

## Analysis

April 2023

## Prospects for the neutral real rate of interest

- The 'neutral' rate is an important concept for policymakers and practitioners alike.
- It is the rate at which the policy stance is neither boosting nor constraining the economy.
- We expect 'neutral' real rates to be a bit higher than they have been since 2008.
- That expectation would change were private or public investment to change markedly.

Few variables are of greater macroeconomic significance than the rate of interest. It reflects society's choices regarding consumption today versus consumption tomorrow; it reflects the returns to forgoing consumption in favour of investment; and it balances and clears the market for saving and investment.<sup>1</sup>

The rate of interest can be expressed in both nominal and real (i.e. inflation-adjusted) terms. In unusual times, such as the present, when in many economies the official nominal interest rate is markedly lower than the contemporaneous rate of inflation, there is heightened interest in the real (i.e. inflation-adjusted) rate of interest and its prospects.

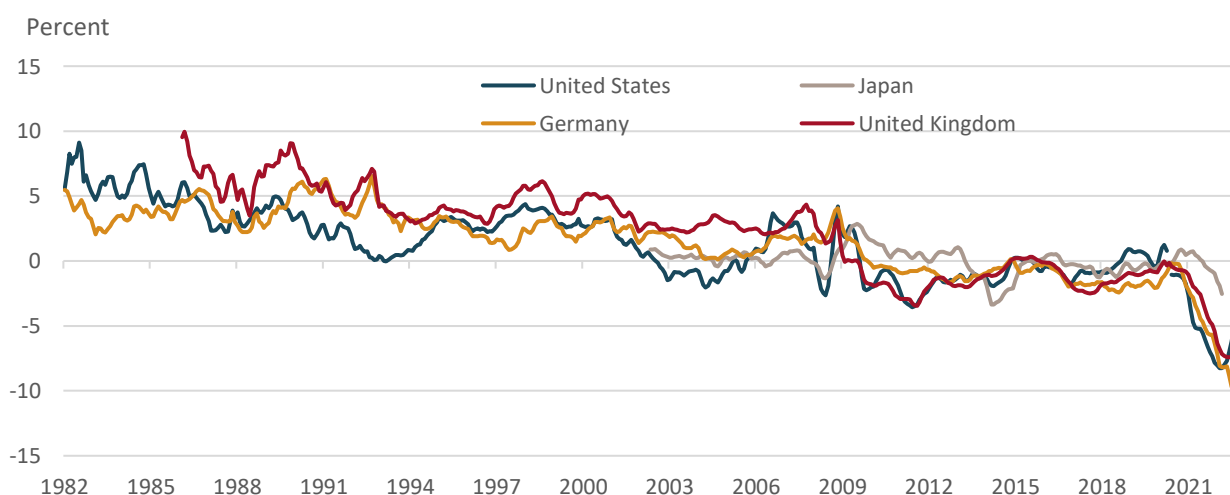
### Definitions and measures

The real rate of interest can be defined, and hence measured, in many ways. For example:

- **The contemporary nominal policy rate minus the contemporary rate of inflation.** Thus defined, the real rate in the US fell to around -7.0% in Q1 2022 – its lowest since 1947.<sup>2</sup> As inflation slows to more normal rates, the real rate stands to become less negative: indeed, on this contemporary basis, the US rate has already risen to 'just' -0.4%. Another measure, used by the IMF, takes the 3-month interbank rate minus realised inflation (see Figure 1).
- **The contemporary nominal policy rate minus an expected rate of inflation.** This can yield a markedly different estimate. Again, taking the US as an example, on the basis of the Michigan 5-year expected rate of inflation, the US real rate of interest troughed at -2.9%, and is currently around 2%.
- **The market rate for index-linked government bonds.** On this basis the US real rate of interest over a 5-year or 10-year horizon currently expected by investors in US Treasury

The rate of interest can be defined in many ways

Figure 1: (Ex post) real short-term interest rates in selected advanced economies



Source: IMF World Economic Outlook (WEO), April 2023

Note: Real interest rates are calculated here as the difference between 3-month interbank rates and the average of the realised inflation measured by the CPI in the next three months for each country.

Inflation-Protected Securities (TIPS) are both at around 1.2%. There are other definitions, less easy to measure but of considerable policy and other significance, including importantly the ‘neutral’, or ‘natural’, or ‘equilibrium’ rate.

## The neutral real interest rate

The neutral rate is of particular interest

The ‘neutral’ (or ‘natural’, or ‘equilibrium’) rate is taken to be the rate at which an economy is neither overheating nor being reigned back, where the output gap is at zero and inflation expectations are stable at the inflation target.

The neutral rate is a reference point for central banks that use it to gauge the stance of monetary policy. Differences between a neutral rate and a policy rate can be assumed to be transitory and ‘out of equilibrium’.<sup>3</sup>

In a world that is running significantly below capacity, as measured for example by the non-accelerating inflation rate of unemployment (NAIRU), policymakers may set the policy rate below the (estimated) neutral, or equilibrium, rate in an attempt to use money markets to steer the goods markets by boosting investment demand, generating income, and creating saving.

Conversely, if the world economy is overheating, the policy rate may be raised above the neutral rate in order to bear down on domestic expenditure and thereby inflation.

If such a policy shock were unique to an individual economy, there could also be an exchange rate effect. A country-specific rate hike in response to a tight inflationary labour market, for example, might prompt a jump in the country’s exchange rate such that it would be expected to depreciate along a path towards its long run equilibrium. This would, in principle, offset the relatively higher path of domestic interest rates, and leave the expected configuration of returns unchanged across countries (so-called uncovered interest parity). And conversely.

## Determinants of the neutral real rate

We take the world real long-term rate of interest to be the product essentially of the interaction between desired (public and private) investment ( $I^*$ ) and desired (public and private) savings ( $S^*$ ).<sup>4</sup>

Individual countries’ real long-term rates of interest will, to the extent that capital movements between countries are essentially unrestricted, be higher or lower than the world rate, the extent depending on the evolution of countries’ individual risk premia relative to the world average.

Notwithstanding its being of considerable interest and significance, the neutral rate of interest is not directly observable. Near term, this unobservability arises in part because policy is rarely neutral. But, more fundamentally, it is because it is impossible to measure ‘desired’ investment and ‘desired’ savings directly: only *ex post* outcomes are observable.

Nevertheless, various attempts have been made to estimate what the real neutral rate of interest has been (see Figure 2).<sup>5</sup> They may or may not be wholly accurate; but it is widely accepted that, more or less regardless of how defined and measured, the world real neutral rate:

But it fell in the 1980s, after 2008 was near zero

- Fell sharply in the 1980s, declining by around 300 basis points; and
- Settled at close to zero after 2008.

To the extent that this is indeed so, it can be inferred with reasonable confidence that over the past several decades – at the world level and thereby in many countries individually – desired, or *ex ante*, investment ( $I^*$ ) has been systematically weak relative to desired, or *ex ante*, savings ( $S^*$ ).

Indeed, to clear the market, (real) interest rates, measured on a contemporaneous basis, have not only been low by historical standards, but indeed have also fallen continually.<sup>6</sup>

**Strong world saving was a contributing factor ...**

**The determinants of underlying saving** have received much attention. This is in large part because projections of where rates will go are only as good as the projection of the underlying drivers. Factors potentially boosting  $S^*$  include demographic and social conditions such as: baby-boomers being of prime earning age; increased female participation in the workforce; growth in more productive urban working populations, especially in Asia; globalisation; the opening up of the former Soviet Union and China; and rising inequality (the rich tend to save disproportionately more).

There is some debate about whether some of these will be as important in the future as they have been in recent decades.<sup>7</sup>

**... weak investment was another**

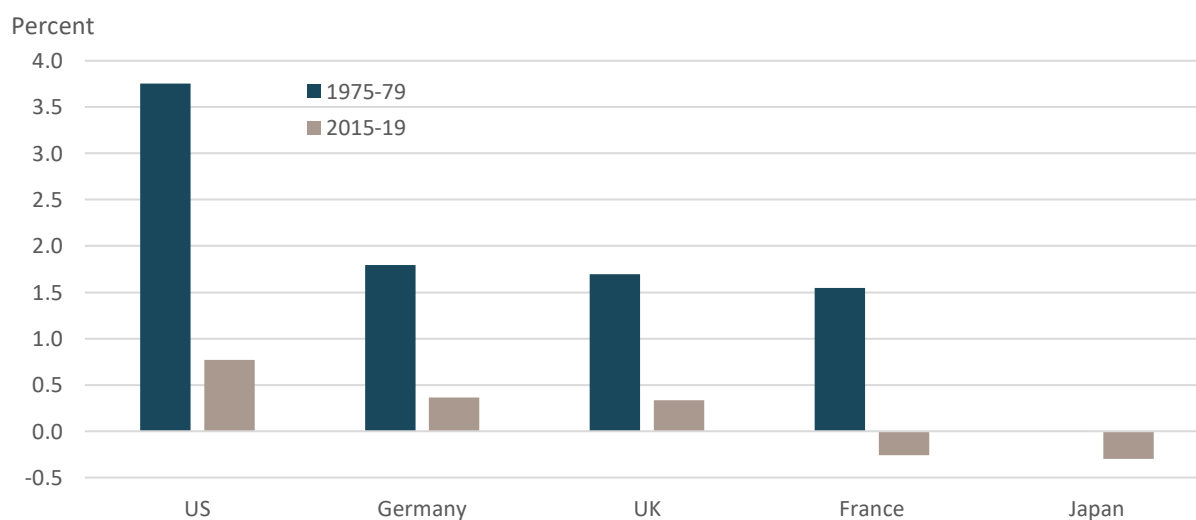
**The determinants of long-run investment** seem to have received somewhat less attention, and raise a number of questions, including why investment in advanced economies has not risen in the presence of 'free money'.<sup>8</sup> (See Figure 3 below)

Doubtless the cost of capital is one influence. Another is the perceived level of risk, but given that the spread between equity and bond returns is at the moment narrow by historical standards, this suggests that the (relative) safety of bonds is not currently a burning issue for investors.<sup>9</sup>

A third influence is what Keynes dubbed investors' 'animal spirits',<sup>10</sup> one determinant of which, perhaps particularly important since the 2008 Global Financial Crisis, is the private sector's expected rate of growth of output – the so-called 'accelerator' mechanism. If entrepreneurs expect output growth to be slow, they invest cautiously; and collectively, in a self-fulfilling prophecy, they bring about the outcome that they had been expecting.

Finally, changes in total factor productivity growth (the total amount of additional output produced with all factor inputs in the economy) also drive natural rates.<sup>11</sup> A secular slowdown in the return on capital would lead to a stagnation, *ex-post*, in growth of  $I$  and  $S$ , and a lower neutral real  $r$ . Some practitioners argue that this is exactly what has been happening.<sup>12</sup> Others argue that the 'fourth 'industrial' revolution' is entering a transformative and disruptive phase. No one can predict technological breakthroughs with accuracy, but the

**Figure 2: Neutral rate estimates**



Source: IMF World Economic Outlook (WEO), April 2023

Note: The estimates from the structural model are based on Platzer and Peruffo (2022).

impact of artificial intelligence, genetic engineering, and more efficient energy technologies could revolutionise productivity.<sup>13</sup>

### Prospects for the (long-run) neutral rate

The neutral rate is challenging to forecast

It is not possible realistically to forecast the economic cycle more than a few years ahead. Hence, the longer-term concept of the world neutral real rate reduces to a consideration of the likely forward rate, on the assumption that policy rates return to neutral.

There would seem to be four basic scenarios for the evolution of the neutral real rate, driven by likely paths in global saving and investment:

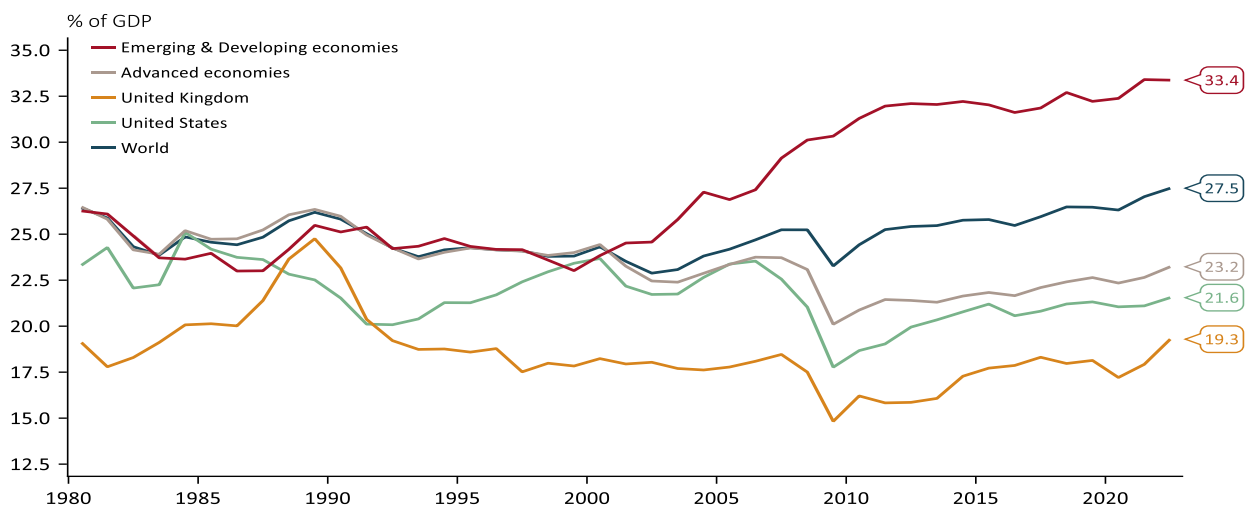
There are four basic future possibilities

- 1. Return to the near-zero pre-inflation-burst low real rate.** Companies expect only modest growth; governments see their expenditure as seriously deficit- and debt-constrained; people and companies continue to save at much the same rate as in the past; and the real rate of interest thereby stays low – around the near-zero figure that prevailed for much of the two decades up until 2020.
- 2. Rise due to a secular decline in global saving.** Baby boomers of prime working age mature and retire, at least in rich countries. This demographic trend is partially offset by continued growth in higher-earning, urbanised workers in developing countries, particularly in India. Re-shoring and thereby a sharper decline in global trade and investment lead to lower global saving, raising the neutral rate.
- 3. Rise due to stronger private sector investment.** A number of factors lead to at least somewhat higher levels of investment, including in the new digital technologies and AI. Quantitatively even more important is increasing recognition that the world is going to have to move – and quickly – towards a zero-carbon emissions end point.

While much of the requisite investment can be financed out of typical rates of saving, and effected via the normal scrap and replace process,<sup>14</sup> there is some additional ‘up-front’ investment. With renewables now cost competitive with hydrocarbons in many parts of the world, private sector investment in renewable technologies strengthens.

- 4. Rise due to government investment.** Some governments come to regard investment in climate change and defence as priorities that override concerns about the public debt. It

Figure 3: Investment/GDP ratios in selected countries/regions



Source: IMF WEO database via Macrobond

becomes accepted that there is more fiscal space for public borrowing than has hitherto been acknowledged. Public *ex ante* investment rises relative to national *ex ante* saving. (For more, see box.)

#### **Box: Fiscal space – roomier than recognised**

The sustained fall in global neutral real interest rates suggest there has been, and almost certainly still is, scope for the public sector to borrow to invest without prompting a rise in rates or crowding out private investment. Indeed, by creating capacity through investment in infrastructure, skills and new technologies, targeted investment has the potential to restore productivity growth and lower public debt/GDP, as well to counter longer-term inflationary pressures.

If public borrowing had shaped capital market conditions, then rates would have risen as profligate governments bid for limited funds. This did not happen. Investors until recently have been willing to buy government debt at high prices with paltry (or negative) returns reflected in persistently low neutral real interest rates.

More recently, higher policy rates have lowered the price of public bonds and pushed up debt servicing costs for sovereigns: but this largely reflects a rebalancing and front-loading of the public burden. With real rates negative, inflation is eroding the real value of public liabilities, shifting trillions of dollars from the balance sheet of bond issuers to that of bond investors, and generating unexpected fiscal space. Italy's debt-to-GDP ratio, for example has fallen 7 ppts in the year to 2022 Q3, while that of the US is estimated to have fallen 20 ppts from its pandemic peak.

## Implications for policy

### Public policy may prove a determining influence

Neutral real rates post WWII were almost certainly highest in the periods of the Marshall Plan and Cold-War military spending, when investment and growth in rich countries was high. Thereafter they fell, particularly from around 1980.

To the extent that public sector policy signals have been mixed and muddled, at best, in particular as regards decarbonisation of highly regulated sectors including energy, transport, and buildings, this may have inhibited  $I^*$ . Certainly, we are told by many investors that, while there is no shortage of money for investment, they have long felt unable to trust the policy environment to be able to generate a relatively risk-free long-term return. This is perhaps particularly important in a world characterised by path-dependency and scale economies in production and discovery, whereby early investment systemically affects outcomes.

In recent years the role for policy in boosting  $I^*$  may have become potentially even more important, given that the low-cost technologies of tomorrow require costly investment today. The so-called Inflation Reduction Act (IRA) in the US may even be a game changer. Interest rates fell after post-WWII publicly-steered efforts at reconstruction: the Marshall Plan and Cold War competition (e.g. the moon-shot mission) provided a credible policy steer to channel investment. Now, maybe climate policy (as per the IRA) can drive a scaled-up return in  $I^*$ .

## Conclusions

A wide range of views is on offer from various commentators:

- Philip Coggan in the Financial Times recently<sup>15</sup> foresees a “*great unwinding*”, after perhaps one last hurrah of central bank easing, with a secular rise in real rates.
- The IMF view, essentially shared by Olivier Blanchard, by contrast expects that “... *once the current inflationary episode has passed, interest rates are likely to revert toward pre-pandemic levels in advanced economies.*”<sup>16</sup>

We expect the  
neutral rate to  
increase somewhat

- Lawrence Summers avers that the real neutral rate of interest is likely to settle at a somewhat higher value than in recent decades, but is highly unlikely to reach the heights of the immediate post-WWII decades.<sup>17</sup>

For our part, we judge that there is ample scope for public policy to boost investment, partly through direct investment funded by public borrowing but mostly through clear, credible, and predictable policy intervention to guide expectations and give confidence to investors.

Hence we align with Summers: our expectation is that the real neutral rate of interest will settle at a somewhat higher value than in recent decades, perhaps 1 or 2 percent but not more, reflecting *inter alia* a political shift towards active industrial policy to drive investment.

All this is highly uncertain, however, so:

### Watch for

There are four key  
developments to  
watch for

- An accelerated race to invest in production, distribution, and networked installation of 'smart' and clean energy.
- Any significant upward trend in world investment, perhaps, but not necessarily, in renewables (driven by public intervention and competitive industrial strategies).
- Evidence that a bounce-back in investment, possibly together with the digital revolution, boosts productivity growth, relieves capacity (and thereby inflation) pressures, and generates saving which tempers any rise in the neutral rate.
- Reduced concerns about fiscal space as inflation erodes public debt, investment requirements become clearer, and the geopolitical race to secure reliable energy accelerates.■

## Endnotes

- <sup>1</sup> For example, at a time when trillions of dollars of investment will be required to transition the global economy to cleaner, and ultimately more efficient, energy sources, the projected cost of borrowing is of critical importance. By the same token, the rewards to saving will also matter in a world of ageing demographics.
- <sup>2</sup> The only times in the past one hundred years that real interest rates, measured in that way, were lower than in Q1 2022 was in 1947 (-18.3%), and 1942 (-11.5%). [Real Interest Rate - 151 Year Chart | Long term trends](#)
- <sup>3</sup> If, for example, the world is hit by an inflationary shock, such as a sharp rise in one or more global commodity prices, central banks will likely raise policy rates to prevent overheating and to counter inflation – as they have been doing since the commodity and food price surge induced by the Ukraine war and a number of climatic events. The contemporaneous world real interest rate is thereby above the neutral rate in the short run.
- <sup>4</sup> *Ex post*, investment and savings are equal, by identity i.e.  $I \equiv S$ . But *ex ante* (or ‘intended’) investment and saving need not be equal – the investment that firms and others wish to undertake can be greater than, equal to, or less than the amount that savers intend to save. i.e generally.  $I^* \neq S^*$ , where the asterisk denotes ‘intended’. To the extent that there is a discrepancy between the two, the (real) rate of interest adjusts until the two become equal.
- <sup>5</sup> See for example Rachel L and Smith TD (2015). *Secular drivers of the global real interest rate*. Bank of England, Staff Working Paper No. 571; Rachel L and Summers LH (2019). *On Secular Stagnation in the Industrialized World*. NBER Working Paper 26198; Michael Ng and David Wessell, [The Hutchins Center Explains: The neutral rate of interest \(brookings.edu\)](#); Platzer, J. and Peruffo, M. (2022). [Secular Drivers of the Natural Rate of Interest in the United States: A Quantitative Evaluation \(imf.org\)](#); and IMF [World Economic Outlook, April 2023: A Rocky Recovery \(imf.org\)](#). Chapter 2.
- <sup>6</sup> There is an apparent paradox because, while in one sense the world is awash with ‘too much saving chasing too little investment’, it is also apparent that in another sense there has been too little saving: the amount of consumption using natural (and other) resources is unsustainably high. We will turn to that in a subsequent *Global Letter*.
- <sup>7</sup> See for example Goodhart C and Pradhan M (2020) *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival*. Palgrave Macmillan. <https://www.palgrave.com/gp/book/9783030426569>
- <sup>8</sup> It is dynamically inefficient for the real rate of interest to remain below the growth rate for long periods. American Economist Paul Samuelson is reported to have quipped that if the neutral rate of interest were zero, almost any investment would be profitable, and it would be worth knocking down the Rockies in order to lower transport costs. Yet patently nothing remotely like this has happened.
- <sup>9</sup> For more, see the debate between Olivier Blanchard and Lawrence Summers: <https://www.youtube.com/live/df5csVeBcrQ?feature=share>
- <sup>10</sup> Defined by Keynes as “... a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.” Keynes, John Maynard (2016). [General Theory Of Employment , Interest And Money](#). Atlantic Publishers. p. 144. [ISBN 978-81-269-0591-1](#).
- <sup>11</sup> In a dynamically efficient economy, the neutral real interest rate should approximate to the economy’s growth rate. Given diminishing marginal products of factors, if the neutral real interest rate ( $r$ ) is below the growth rate ( $g$ ) such that  $r < g$ , then investment should rise until the marginal product of capital falls to the level at which consumers wish to intertemporally spread utility from consumption (and conversely). In practice, changes in perception of risk imply that this is not always the case, as with the current mystery as to why investment is so low when  $r < g$ ? Nevertheless, the natural rate does broadly track global growth, as evidenced by the correlated path of both in the post-WWII era (high in the 50s and 60s then trailing back to current lows).
- <sup>12</sup> For example, Robert Gordon (*The Rise and Fall of American Growth The U.S. Standard of Living since the Civil War* 2015) argues that the rate of technical progress has slowed, after peaking last century. The ICT revolution, he argues, is less important to driving economic growth than were the five great inventions of the period 1870 to 1970: electricity, plumbing and urban sanitation (for example flush toilets), chemicals and pharmaceuticals, the internal combustion engine, and modern communication. Whereas transport mobility and consumer durables changed unrecognisably between 1920 and 1970, in the fifty years that followed, we still travel on jet planes of similar speed and use mostly the same domestic appliances.
- <sup>13</sup> A number of authors argue that that the increase in computer speeds since the 1970s has continued apace, and that the likes of Gordon underestimate the impact that the social media make to people’s lives (Combes et al, 2016. [Long](#)



[live the technology revolution](#)). Brynjolfsson and McAfee (*The Second Machine Age: Work Progress, and Prosperity in a Time of Brilliant Technologies* 2014) argue that IT and digital communication are now just reaching an inflection point that speeds up also the ease with which new ideas can be combined and recombined (see Brynjolfsson, E. and McAfee, A.). The smartphone is an example of synergistic amalgamation of innovations, integrating the touchscreen, voice recognition, GPS, motion sensors, faster and more compact computing, random-access memory, mobile telephony, and the internet. Tyler Cowen ([Is Innovation Over? The Case Against Pessimism](#), 2016) argues that more individuals than ever before have the potential to innovate.

<sup>14</sup> For a computation to demonstrate this proposition, see J. Llewellyn and S. Sepping, 20221. Investment requirements for a 2<sup>0</sup>C world. Llewellyn Consulting, 6 October.

<sup>15</sup> Philip Coggan, 2023. *Get ready for the great unwinding*. Financial Times, 11 April.

<sup>16</sup> See IMF [World Economic Outlook, April 2023: A Rocky Recovery \(imf.org\)](#). Chapter 2.

<sup>17</sup> For a full exposition of their views, see the interview with Adam Posen *Summers and Blanchard debate interest rates*. 8 March 2023. See [insider@piie.com](#).

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