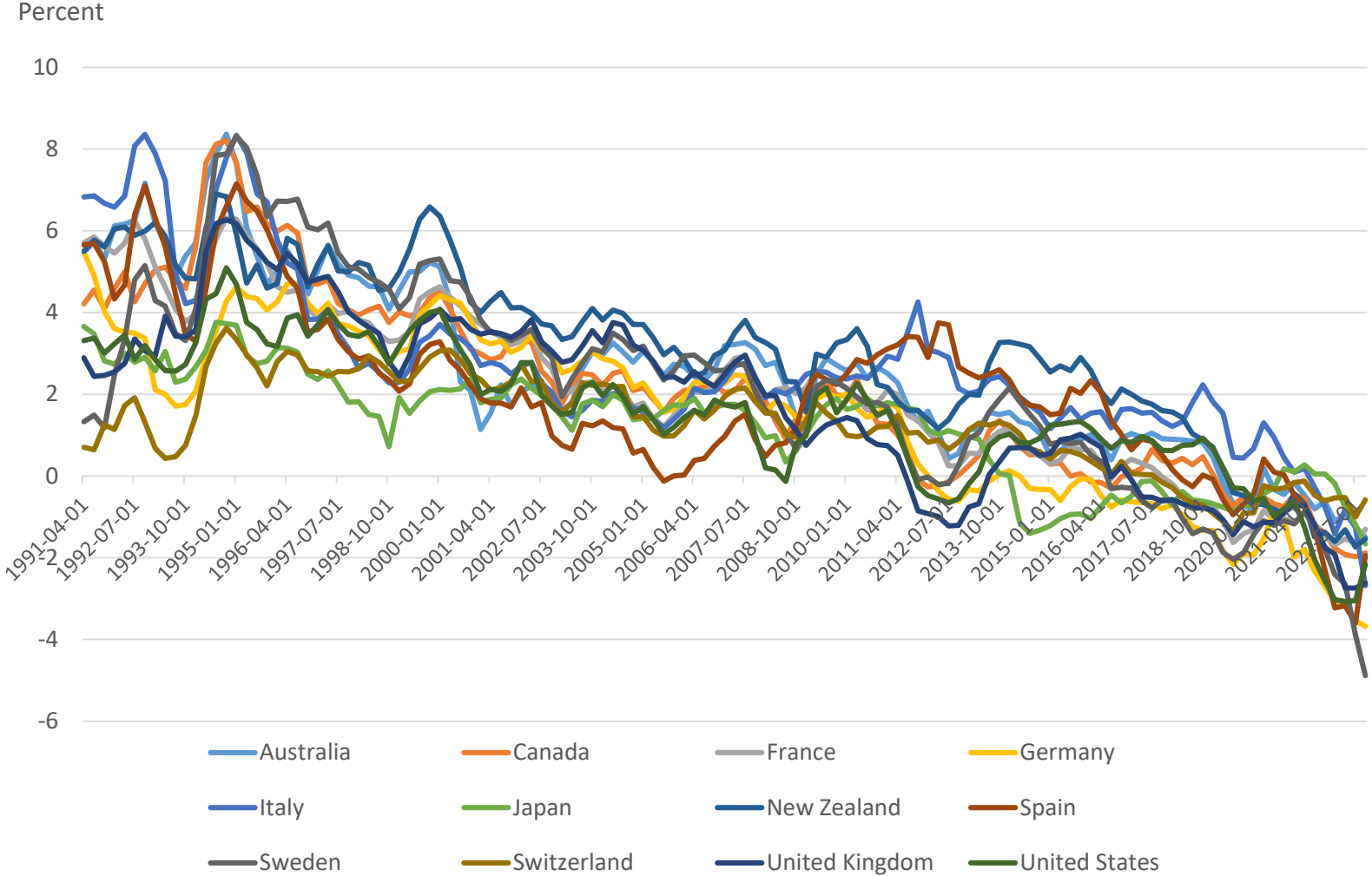
*Note*: Semi ex post real rates on government 10-year bonds

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



Percent
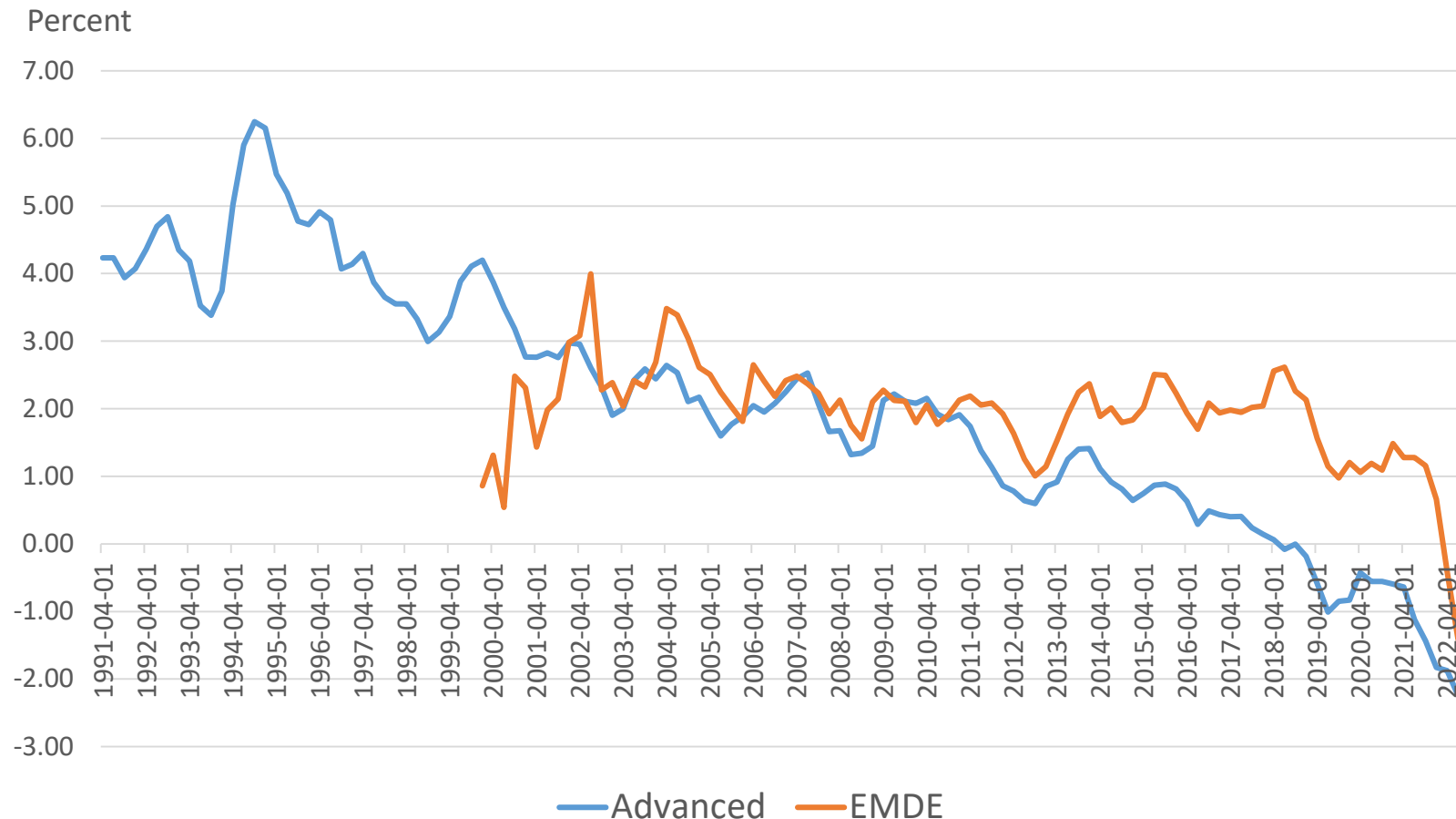
*Note*: Semi ex post real rates on government long-term bonds, simple averages over 12 AEs and 23 EMDEs

Advanced — EMDE

# 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.

# Since 2000, S&P 500 $E/P$ ratio did not fall as much as $r$ (nor has it risen as much recently)
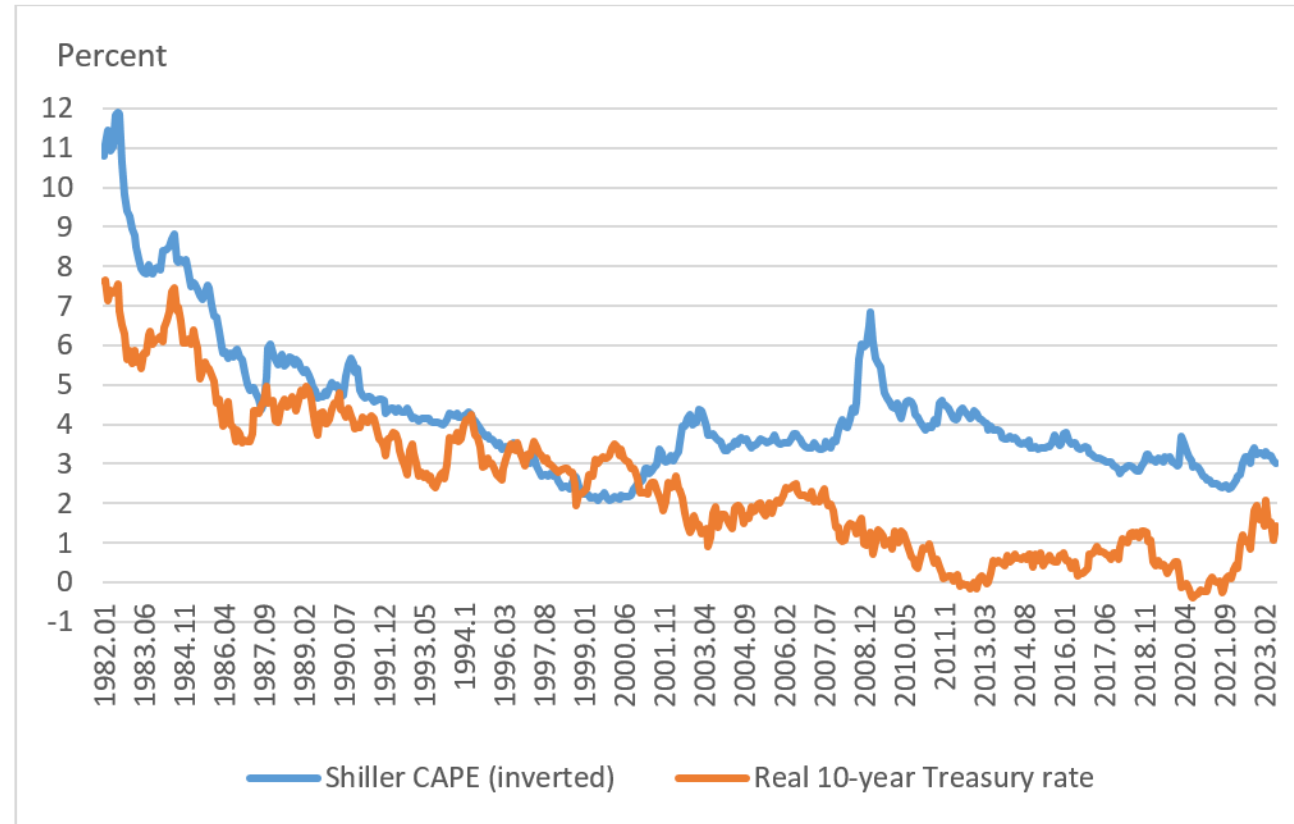


**Long-term U.S. real Treasury rate and cyclically adjusted equity earnings-to-price ratio**

Source: FRED (series REAINTRATREARAT10Y) and inverse cyclically adjusted S&P 500 total return price-earnings ratio from
http://www.econ.yale.edu/~shiller/data.htm

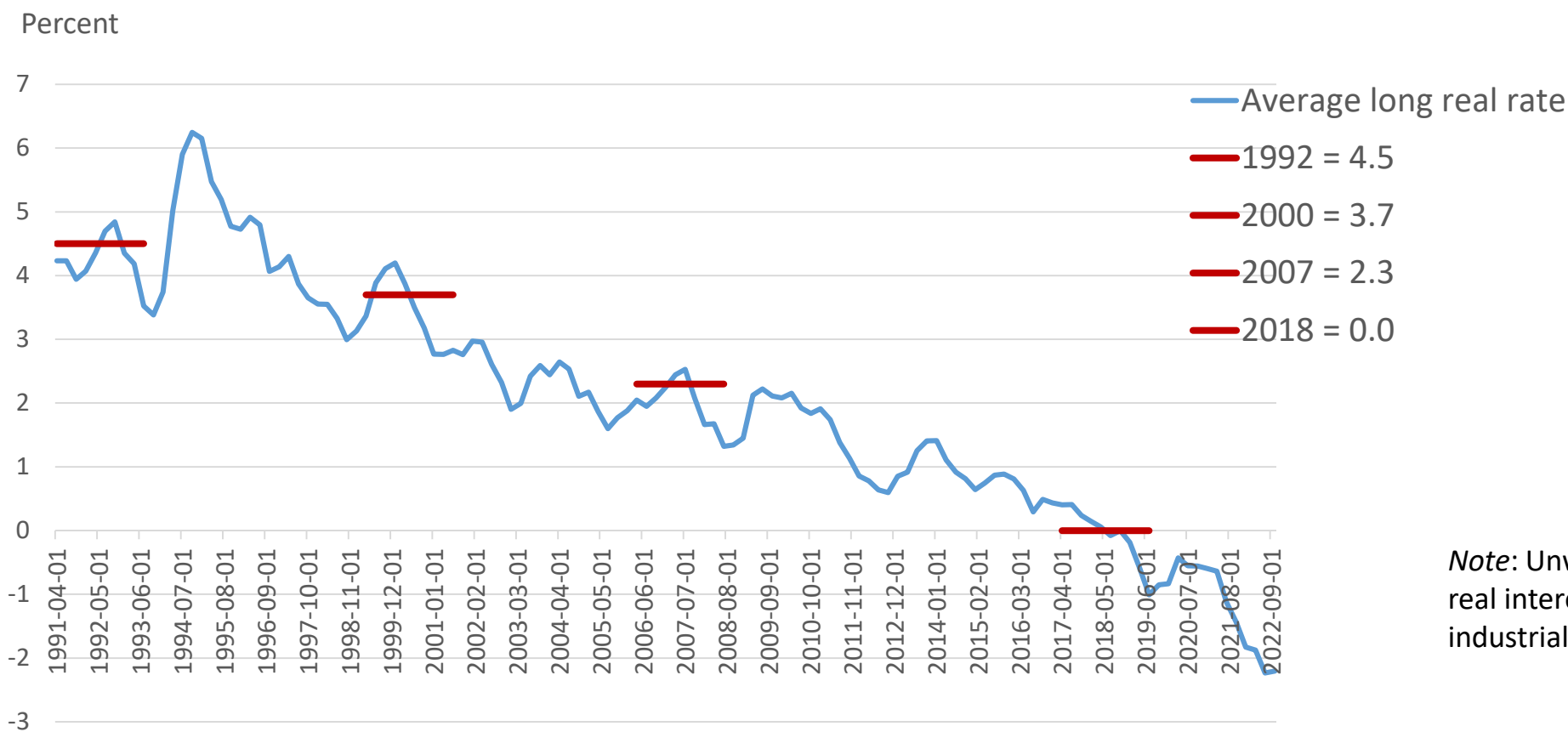# Global FX reserve demand lowered safe rates
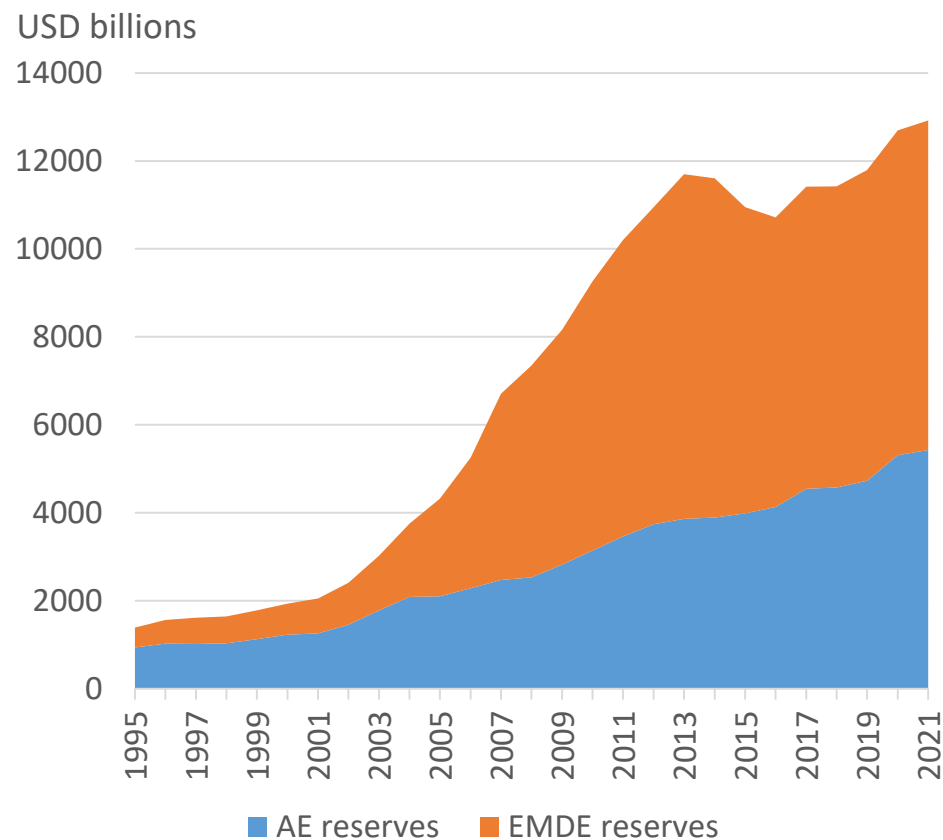


**Foreign exchange reserve stocks of advanced and EMDE countries, 1995-2021**
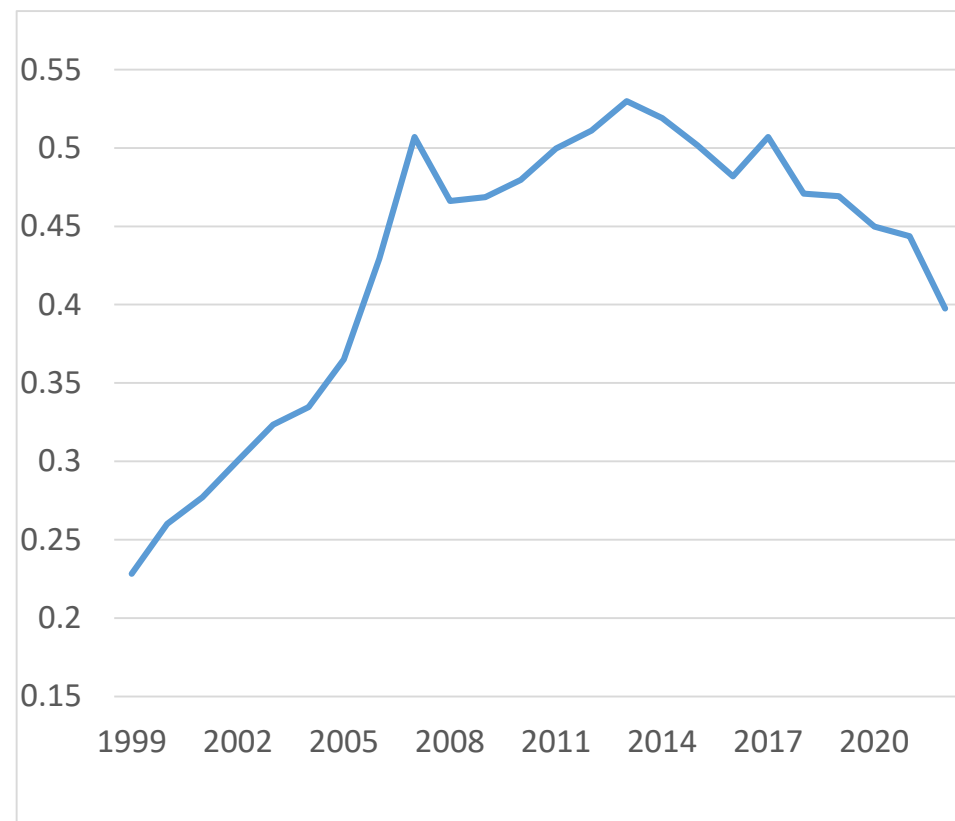
**Foreign exchange reserves as a fraction of global safe assets, 1999-2022**

# 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 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; euro area; 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?

# 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: *S* need not equal *I*!

- Equilibrium requires not only the right policy setting for the policy real interest rate, but also exchange rate, long-term interest rates, etc.

# Real rates have risen; will they stay so high?


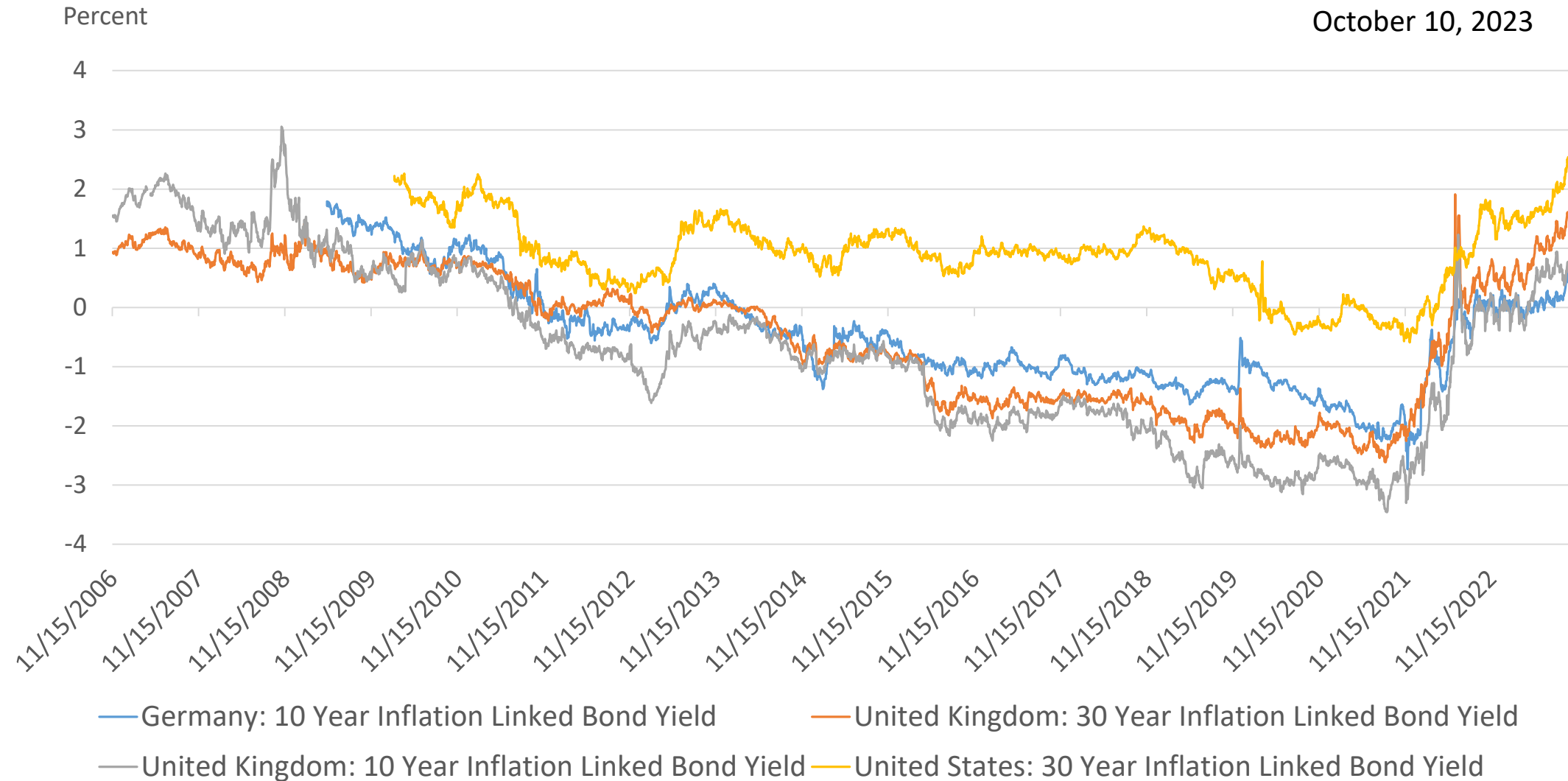
McKinsey&Company

McKinsey Global Institute

December 2010

Farewell to cheap capital?
The implications of
long-term shifts in global
investment and saving

*A cautionary quotation from the past:*

"[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)

# Long-term inflation-protected bond yields

Percent

October 10, 2023



Germany: 10 Year Inflation Linked Bond Yield

United Kingdom: 30 Year Inflation Linked Bond Yield

United Kingdom: 10 Year Inflation Linked Bond Yield

United States: 30 Year Inflation Linked Bond Yield

# Many factors in play

- Pre-COVID, pre-Ukraine C. Goodhart and M. Pradhan constructed a detailed brief in their book, and it is hard to do justice.

- They also predicted an upsurge in inflation – which indeed arrived, but is relenting.

- 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.

- Larry Summers and others cite greater global defense spending, higher investment needs associated with green transition, higher public debts.

# Several models currently disagree sharply



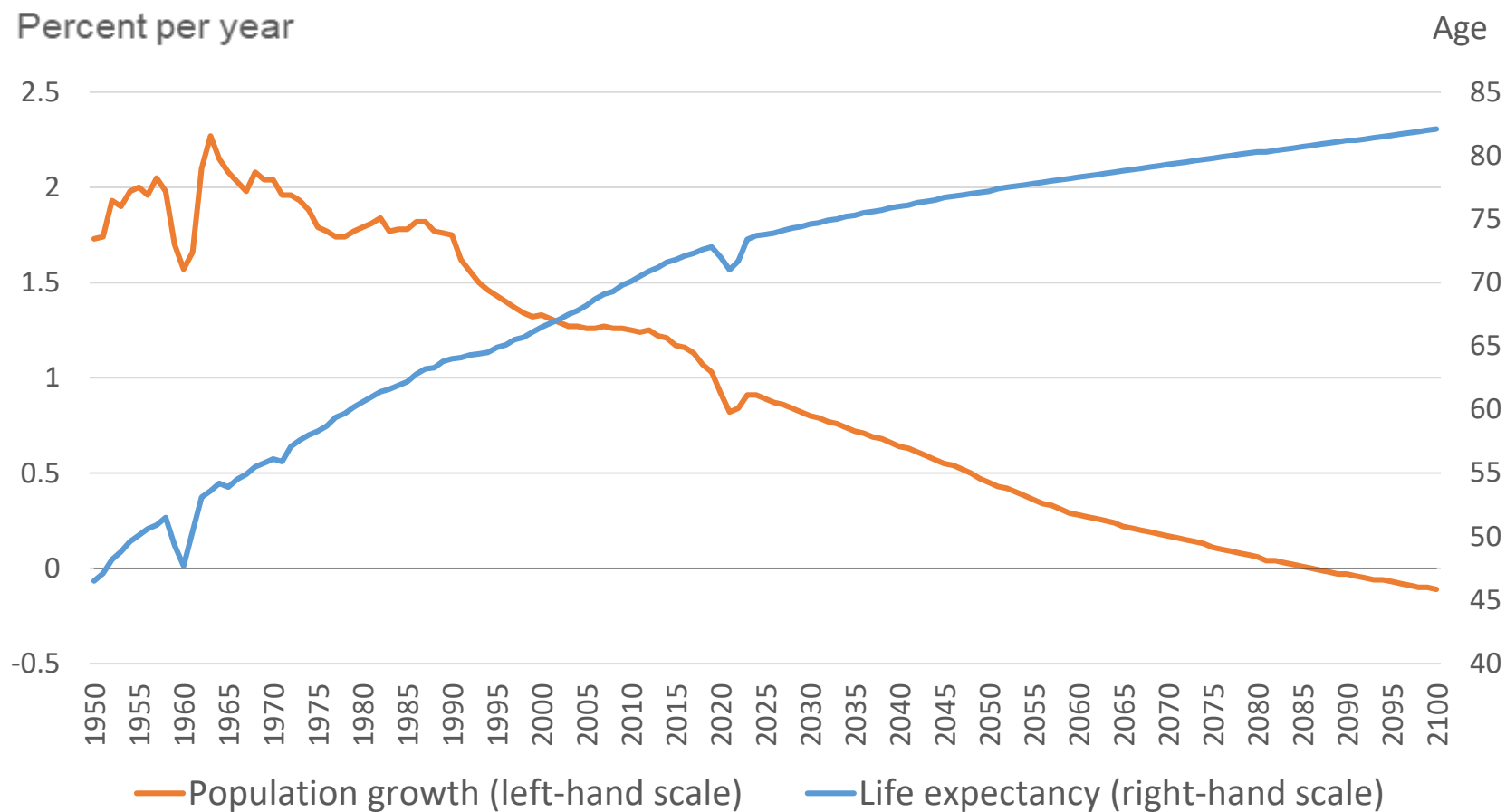The Low-Frequency Component of r* in the VAR and DSGE Models

Percent, annualized
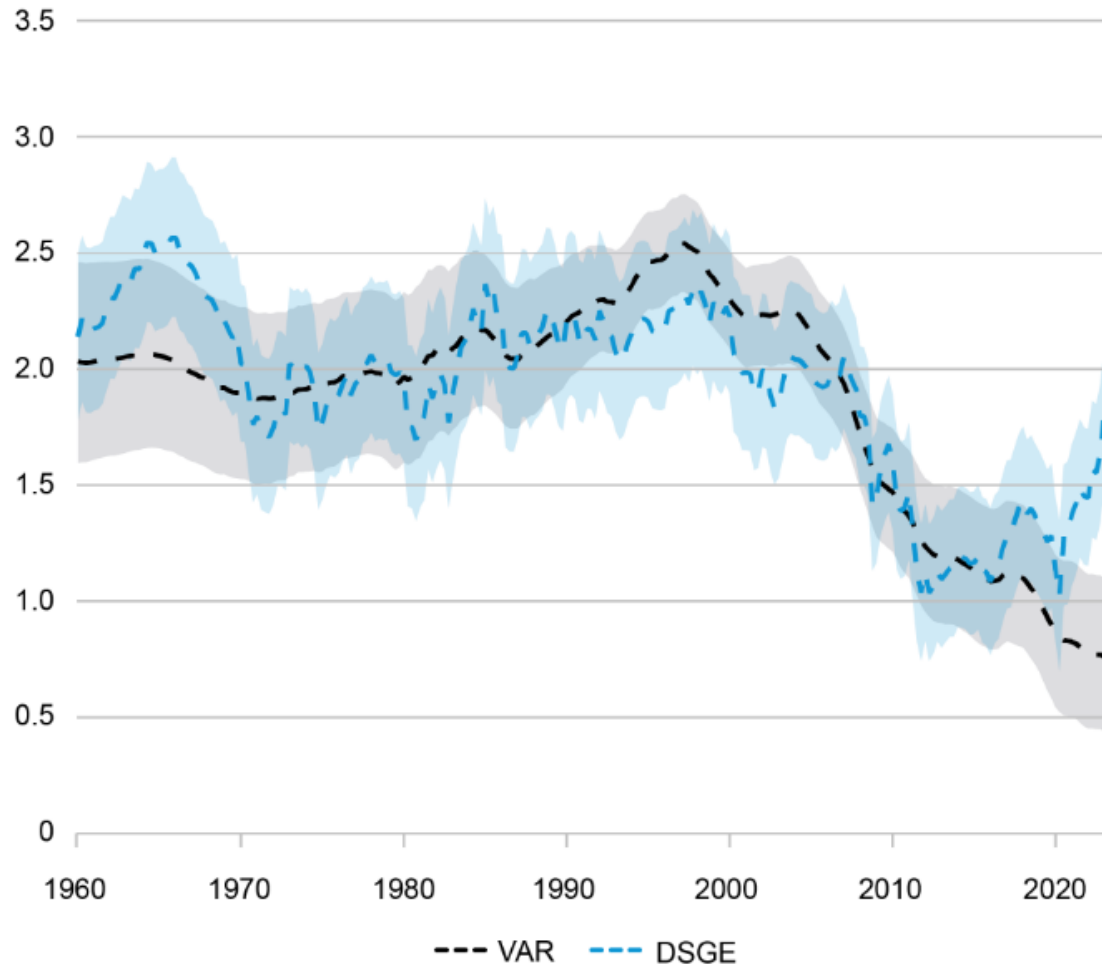
From Baker et al., "The Post-Pandemic r*," *Liberty Street Economics,* Federal Reserve Bank of New York, August 9, 2023. URL: https://libertystreeteconomics.newyorkfed.org/2023/08/the-post-pandemic-r/

# Key demographic trends (UN projections)

# Observations I

- Theoretically, longer retirements may imply more capital, lower *MPK*.

- With populations shrinking as life expectancies grow, proportion of old dissavers will grow over time.

- But empirically, the old do not dissave so much on average – they hold assets for bequests, to guard against health mishaps or living too long.

- Detailed calibrated multi-country OG models, e.g., by Auclert et al. (2021) and Bank of England teams, show real rates continuing to decline through much of this century; see also April 2023 WEO.

# Observations II

- Investment will also be lower as workforces age and the scope for profitable innovation contracts (Jones 2022).

- But … AI?

- Fragmentation of the global economy?

- Further geopolitical risks?

- At least for advanced economies, I am not confident of sustained high real interest rates once the current disinflation is over.

# Policy implications if low rates return

- 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 austerity or 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
  - ➤ Financial instability threats from low rates will remain.
  - ➤ Business models of banks, pension funds, insurance companies.

# Thank you