GLOBAL ECONOMICS FOCUS

Government debt sustainability back under the spotlight

- **Shifts in the long-term outlook for interest rates relative to GDP growth have left the fiscal position in most developed economies looking more precarious. Unless governments manage to reduce their sizeable primary deficits, market concerns about public sector debt sustainability are likely to grow, potentially pushing some countries back towards financial repression to keep interest rates artificially low.**
- Over the past decade or two, the fall in bond yields to very low rates relative to nominal GDP growth meant that developed economies were able to keep government debt to GDP ratios stable, even while running small primary deficits. **This negative interest-growth differential (so-called "r-g") was widely expected to persist indefinitely, meaning that worries about high levels of public sector debt all but vanished.**
- **Yet this differential is now set to narrow and, in some cases, disappear altogether.** In part, this reflects the rise in equilibrium interest rates that we discussed in a recent in-depth series. Admittedly, some of this rise will be driven by stronger economic growth, with no net impact on debt dynamics. But some will be driven by a shift in the balance of desired savings and investment, meaning that equilibrium interest rates close most of their gap with potential GDP growth, with adverse implications for debt ratios. This is set to be exacerbated by a rise in term premia on government debt, in part reflecting quantitative tightening.
- **On its own, this is not a disastrous development.** In most cases, it means countries will simply have to run a broadly balanced primary budget. **However, it comes against the backdrop of a big widening in primary deficits in recent years. Accordingly, it increases the pressure on the governments to rein in these deficits.**
- At least governments should get a helping hand in cutting their primary deficits from the positive impact on the public finances from the AI revolution. Working against this, however, is the long-term pressure on the public finances from ageing populations and the costs of the net zero transition.
- **Italy looks particularly vulnerable to a re-emergence of fiscal concerns.** But the recent rise in risk premia in the US suggests that tolerance is waning even of countries which historically had more leeway in the markets. For the first time in decades, we could see concerns emerge about Japan's high debt level.
- **We are not expecting an imminent debt crisis in any country.** However, if serious stresses do start to appear in government bond markets, countries may be forced into an abrupt fiscal consolidation or could use financial repression to push interest rates back down, perhaps including bringing quantitative tightening to a premature end.

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Government debt sustainability back under the spotlight

The very low level of interest rates relative to GDP growth seen for most of the past decade meant that concerns about the sustainability of public sector debt ratios in developed markets (DMs) largely disappeared. But the rise in bond yields earlier this year has brought debt worries back onto the agenda. (See here.) One key aspect of this relates to whether rising equilibrium real interest rates threaten to knock the previously favourable debt dynamics off course. In this *Focus* we discuss the fiscal consequences of rising real rates for the major developed markets and look at where the risks might be greatest. (For our work on fiscal risks in emerging markets, see here.)

The framework

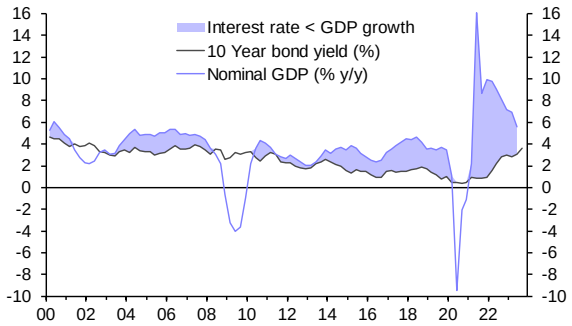
First things first, let us get straight the mechanics of debt sustainability. Setting out this framework upfront will make the discussion in the rest of this *Focus* a lot clearer.

The long-term trajectory of the debt to GDP ratio hinges on two elements. The first is the cost of servicing the debt already built up. The second is any additional borrowing i.e. the size of the primary budget.[1] Let us assume for now that the primary budget is kept in balance. (We return to this assumption later). Then the debt dynamics hinge on the debt servicing costs.

Suppose that nominal interest rates on government debt are higher than the rate of nominal GDP growth (r-g>0). Then debt servicing costs and the overall level of debt will keep rising as a share of GDP. Moreover, the higher the initial debt ratio, the bigger the primary budget surplus needs to be if a government wants to offset the rising interest costs and keep the debt ratio stable. **If instead interest rates are lower than GDP growth (r-g<0), then debt will rise at a slower rate than GDP and, over time, the debt to GDP ratio will shrink.**

In the years leading up to the pandemic, interest rates on new government borrowing fell significantly below GDP growth, as the fall in interest rates outweighed the underlying slowdown in growth. This is shown in Chart 1 for the major developed economies, using the 10-year government bond yield to represent the interest rate on new borrowing. The shaded areas show that for most of the time, bond yields were below nominal GDP growth and so what we might call "marginal r-g" was negative.

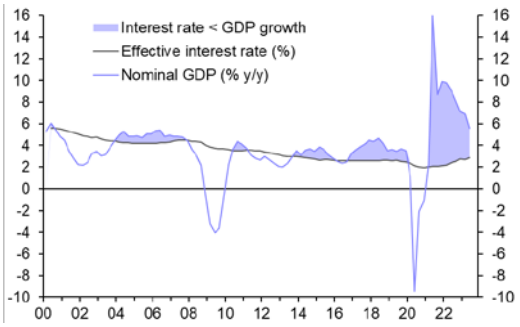
Chart 1: Marginal r-g for Major DMs*



Sources: Refinitiv, Capital Economics. * US, Canada, UK, Australia, Japan, euro-zone, Sweden, Norway

Given that much of government debt is issued at fixed rates, it took time for the falls in bond yields on new borrowing to feed through fully to the *effective* interest rate (i.e. the average interest rate actually paid by government, as measured by interest payments relative to debt). But as more debt matured, so the "effective r-g" fell too. (See Chart 2.)

Chart 2: Effective r-g for Major DMs



Sources: Refinitiv, Capital Economics

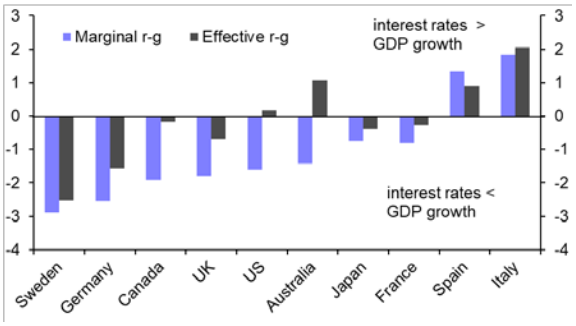
[1] The evolution of debt as a share of GDP can be summarised by:

$$D_t/Y_t = (1+r)D_{t-1}/(1+g)Y_{t-1} + b_t$$

where D_t is government debt at time t, Y_t is GDP at time t, r is the nominal interest rate, g is the nominal growth rate of GDP and b_t is the primary budget balance as a share of GDP at time t.

Most major DMs benefited from this favourable development, with Sweden and Germany enjoying the largest negative r-g differential. (See Chart 3.) The exceptions were Spain and Italy, reflecting their combination of weaker GDP growth and higher risk premia.

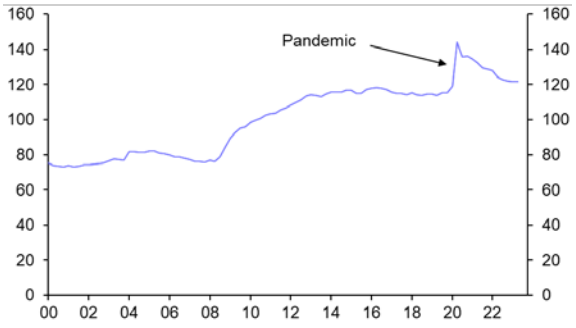
Chart 3: r-g by country (%, average 2010-2019)



Sources: Refinitiv, Capital Economics

The longer the negative r-g differential lasted, the more it was expected to persist indefinitely. Accordingly, the belief gradually gained ground that high levels of government debt were not a problem. This meant that there was little reaction even when pandemic-related support pushed up government debt ratios sharply. (See Chart 4).

Chart 4: DM Government Debt as a % of GDP



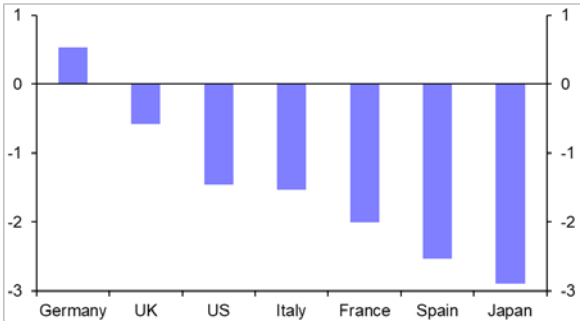
Sources: Refinitiv, Capital Economics

Box: Recent developments in an historical context

It is not unusual for risk-free rates to be below GDP growth (whereas risk premia mean that *rates of return* tend to be *above* rates of economic growth.) Academics have put together historical datasets which show that risk-free rates have been typically lower than the growth rate over the past few decades and centuries. Reasons for this include periods of unexpected inflation; flights to safety during periods of financial turbulence; and a tendency for governments to use financial repression (such as capital controls or interest rate caps) to force market interest rates artificially lower.

A study by Mauro et al. showed that the r-g differential for DMs averaged -2.4% between 1800 and 2018, with a negative gap for 61% of the time. (See here.) The longest periods of negative gaps were seen in Japan and the US. Long-term data on risk-free interest rates between 1870 and 2010 compiled by Jorda et al. show a similar picture. (See here.) On average over that period, r-g was negative for all the major economies except for Germany; and Japan had the biggest negative differential. (See Chart 5.)

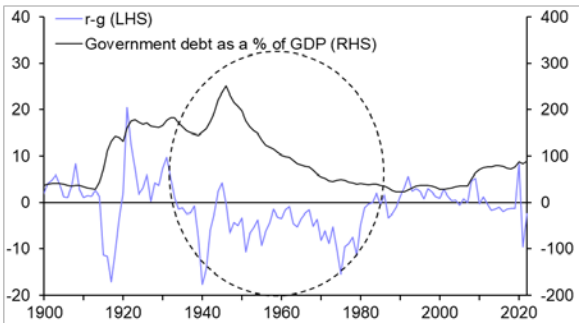
Chart 5: r-g (%, 1987-2010)



Sources: Refinitiv, Capital Economics. *Effective interest rate

Chart 6 shows the long-run picture for the UK, with the circled area highlighting the period from 1940 to 1980 when r-g was especially low, averaging -5.7%. This was largely due to the use of financial repression, including credit ceilings and special deposit schemes. Partly as a result, government debt as a share of GDP fell from 251% in 1946 to 39% by 1979. The recent period of negative r-g looks tame in comparison; indeed, it has not been enough to bring down debt ratios.

Chart 6: UK effective r-g



Source: OBR

Factors going into reverse

However, the widely held belief that this negative differential would persist indefinitely is now looking too optimistic.

To explain why, let us briefly discuss the two key factors behind the recent period of r<g. The first is the dramatic reduction in equilibrium real interest rates or r* (the rate that balances planned investment and desired saving in an economy at full employment). These rates were typically estimated at around 3% on average in DMs in the 1990s but had fallen to about 0.5% by the pandemic. Some of this decline reflected a slowdown in the rate of potential GDP growth, which pushed down both r and g. But the decline in equilibrium real interest rates has been steeper than that in potential GDP growth, reflecting factors such as the impact on saving of ageing populations, financial market regulation, and shareholders' desire for short-term returns.

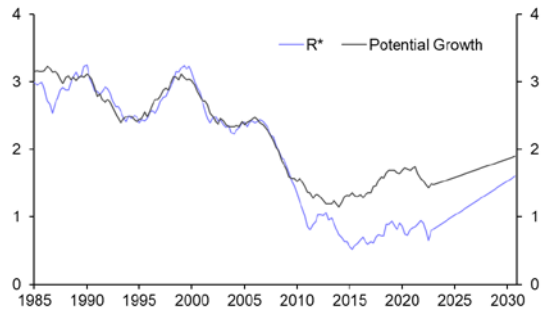
The second factor is a familiar tale in the history of r-g, namely the adoption of financial repression by policymakers. This has squeezed term premia (the part of long-term bond yields that is not explained simply by expectations for future policy rates). In recent years, this financial repression has taken the form of quantitative easing (QE) and more stringent requirements for banks to hold low-risk assets including government bonds.

But now these factors are now going into reverse. For a start, as we have argued in a recent research series, several of the structural forces which have weighed on equilibrium interest rates over the past two decades are easing. (See here.)

To the extent that this is being driven by a recovery in potential GDP growth, this is not a problem for public sector debt dynamics, as it will raise *both* r *and* g. The AI revolution, in particular, will push up productivity growth and raise both GDP growth and equilibrium interest rates.

But we also think that various factors will shift the balance of desired savings and investment in favour of investment, prompting equilibrium interest rates to drift closer to the rate of potential GDP growth over time. (See Chart 7.) Opportunities in AI and the green transition will offer strong incentives for companies to invest. And persistently large government deficits mean that governments will be soaking up more private savings. (Note there is some circularity here; if large deficits push up r* and make debt less sustainable, then governments may reduce the size of their deficits which will pull r* back down. Moreover, any fiscal tightening will create scope for central banks to leave actual interest rates below the equilibrium rate.)

Chart 7: R* & Potential GDP growth in Advanced Economies (%)

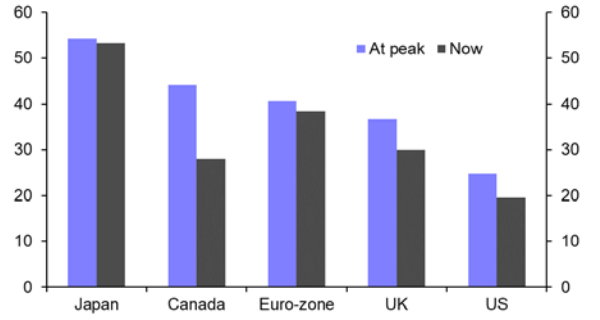


Sources: Holston, Laubach and Williams, OECD, Capital Economics

There are a lot of uncertainties in all this. But for what it's worth, we expect equilibrium real interest rates in DMs to rise to between 1.5% and 2% in the US by the end of this decade and to between 1% and 1.5% in the UK and euro-zone. Around half of this is due to stronger potential GDP growth (which will push up both r and g) and half is due to other factors (which will squeeze the r-g differential).

At the same time, rising term premia are also likely to lift bond yields relative to GDP growth. This will partly reflect quantitative tightening (QT). At their peak, central banks held 25% to 55% of outstanding government bonds. Some central banks (most notably Canada) have already divested much of this, but there is still a long way to go. (See Chart 8.)

Chart 8: Central Banks' Holdings of Government Bonds (% of All Government Bonds)



Source: Capital Economics

Admittedly, there is no simple relationship between QE/QT and bond yields. And if QT did start to spark a disorderly rise in bond yields, then central banks would ease off their divestments. (See here.) Nonetheless, central banks generally purchased bonds with the intention of pushing down their yields. So, it stands to reason that QT has the reverse effect, with the term premium being the main channel through which QT affects yields.

This could be exacerbated by a softening in several other sources of steady demand for "safe" bonds, including foreign investor demand. (See here.) Yield differentials between the US and elsewhere are smaller than they once were in many cases. Indeed, probably reflecting a combination of all these factors, term premia appear to have risen in recent weeks.

The outlook for r-g

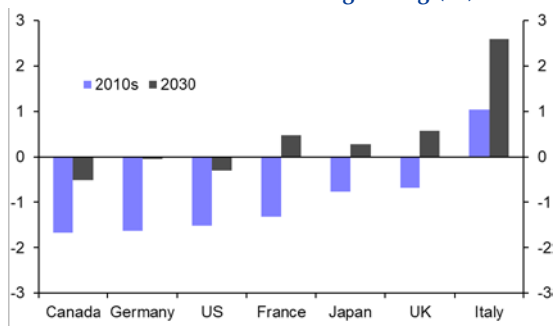
The upshot is that we expect the gap between r and g to narrow quite significantly.

In the US, for example, we expect real equilibrium interest rates to rise to between 1.5% and 2% over the next decade. If we add on inflation of 2% to 2.5%, and a term premium of 0.5%, we get nominal bond yields of 4% to 5% by 2030. While we expect potential GDP growth to rise a bit to 4.5% to 5%, that will nonetheless leave the level of bond yields and rate of GDP growth fairly close to each other.

Chart 9 shows how we expect r-g differentials to evolve. We show marginal r-g in 2030, when bond yields reach a peak, compared to the 2010s. (We expect marginal r-g to come back down a bit after 2030, as bond yields level out but AI continues to push up GDP growth.)

In Canada, Germany and the US, a negative r-g differential will remain, but it will be smaller than in recent years. In France, Japan and the UK, r will switch from being below g to above it. In Italy, r was already above g and this gap will widen further.

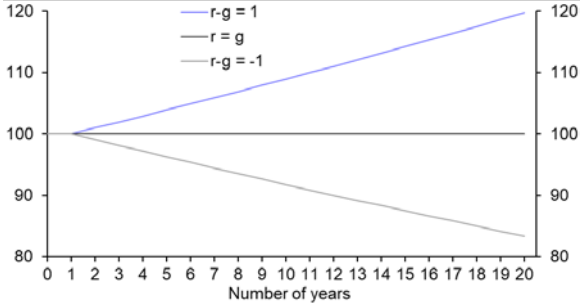
Chart 9: Forecast of Marginal r-g (%)



Source: Capital Economics

The changes in Chart 9 might not look like much, but it takes only small changes in interest rates relative to GDP growth to alter debt dynamics substantially. Chart 10 shows a stylised example (assuming an initial debt ratio of 100%, a balanced primary budget and annual nominal GDP growth of 5%). If economic growth exceeds interest rates by 1pp, the debt ratio will shrink after two decades to almost 80%. Yet if interest rates *exceed* economic growth by 1pp, the debt ratio will grow substantially further after two decades to 120%.

Chart 10: Stylised Example of Government Debt as a % of GDP (Assuming Primary Budget is Balanced)



Source: Capital Economics

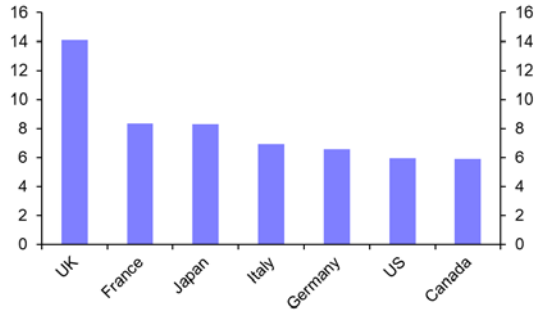
Not an imminent problem

At least government finances are unlikely to be impacted immediately by all of this.

One reason is that we expect the r-g differential to narrow only gradually over the next decade or two. Most of the factors affecting equilibrium interest rates are slow-acting structural factors that play out over decades, rather than months or years.

The other reason is that the majority of government debt was issued at a fixed rate and so, until that debt matures, governments will enjoy the benefits of the low interest rates they locked into in the past. Chart 11 shows the average (mean) maturity of government debt is generally between 6 and 8 years, and in the UK is some 14 years.

Chart 11: Average Term to Maturity of Government Debt (Years)



Source: IMF

Admittedly, Chart 11 paints an overly sanguine picture, for a couple of reasons. First, the mean is skewed by a tail of very long-dated debt. One way around this is to look at the median maturity instead i.e. the year in which half of the outstanding public sector debt would be impacted by a change in interest rates. We have calculated this for those countries with available debt maturity schedules. (See Table 1.) Whereas the mean maturity of government debt in the UK is 14 years, the median is 8.5 years. In the US, the mean maturity is 6 years, but the median is just 1.5 years, reflecting the fact that it issues a high proportion of short-dated debt. So the pass-through of higher interest rates will be much quicker than the mean maturity suggests.

Table 1: Average Government Debt Maturity (Years)

	Mean	Median
UK	14.1	8.5
US	5.9	1.5
France	8.5	6
Japan	8.3	5.8
Italy	6.9	5

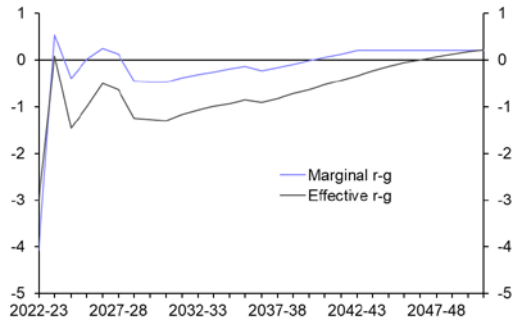
Sources: IMF, National Treasury Departments, Capital Economics

And second, standard measures of maturity fail to account for the impact of QE. From the point of view of the consolidated public sector balance sheet, QE has effectively retired long-term government debt from the market and replaced it with interest-bearing central bank reserves which, in terms of interest rate sensitivity, act like debt that needs to be refinanced every day.[2] That means the impact of higher interest rates will feed through faster than before. Adjusting for the impact of QE, the median maturity of debt in the UK, for example, falls from 8.5 years to just two years. Of course, this effect will reverse as government bond purchases are reversed under QT, but that process is likely to take several years.

Notwithstanding these couple of points, the big picture remains that higher interest rates will affect government debt servicing interest costs only gradually. We can see that in the CBO's projections, where it takes until 2032 for the recent rise in the 10-year yield to fully feed through to the effective interest rate on government debt. Meanwhile, Chart 12 shows how it plays out for the UK. Like us, the OBR expects the marginal r-g differential on new borrowing to shrink, but this happens only gradually, and it takes several years longer for the effective differential on outstanding debt fully to follow suit.

[2] Different central banks have different arrangements for sharing both past QE-related profits and future losses with their national treasuries. (See here.) But this is irrelevant when thinking about the public sector as a whole, which includes the central bank as it is ultimately backstopped by the government. Note that the impact of higher interest rates on interest payments could be reduced if, as some have suggested, central banks moved to a system of tiered interest on reserves. However, this would effectively act as a tax on banks and so might affect the resilience of the banking system and the supply of credit.

Chart 12: UK r-g (%)



Source: OBR

Implications for primary deficits

Eventually, though, these effects will all feed through. And they have important implications for the size of primary balances (i.e. borrowing excluding interest payments) that governments are able to run if they want to avoid putting government debt as a share of GDP on an indefinite upward trajectory.

Table 2 provides a ready reckoner for how the size of the r-g differential affects the size of the primary balance consistent with a stable debt ratio. The top half of the table shows the primary deficit that governments can run when interest rates are below GDP growth. For example, a differential of 1pp would allow an economy with a starting debt to GDP ratio of 100% to run an annual primary deficit of 1% of GDP (i.e., a primary balance of -1%).

The bottom half of the table shows the size of *surplus* that governments need to run to keep the debt ratio stable when interest rates are *above* GDP growth. For example, a country with a starting debt to GDP ratio of 100% and an r-g differential of 2pp needs to run a primary surplus equal to 2% of GDP per annum. **Note that the higher the initial debt ratio, the bigger the primary surplus needs to be as a share of GDP to keep the debt ratio constant.** In other words, countries with higher debt ratios need to run faster just to stand still.

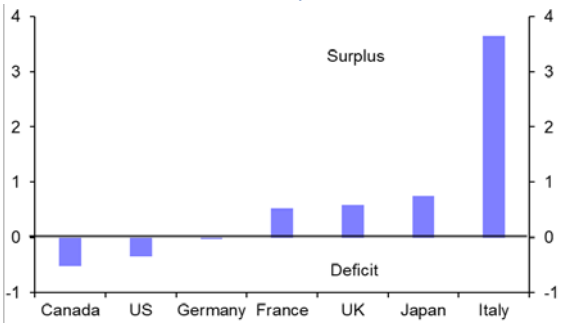
Table 2: Primary Balance As a % of GDP Required to Stabilise the Debt Ratio* (Red – deficit, Blue - surplus)

		GDP growth minus interest rates		
		1pp	2pp	3pp
Starting debt to GDP ratio	100%	-1.0	-1.9	-2.9
	150%	-1.4	-2.9	-4.3
	200%	-1.9	-3.8	-5.7
		Interest rates minus GDP growth		
		1pp	2pp	3pp
Starting debt to GDP ratio	100%	1.0	1.9	2.9
	150%	1.4	2.9	4.3
	200%	1.9	3.8	5.7

Sources: IMF, Capital Economics. *Based on 5% nominal GDP growth.

Following on from this, the blue bars in Chart 13 shows the primary balances that would be consistent with a stable debt ratio given i) the starting level of debt to GDP ratio, which we take to be the 2023 level and ii) our forecast for r-g in 2030 shown in Chart 9. Some countries (Canada, the US and Germany) would still be able to run a small primary deficit, but only of less than 0.5% of GDP. Meanwhile, France, the UK, Japan and Italy would all need to run primary surpluses, with Italy needing to run one equivalent to some 4% or so of GDP.

Chart 13: Government Primary Balance (As a of % GDP)



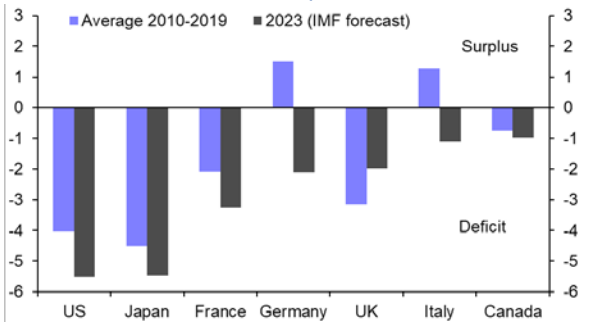
Source: Capital Economics

Keeping the primary balance broadly close to zero, as would be required for most countries, may not be difficult for countries whose deficits are back down to low levels, notably Canada. (See the black bars in Chart 14.) **However, it is a much taller order in the US, in particular, where the primary deficit is set to run at almost 6% this year** - even though economic growth has been quite resilient this year and most pandemic-related effects have washed through by now. Meanwhile, Italy has tended to run primary surpluses, but smaller ones than would be required

to maintain a stable ratio once r-g has risen further as we expect.

Governments generally do plan to reduce their primary deficits over the next couple of years, but whether they achieve this is another matter. After all, they also ran significant deficits in the decade running up to the pandemic. (See the blue bars in Chart 14.) In the US and Japan, the primary deficit averaged between 4% and 5% of GDP, while in the UK it averaged just over 3% of GDP.

Chart 14: Government Primary Balance (As a % of GDP)

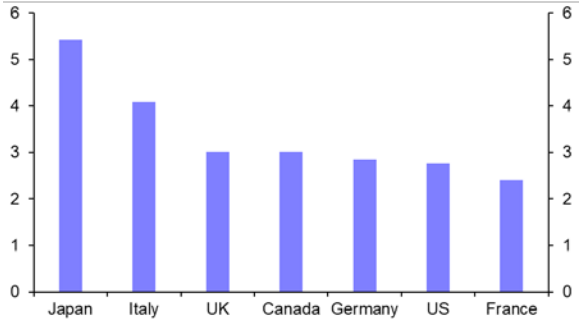


Source: Capital Economics

At least governments may get a helping hand from the AI revolution. This could come about partly via a boost to productivity growth; if we are right in expecting AI to boost economic growth without any rise in technological unemployment, then tax revenues are likely to rise by more than government spending. And to the extent that AI prompts a shift in the pre-tax income distribution towards those paying higher tax rates, it would boost tax intensity too. (See here.) Indeed, it is notable that the US in the 1990s saw a swing from a primary deficit to a big primary surplus, partly due to fiscal consolidation but partly due to the ICT-related economic boom. (See our forthcoming *US Economics Focus*.)

Working against this, however, is the growing pressure on public finances from ageing populations and the transition to net zero. Chart 15 shows that age-related fiscal costs (due to health, long-term care and pension expenditure) by 2060 will rise by the equivalent of 2.5% to 5.5% of GDP, depending on the country.

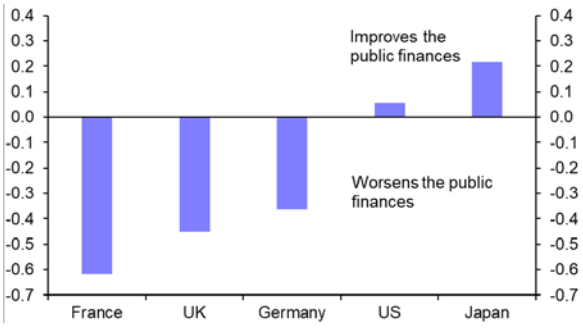
Chart 15: Rise in Age-related Expenditure By 2060 (As a % of Potential GDP)



Source: OECD

Meanwhile, Chart 16 shows IMF estimates of the fiscal cost of reaching net zero, including the erosion of the fuel tax base and compensation for households required to make changes. The impact is biggest for France (0.6% of GDP on the primary balance by 2040). In the US and Japan, the impact is cushioned by the greater opportunity to tax emissions. **Accordingly, a narrowing r-g differential puts pressure on a deficit that already has little room for manoeuvre over the long-term.**

Chart 16: Effect on 2040 Primary Balance of Reaching Net Zero



Source: Capital Economics

The end-game

If governments fail to get a grip on their primary deficits, then market concerns will grow. There is a risk of a vicious cycle developing, whereby concerns about the debt outlook push up risk premia on government debt, raise interest costs and worsen the debt outlook further. **Perceptions can be as important as reality.** There can be "multiple equilibria"; a level of debt can be both sustainable (if markets remain relaxed and risk premia and yields remain low) and unsustainable (if markets get worried and interest rates rise). (See here.)

In the extreme, this can all end in default. Admittedly, most countries can avoid this, as they can print their own currency and stand behind their bond markets. Nonetheless, **the consequences of a reduction in market confidence can still be pretty bad.** The surge in government borrowing costs spills over into higher borrowing costs for households and businesses too, crowding out private consumer spending and investment.

Suppose that stresses do start to appear in government bond markets in any of these countries. What would governments do? **One option would be to get interest rates back down relative to GDP growth by using financial repression. In current circumstances, that is most likely to mean central banks easing back on QT or even resuming QE again.** Some central banks might move towards some form of yield curve control (or re-instate it in the case of Japan). **This would take us into the realms of fiscal dominance**; which occurs when the central bank's need to hold interest rates low to keep the government's borrowing costs manageable compromises its ability to control inflation. (See here.) Indeed, financial repression is not some costless solution.

These options would not necessarily be available for euro-zone countries, given they are not individually in charge of their own monetary policy. Accordingly, they would be reliant on, for example, the ECB changing the issuer limits of its PEPP to affect individual country markets. Note, too that, Italy has a history of calling in technical governments to implement austerity if there is a high risk of a fiscal crisis and we think this will remain a viable option in the future. **Indeed, a government that shies away from getting a firmer grip on its public finances in the near term might just have to enact a more abrupt fiscal tightening further ahead if financial markets force its hand.**

Where are fiscal risks greatest?

So where are worries about fiscal risk most likely to manifest themselves?

Financial markets are likely to be most forgiving of countries that can print their own currency and stand behind their bond markets. The obvious example is the US, but this group also includes the UK and Canada. **That said, events of recent weeks have suggested that markets have a limited tolerance even in the case of the US**; credit default swap premia (a useful, if imperfect, proxy for perceptions of fiscal risk), have been creeping up. Indeed, even though the risk of outright default is low for those economies, that still leaves the possibility of "default" by other means, including by financial repression or inflation.

Countries where political and institutional constraints limit room for manoeuvre are most vulnerable. The obvious examples are the euro-zone countries, where being part of a monetary union without full fiscal union puts more of a straightjacket on governments. **Accordingly, concerns about Italy could well be the first to re-emerge.** (See here.)

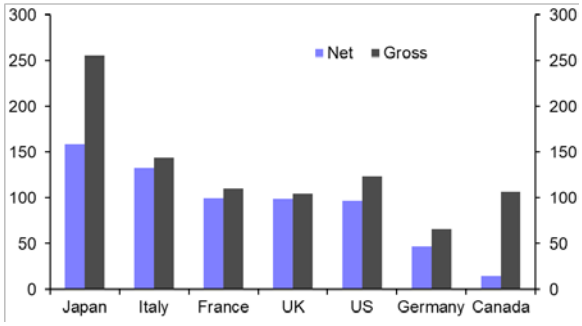
Italy's bond yields will come under upward pressure from the global rise in equilibrium interest rates, while Italian risk premia are likely to be higher than in the past. Yet at the same time, Italy will find it harder than most other economies to exploit the potential economic gains from the AI revolution. And for various reasons, the structural reforms connected to the NextGenerationEU are unlikely to materially to improve Italy's business environment. (See here.)

Although the Italian fiscal position tends to attract the most attention in the euro-zone, France is a potential flashpoint too. At 110% of GDP, France's government debt as a share of GDP is lower than in Italy and it is unlikely to become a major concern for investors in the near term. However, the debt ratio is still high relative to the euro-zone average, and France runs a much larger primary deficit that Italy. Also, although France did increase its retirement age earlier this year, the protests against this change, and the opposition in parliament, highlight the barriers it needs to overcome if it is to put in place the structural policies required to deal with an ageing population. What's more, it is likely that future governments will be less committed to fiscal consolidation than President Macron's administration.

The UK is clearly at risk too. The sell-off in the bond market in September 2022 in reaction to Prime Minister Liz Truss's change of fiscal tack shows how sensitive markets are to perceived changes in the UK government's fiscal discipline.

We might see concerns also start to surface about Japan, given its demographic outlook will make it hard for Japan to keep a lid on its primary borrowing. Until now Japan has not been seen as a problem; in fact, its government bond yields have been at rock bottom levels even though Japan has by far the highest government debt level of any advanced economy. (See Chart 17.)

Chart 17: General Government Net Debt (As a % of GDP)



Source: Capital Economics

Of course, ultimately Japan can print its own currency. And it benefits from its high domestic savings rate which soaks up the government's bond issuance. **However, the sheer size of Japan's debt suggests we should not be complacent about potential fiscal problems there.**

Conclusions

We are not forecasting an imminent fiscal crisis in any country. The unfavourable change in debt dynamics will take time to come through. And some countries can tolerate a poorer debt outlook anyway.

However, the recent rise in bond yields has put government debt sustainability back under the spotlight. **And even if bond yields fall back further in the near-term, the deterioration in longer-term fiscal dynamics suggest that fiscal concerns are unlikely to disappear. Governments will therefore remain under pressure to get their large deficits under control.**