South African Reserve Bank
Occasional Bulletin of Economic Notes
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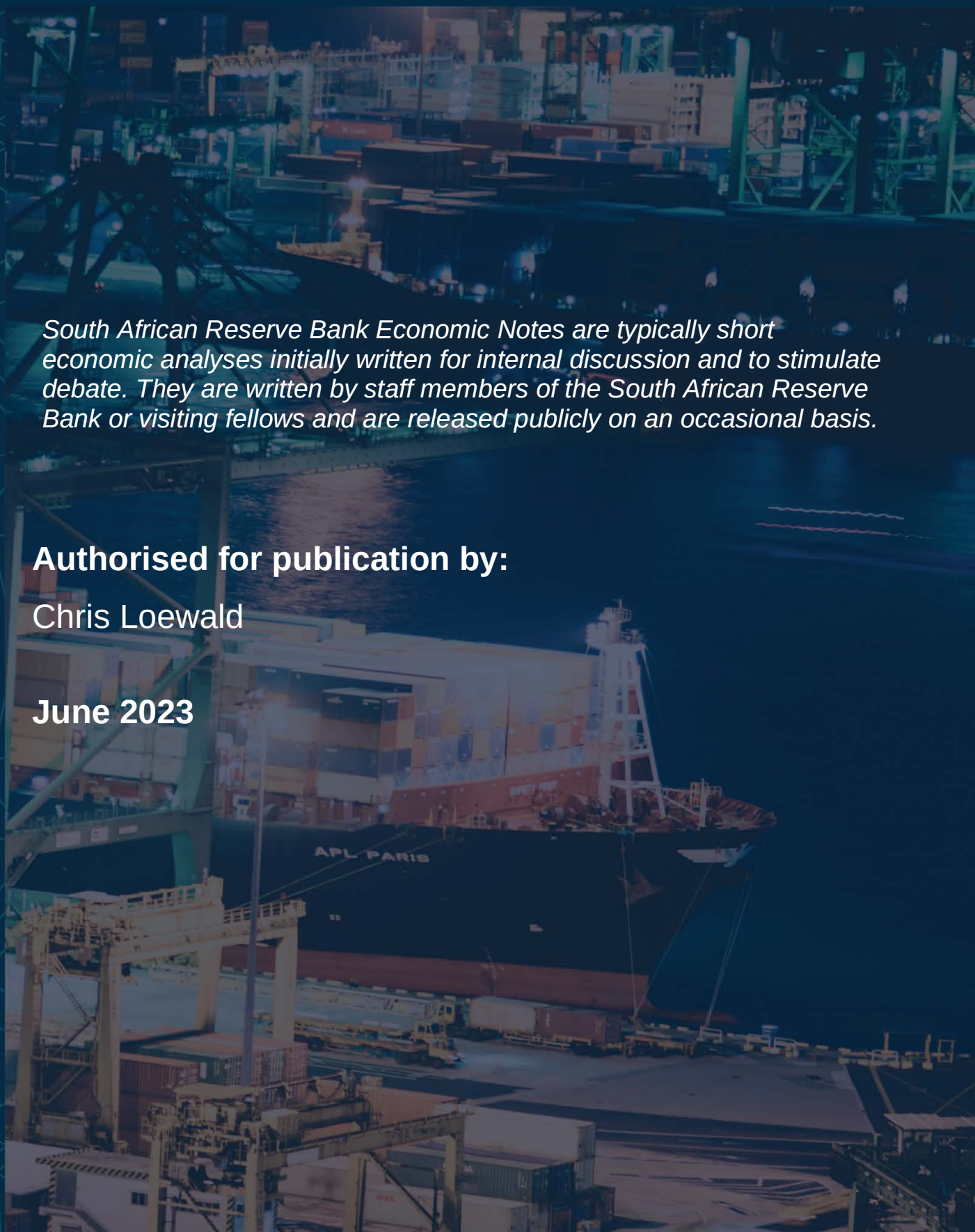
SOUTH AFRICAN RESERVE BANK



South African Reserve Bank Economic Notes are typically short economic analyses initially written for internal discussion and to stimulate debate. They are written by staff members of the South African Reserve Bank or visiting fellows and are released publicly on an occasional basis.

Authorised for publication by:

Chris Loewald

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Enquiries
Head: Research Department
South African Reserve Bank
P O Box 427
Pretoria 0001

Tel. no.: +27 12 313-3911
0861 12 SARB (0861 12 7272)

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Quo vadis, r-star?

Jean-François Mercier

Abstract

Economists generally agreed that neutral real interest rates (r*) had declined in the decades preceding the Covid-19 crisis, in both advanced and emerging economies. However, analyses differed as to the drivers of that decline. While past pandemics generally tended to depress neutral rates, policy responses and low mortality among the active population limited the direct impact of Covid-19 on r*, at least in major economies. Beyond Covid-19, trends in other drivers of neutral rates (demographics, potential growth, public debt) suggest that r* should remain low in coming years. However, r* may not be declining further and could even edge up modestly in the short term. That said, the latest supply shocks have increased challenges in measuring short-term changes to r*. Hence, central banks may place less focus on r* in the near term, at least until the current inflation shock has abated.

1. Introduction

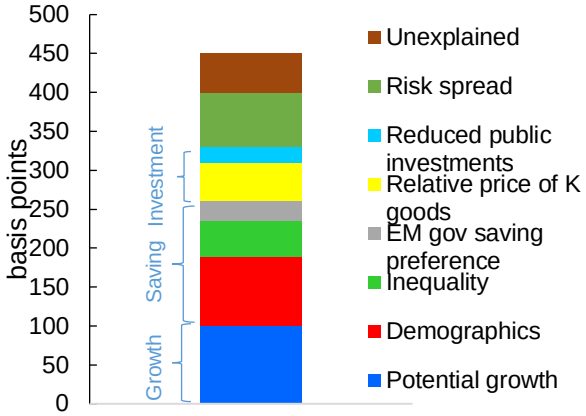
The concept of a neutral real rate of interest (r-star, or r*) has become an integral part of monetary policy calibration amid the generalization of inflation targeting (IT) regimes. By providing indications (albeit imprecise ones) about the interest rate level consistent with neutral monetary policy, it allows policymakers and investors alike to assess the policy stance, and project the most likely rate path under specific macroeconomic projections. It is central to Taylor rule-type estimates of optimal policy.

Prior to the pandemic, a broad consensus prevailed that r* had declined in most economies over the past few decades. However, the multiple shocks caused by the Covid-19 pandemic and related lockdowns have made estimating and projecting r* more difficult. This Note, after reviewing the key drivers of r* pre-pandemic as identified in the literature, analyses potential changes in these drivers in coming years, either directly or indirectly related to Covid-19. It then looks at whether r* remains as relevant as before 2020 for monetary policy, both internationally and in South Africa.

2. R* before the pandemic – theory and evidence

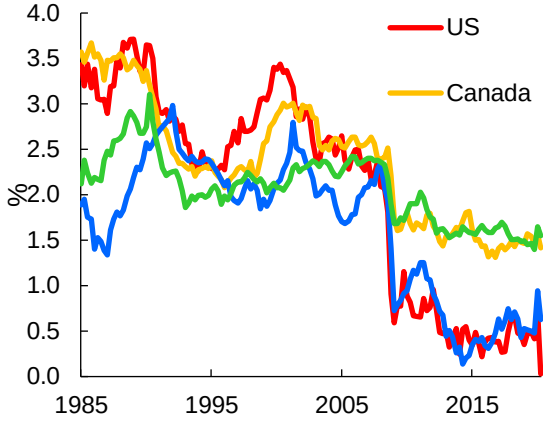
The concept of r* dates back to Wicksell's (1898) theory of the natural interest rate, an unobservable variable consistent with output equalling its potential and constant inflation. With money being seen as neutral in the long run, most theories have postulated that r* will reflect real economic drivers of ex-ante savings and investment demand. This includes demographics (a falling dependency ratio, or rising life expectancy would tend to raise desired savings), inequality (wealthier households typically save a higher share of their income), potential GDP growth and the relative price of capital goods (both being positively correlated with rising investment intentions). Furthermore, in a world of open capital markets with limited investor home bias, global (rather than domestic) saving and investment intentions would drive a country's r*, resulting in cross-country correlation and convergence of neutral rates.

Figure 1: Contributions to 1980-2015 decline in r*



Source: Rachel and Smith (2015)

Figure 2: Estimates of r* in four major economies, 1985-2020



Source: Holston, Laubach and Williams

Such theory has informed econometric estimations of r*, which have all pointed to a sustained decline in past decades. Rachel and Smith (2015) estimated that neutral real rates declined by about 450bps since the early 1980s across advanced economies (AE) and emerging market (EM) economies, with slower potential growth accounting for about 100bp and the remainder being explained by demographics, inequality, falling relative prices of capital goods or a rising spread between the average return on capital and the risk-free rate (Figure 1). Estimates of the decline in r* based on the HLW methodology (Holston, Laubach and Williams, 2017) showed a somewhat smaller but still substantial decline across four major economies (Figure 2).[1] However, uncertainty around the estimates for r* is high.

Other research, while not disputing a decline in neutral rates, contests its size or the role of relative drivers. For example, Gagnon et al. (2016) estimate that r* declined by a smaller amount (as the 1980s was very much an outlier with unusually high real rates) and that demographics explain most of that decline.

[1] The HLW approach uses an IS function relating the output gap to the interest rate gap, a Phillips curve linking inflation changes to the output gap, and a Kalman-type filter to estimate potential GDP and hence the output gap.

Finally, Borio et al. (2017) dispute the assumption that money is neutral in the long run. They argue that standard real economic variables used to estimate r* lose their explanatory power when including decades prior to 1980, and that the role of changing monetary regimes was incorrectly ignored. In their view, the decline in r* may mostly reflect a normalization from high real rates needed to fight the 1970s Great Inflation, an asymmetric response to financial booms and busts, and central bank difficulties in pushing inflation back up to target in the 2010s.

3. How far did the pandemic affect demographics?

The last two and half years, however, have seen a multiplicity of shocks (the pandemic, lockdowns, reflationary policies and the inflation surge) with the potential to alter equilibrium economic variables, including r*. Typically, pandemics result in a higher capital/labour ratio – as workers die but physical capital is left intact – thus lowering returns on capital. They also raise the need for precautionary savings.[2] Both factors reduce the neutral rate.[3] Jordà, Singh and Taylor (2020) look at a sample of 19 major pandemics and wars since the 14th century, and observe that pandemics (in contrast to wars, which also destroy capital) have a negative impact on r*, which peaks on average after 20 years, at 150bp.

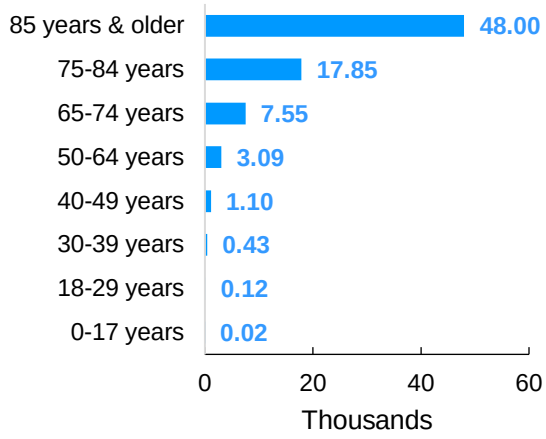
Covid-19 is estimated to have killed about 6.8 million people globally,[4] but it was perhaps not a "typical" pandemic: In contrast to earlier episodes, including the 1918 Spanish Flu, it disproportionally affected retirees, at least in advanced economies like the United States (Figure 3). Equally, the size of government transfers to households in 2020-21 should have reduced the need for precautionary savings. Nevertheless, even with limited mortality in the working-age group, Covid-19 may end up having long-term consequences on workforce participation, either via chronic illness limiting the ability to work, or by making some employees involved in "contact jobs" reluctant to return to work altogether. Goda and Soltas (2022) estimated that long Covid may have reduced the US workforce by at least 500,000 (0.2% of the adult population), and indeed older worker participation has yet to recover (Figure 4). But this observation is not valid everywhere: Botelho and Weissler (2022) do not observe unusual rates of early retirement in the euro area.

2 Specifically, the risk that the main breadwinner(s) in a household may die from the pandemic can entice the build-up of precautionary savings.

3 Inversely, the relative scarcity of labour versus capital implies real wages rise after a pandemic, and indeed this happened in the decades following the "Black Death" plague pandemic of the 14th century.

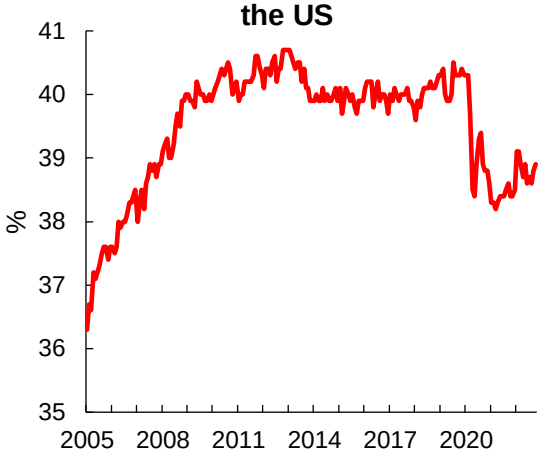
4 The figure is derived from worldometers.info and does not include recent unofficial estimates for China.

Figure 3: Covid-19 deaths per million in the US



Source: Center for Diseases Control (as of 4 January 2023)

Figure 4: Workforce participation among the 55+ in the US



Source: Bureau of Labor Statistics

4. Possible indirect effects of the Covid-19 shock

Beyond its direct impact on demographics and precautionary savings, the pandemic (and its aftermath) may have durably affected fundamental r* drivers. One uncertainty relates to long-term potential GDP growth: Declines in fixed investment during lockdowns may weaken productivity gains, while disruptions to schooling (especially in emerging countries) probably undermined future human capital growth. This would suggest lower potential growth going forward, though higher investments in ICT during the pandemic – as firms adapted to new ways of work – could have played an offsetting role. The jury is still out about the medium-term growth outlook, which can be used as a proxy for institutions' view on potential growth: The IMF has lowered its expectations for EMs, though not AEs, compared to just before the pandemic (Figure 5).

Government transfers to households during the pandemic, and the boost to asset prices (housing and financial assets) probably increased both wealth and income inequality, a driver of lower r*.[5] But the current broad-based monetary policy tightening, to deal with a global inflation surge, is starting to erode wealth gains. In addition, households may become more reluctant to save if expecting that inflation will be higher and more volatile than before the pandemic, as returns become more uncertain. The impact of higher inflation on saving, however, is unclear: For example, household saving rates were high in France and Italy in the high-inflation 1970s-80s, maybe a sign that households were saving even more to compensate for the risk of real wealth erosion and unexpected variance in real income.[6] But the 2021-22 inflation also seems to be accompanied by a stabilisation or even a rise in the relative price of capital goods, thus removing an earlier factor of downward pressure on r* (Figure 6).

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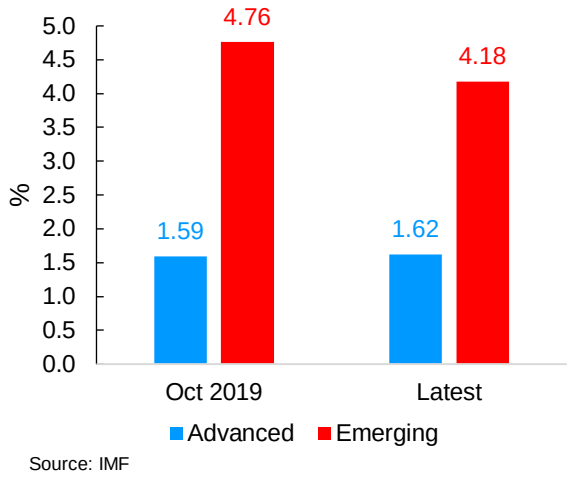
5 A survey by the Bank of England published in November 2020 showed that a majority of high- and middle-income households reported higher savings during Covid, in contrast to low-income households and the unemployed.

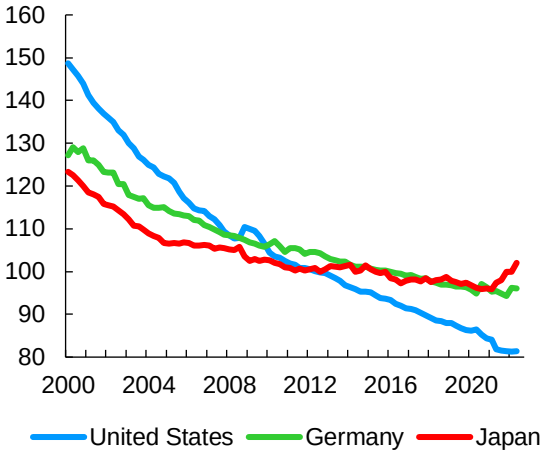
6 Howard (1978) found evidence of a negative correlation between real net liquid assets and saving in five major AEs (US, Japan, Germany, UK and Canada), as well as evidence in some of these countries of a positive link between rising inflation expectations and saving.

Figure 5: 5-year ahead GDP growth projections



Source: IMF

Figure 6: Ratio of equipment investment to GDP deflators



Policy-wise, the response of governments to the pandemic shock, and later (in some cases) to the energy price shock, has raised structural budget deficits and is likely to worsen debt/GDP dynamics relative to pre-pandemic projections (Figure 7). To the extent that rising debt ratios, by raising the supply of safe assets, limited the decline in r* before 2020 as Rachel and Summers (2019) argued, this further deterioration could push r* higher in coming years if other drivers cancel each other out. However, even that impact is ambiguous. As Adolfsen et al. (2020) argued, rising debt ratios are likely to be accompanied by a broad deterioration in sovereign ratings, meaning that while the overall supply of government bonds will rise, that of truly "safe" assets (highly rated bonds) may not.

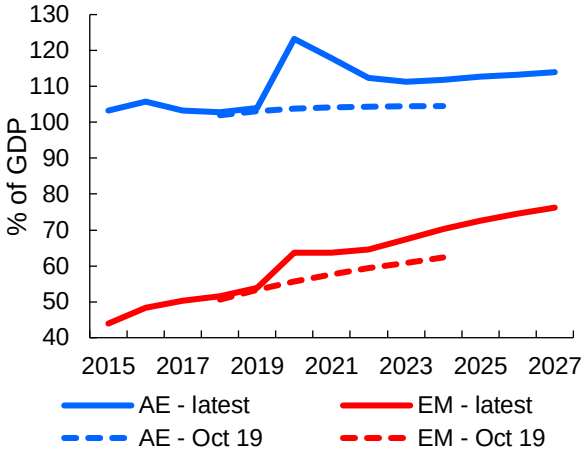
Finally, if one subscribes to the view that money is not neutral for r*, and that neutral rates were unusually depressed in the 2010s by private-sector deleveraging, quantitative easing (QE) policies and difficulties central banks experienced in lifting inflation up to target, then the current inflation spike – to the extent that it forces central banks to err on the side of tightness for an extended period and downsize balance-sheets – could raise r*. Neutral rates could end up moderately higher than pre-pandemic levels at least in the short term, and until inflation has stabilized again.

5. Consensus evolving towards mildly higher r* short term?

Both academics and private forecasters have been reluctant to pronounce on the outlook for r* post-pandemic. Holston, Laubach and Williams have not updated their estimates since early 2020, citing challenges in using filter equations to determine potential output. The IMF has also highlighted the higher-than-usual uncertainty surrounding r* estimates, though it suggested in the October World Economic Outlook that it may have risen somewhat in the US. IMF Deputy Managing Director Gita Gopinath (2022) recently indicated that the pandemic may not have made lasting changes to longer-term drivers of r*. These would encompass downside pressure from precautionary savings and inequality, upside from public debt trends and climate investments, and more neutral effects from demographics, as ageing societies

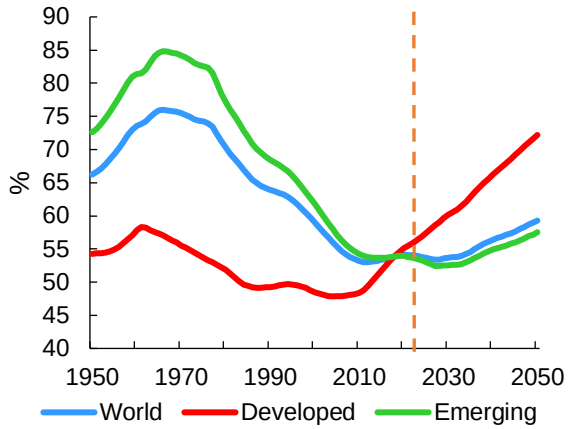
stop the decline in the dependency ratio (Figure 8). Over the longer run (say, 10 to 15 years) there is however a risk that rising old-age dependency raises r*, if as Goodhart and Pradhan (2017) argue, as ageing populations reduce desired savings by more than they curb desired investment.

Figure 7: Debt projections before and after Covid



Source: IMF

Figure 8: Past and projected dependency ratios



Source: United Nations

Major central banks have equally been reluctant to indicate changes in their neutral rate views, though they flag uncertainty as higher than usual. In the US, the FOMC's median forecast for long-term Fed funds – a proxy for nominal r* – has changed little since 2020 (Figure 9). The ECB does not publish such an estimate for the Eurozone, but Bank of France Governor François Villeroy de Galhau last year indicated he still saw nominal r* around 1.0%-2.0%.[7]

Furthermore, economists increasingly distinguish between longer-term r* (driven solely by slow-changing variables such as demographics and technical progress) and shorter-term measures, influenced by supply and financial shocks. Some consensus is emerging that the latter probably fell during the pandemic but has since rebounded, to slightly above pre-pandemic levels. Deutsche Bank (2022) estimates that it may now be around 0.7%-0.9% in the US, versus 0.5% pre-pandemic. UBS (2022) holds similar views.

6. The case of neutral rates in EM

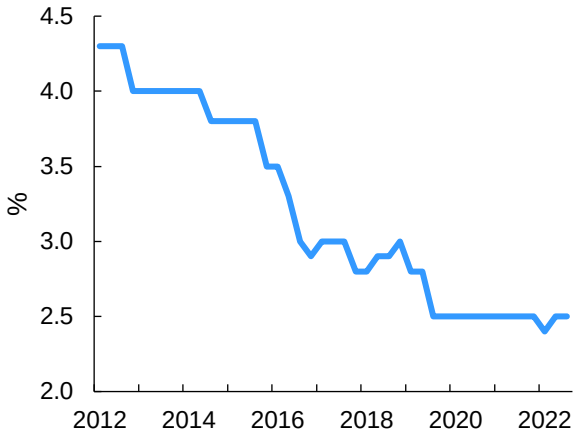
Most of the literature on r* refers to AEs. Still, several studies had identified a downtrend in r* in most EM regions over the past decades, that intensified following the Global Financial Crisis (GFC) but may have stalled in the late 2010s. The gap between r* in AE and EM was believed to have declined significantly over time. Amid growing trade and financial integration of EM, economists argued that global drivers of saving and investment intentions had become increasingly relevant for r* in EM, and that reduced global risk premia (together with greater domestic policy credibility) contributed to a narrower EM-AE neutral rate spread.

[7] Statements from some fellow Governing Council members also suggested that they are broadly in agreement. See "Is there room for the ECB to maintain its pace of hiking?", Europe Blog, Deutsche Bank Economic Research, 26 October 2022.

Recently, Ruch (2021) estimated that average EM r* co-moved with US r*, but fell faster, from 6.2% in 2000 to 2.2% in 2019. He also observed that slower potential growth only explained a small part of the decline, but that global savings and inequality provided no significant explanation – potentially a sign of key roles played by policy credibility and global risk appetite.

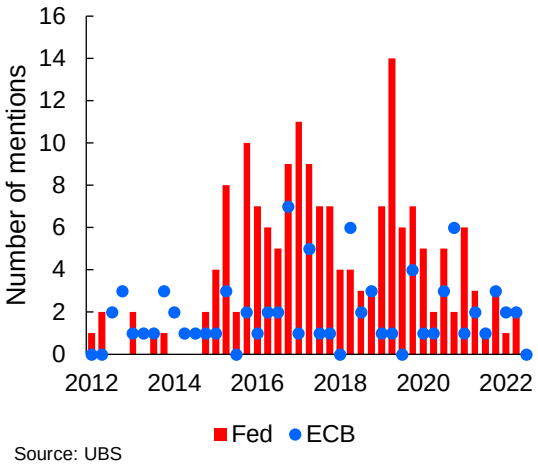
Consequently, to the extent that EMs remain globally financially integrated, world drivers of r* should continue to influence EM neutral rates. Looking at EM Asia, Tanaka et al. (2021) argue that long-term drivers of r* should reassert themselves once the effects of the pandemic have subsided, and that many of them (demographics, lower productivity gains) should keep r* relatively low. But in other EM regions that are structural capital importers, any sustained rise in global risk aversion and/or inflation expectations could easily raise the risk component of r*. Furthermore, were public and political pushback against globalization to result in a world that is financially more fragmented, the role of global drivers in driving specific-country r* might fade, resulting in a local r* that is both more volatile and less connected to AE r* levels than in the pre-pandemic years.

Figure 9: Median long-term FOMC projection of Fed funds



Source: US Federal Reserve

Figure 10: Mentions of r* in Fed/ECB speeches



Source: UBS

7. Has r* become less relevant for central banks?

As mentioned above, central banks have not pronounced on whether neutral rates have changed post-pandemic. But they have also reduced their reference to the concept altogether. UBS (op. cit.) shows that references to r* in Fed speeches have dropped a lot since 2019, whereas they remained infrequent in ECB communication (Figure 10). So, does this mean that r* has suddenly become less relevant for monetary policymaking?

Central banks are aware that successive supply shocks make it harder to estimate unobservable variables like potential GDP, and hence r*. More generally, they may feel that while drivers of long-term, steady-state neutral rates have not changed much, supply shocks have made short-term drivers, and thus estimates, of r* more volatile.

Central banks are also aware of growing criticism of models that assume stability of inflation expectations around the target – and imply, therefore, that the nominal neutral policy rate equals r* plus the inflation target. If inflation expectations prove sensitive to shocks, they introduce an additional degree of uncertainty (and volatility) to the nominal neutral rate. Consequently, central banks will be wary about providing too much forward guidance and communicating too clearly where the "terminal rate" in the cycle stands.[8] Similarly, the Fed and some of its peers want to see an extended period of restrictive financial conditions to curb inflation; hence, they are reluctant to speak too early about a return to neutral as this would encourage financial markets to rally on anticipation of a pivot. Once inflation is on a sustained downtrend and central banks grow more confident about inflation expectations stabilizing, they may again mention r* more frequently.

8. Implications for South Africa

South Africa being a relatively open economy, with a current account generally in deficit, theory suggests that its neutral rate should reflect both global drivers and the country's risk premium (as a fraction of foreign savings is required to fund domestic investment needs). Indeed, Kuhn et al. (2019) found that South Africa's r* fell post-GFC, but that the rise in the risk premium had halted that decline by 2016-17. The SARB's Quarterly Projection Model, which sets r* as the sum of weighted average G3 r* plus an equilibrium risk premium and the change in the equilibrium REER, showed a similar pattern, with a mild rise in r* in recent years. Looking ahead, while the global component may not move much, the risk is that a higher risk premium (were policy issues to remain unresolved) could drive domestic r* upwards. This highlights the importance for South Africa of having a credible fiscal stabilization path, and well-anchored inflation expectations, if it seeks to avoid structurally higher real interest rates even as potential growth remains weak.

9. Conclusion

The impact of the pandemic on neutral rates remains uncertain at this stage. Long-term drivers of r* may not have changed much, implying that it will remain largely unchanged in advanced economies. But for now, central banks would be wary of flagging an impending return to low average real rates (which they do not see as warranted), for fear of appearing complacent in their fight against the current inflation spike. For a similar reason, EM central banks should strive to keep inflation expectations anchored and limit risk premia in their domestic financial assets, as setbacks could again raise the gap between domestic and AE neutral rates.

[8] In a webinar hosted by Market News International on 7 September, Cleveland Fed President Loretta Mester indicated that the then level of Fed funds (2.25%-2.50%) could be construed as neutral if inflation was behaving normally; but she immediately added that the latter condition did not apply.

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