Deutsche Bank
Research

Global

Strategy

Long-Term Asset Return Study

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The History and Future of Debt

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Editorial

Common wisdom suggests that the prudent upper threshold for government debt/GDP is in the range of 70-90% for high-income countries, 50-70% for euro area countries and 30-50% for the EM complex. Evidence has suggested that growth slows past these thresholds and thus risks creating an unsustainable and negative debt/GDP cycle.

Today, many countries are above these levels, with the globe seeing the highest peacetime debt in history, and yet until recently hardly a week went by without fresh record lows in bond yields. The other unusual part of this cycle is that although aggregate government debt/GDP has soared since the GFC, if you assume that the post-GFC accumulated central bank holdings never get repaid, then most governments have actually de-levered over the last decade. Do we have to rethink our view on debt sustainability or is this a big bubble?

Much depends on the future interaction between governments and central banks. In a world of stubbornly low growth and low inflation, and with populist governments increasingly looking at reversing prior fiscal consolidation/austerity, eventually the temptation to use negative/ultra-low rates to borrow to spend will prove too tempting. Indeed, at current yields, Germany could move from a surplus of c1.5-2% to a deficit of roughly the same magnitude and still keep debt/GDP constant over the next several years. This won't be easy in reality, and it's worth remembering that the German word for debt is "Schuld", the same as the word for guilt.

The multi-trillion dollar question is whether governments can successfully and consistently issue the holy grail of funding – zero-coupon perpetual bonds. If they can do that, spend the money, and central banks buy the bonds, then that is pure helicopter money. We're actually not a million miles away from this. It feels like central banks have given governments the keys to the helicopter in helping yields fall to current levels, but governments have yet to fully embrace the spending power that this may offer them. It may take the next recession to encourage the move.

Ironically, the biggest risk to a plan to borrow at low/negative rates to facilitate fiscal spending might be that it is actually successful. If inflation is generated (as it should be with such policies), then the bonds that are still 'free float' may be much more vulnerable than they are today, when markets don't believe inflation is possible and total returns are still being made by buying negative-yielding bonds. At this point, if such polices are to be maintained, we may need even more central bank buying of government bonds to keep yields down.

The key to a sustainable debt environment over the next decade(s) will be about keeping nominal yields well below nominal GDP. As such, financial repression and aggressive central bank purchases might still be in the early stages. The big difference – relative to the last decade – will likely be that governments start spending the "free" money that central banks have served up. Infrastructure (tech led) and green investment may give even the most prudent of countries the political cover to spend.

So higher debt, higher inflation, higher nominal GDP, higher yields, and higher central bank balance sheets. Bondholders beware!

Fascinating Stats on a Page

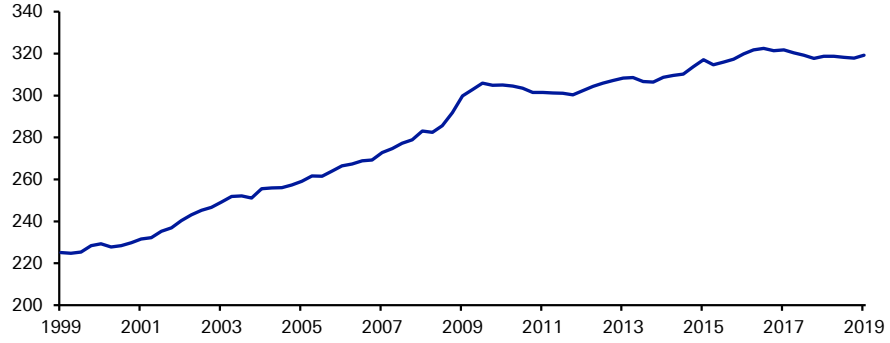
- Total global debt/GDP stood at 319% in Q1 2019, up from 225% in Q1 1999, an increase of 94 percentage points over two decades.
- Despite this rise in global debt, a near-record $15tn of debt now has a negative yield, which is 25% of the total. About 40% of government debt has a negative yield.
- Financial repression is alive and well. In a comprehensive sample of 32 of the largest DM countries, only four currently have 10yr yields above nominal GDP. Italy is still one of those four despite a major yield rally in the months before publication.
- Supporting the above, median G7 real govt yields averaged 4.05% in the nineteenth century, 1.48% in the twentieth, and 1.36% in the twenty-first so far but have collapsed to zero since mid-2012. Negative real yields (which we currently have across the board) are relatively rare through history.
- The UK has the longest global series of govt debt data. From 1689 for nearly three centuries, the UK ran a primary deficit only during wartime periods and their immediate aftermath. It wasn't until 1981 that the central government ran a primary deficit in peacetime. What is today considered normal across the globe is in fact historically unusual.
- The UK also shows that it is possible for governments to sustain high debt levels for many decades. In 1822 and 1946, the UK's national debt/GDP peaked at 194% and 259%, respectively. Indeed, after WWII many countries had debt/GDP well above 100%.
- The scale of deleveraging globally between 1945 and 1980 was massive. By a variety of means, the national debts of the UK, France, Japan, Australia and Canada all fell by over 100 percentage points.
- During this period, real bond returns in developed markets were heavily negative. Between 1946 and 1980, they were -47% in the US, -68% in the UK, -82% in France and -87% in Japan.
- Projections of future debt depend massively on assumptions of future interest rates. If current yields are maintained for years, it brings a totally different dynamic to debt sustainability. In the US, the CBO forecast that debt/GDP will rise to 144% in 2049. However, with interest rates just one percentage point lower than their LT assumptions, debt rises to just 107% and will be unchanged if Treasuries tend towards and stay at zero.
- In Germany, where debt is falling, the government could afford to turn a budget surplus of 1.5-2% into a deficit of the same magnitude and still see debt/GDP stable.
- The Federal Reserve, ECB and BoJ balance sheets now stand at 18%, 40% and 102% of GDP, respectively. They hold 13%, 28% and 46% of total government debt in their domestic markets.
- Foreign holders of global government debt as a percentage of total holdings shot up from c.5% in 1975 to over 45% since 2008. This has subsequently plateaued and if globalisation is under threat, there may be less reserves to invest in global bonds. To keep yields low, central banks may have to buy even more.

Executive Summary

This is a simplified summary of the overall report with many of the key graphs from the piece included.

In total the world has $246.5 trillion of debt, up from around $172 trillion on the eve of the GFC and 'only' $84 trillion at the start of this century. Over the same three periods, global debt/GDP has grown from 228% (2000) to 300% (2009) and then to 319% in 2019.

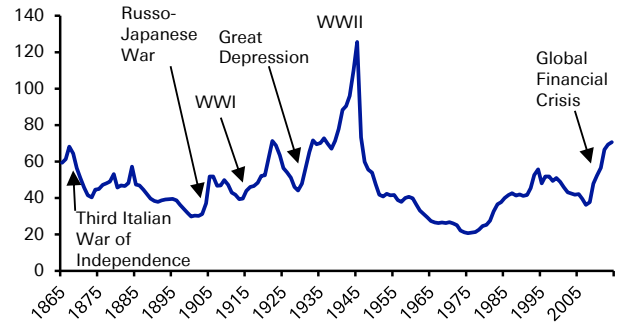
Figure 1: Total global debt/GDP (%)



Source : IIF Global Debt Monitor Database

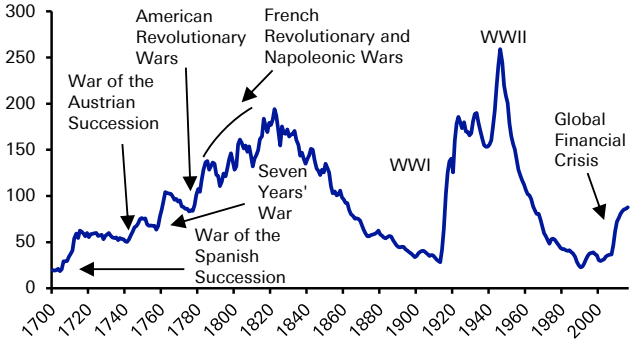
Total global debt/GDP (including non-government debt) has never been higher, but we have seen many governments carry higher debt/GDP in the past than current levels, although only around war times. Over the last few years, however, we've seen the highest peacetime levels of debt for much of the developed world.

Figure 2: Median DM Debt/GDP (12-country sample)



Source : Deutsche Bank, GFD

Figure 3: UK National Debt (% of nominal GDP), 1700-2016



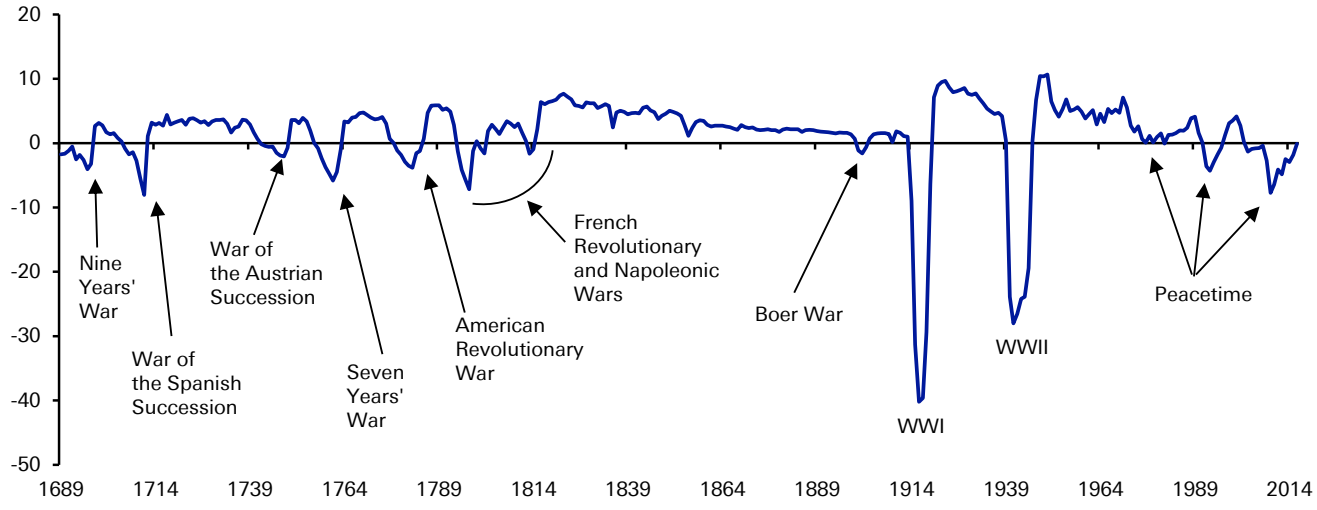
Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

The problem in the modern era is that government debt is more structural than it was in the past, when it almost exclusively financed wartime ambitions. Outside of conflicts, governments ran balanced budgets. In most countries around the world, revenues have struggled to keep up with spending in a post WWII great society/wel-

fare state movement where democracies became more prevalent and a far wider number of voters set the priorities. The debt floodgates opened after the 1971 abandonment of the gold-based Bretton Woods system, and compound deficits have been the norm since. At the start of this period, overall global debt levels were around all-time lows and governments had a 'free debt lunch' until the GFC changed the landscape. Over the same period, private sector debt has also gone from low levels to record highs. So we are now in uncharted territory with unconventional policy to support high debt levels becoming increasingly normal.

The main ways to de-lever through history have been to a) default, b) run large primary surpluses for extended periods, c) keep real yields negative or d) ensure nominal yields are well below nominal GDP. In general, it's been a combination of the above. In the current era, the first two seem completely unpalatable for the way we live and invest. Given how much debt there is and how systemic it seems to be, the authorities' desire to see wide-scale debt restructuring seems minimal at this point. The fear would be that allowing restructuring in one over-indebted entity could create fears of a domino impact elsewhere. Debt is viewed as too systemic to our economic system. It's not clear that this will change as debt piles get higher.

Figure 4: Large structural primary surpluses were a main deleveraging weapon in the past but are much more difficult to sustain in most modern democracies - UK Central Government Primary Surplus (% of GDP)

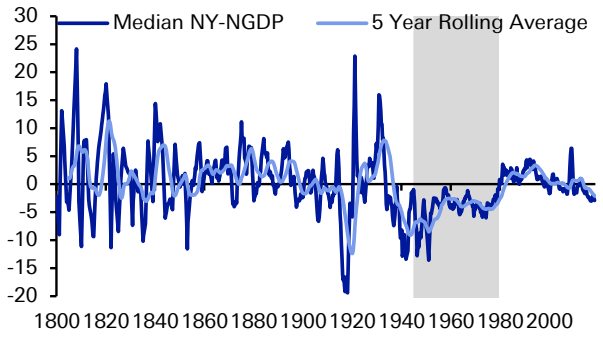


Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

Maintaining high primary surpluses for a prolonged period seems like a solution more appropriate through history than for today. Such a policy was mostly used in periods when democracy wasn't as strong as it is today or when the pressures to have a welfare state or big society weren't so prevalent. Italy is a modern-day exception, but three decades of near-continuous primary surpluses have contributed to a lack of investment in the economy, weak growth, still-rising debt, and persistent political instability culminating in the recent populist movements.

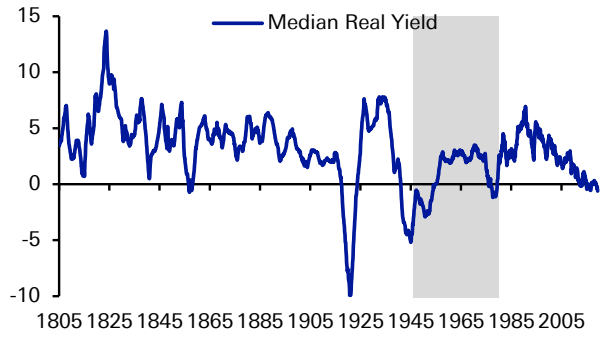
The biggest and most successful global deleveraging through history occurred between 1945 and 1980, when yields could be set significantly below nominal GDP. Real yields weren't consistently negative but saw periods where they were.

Figure 5: Global nominal yields-nominal GDP growth (15 Country Median, %)



Source : Deutsche Bank, GFD

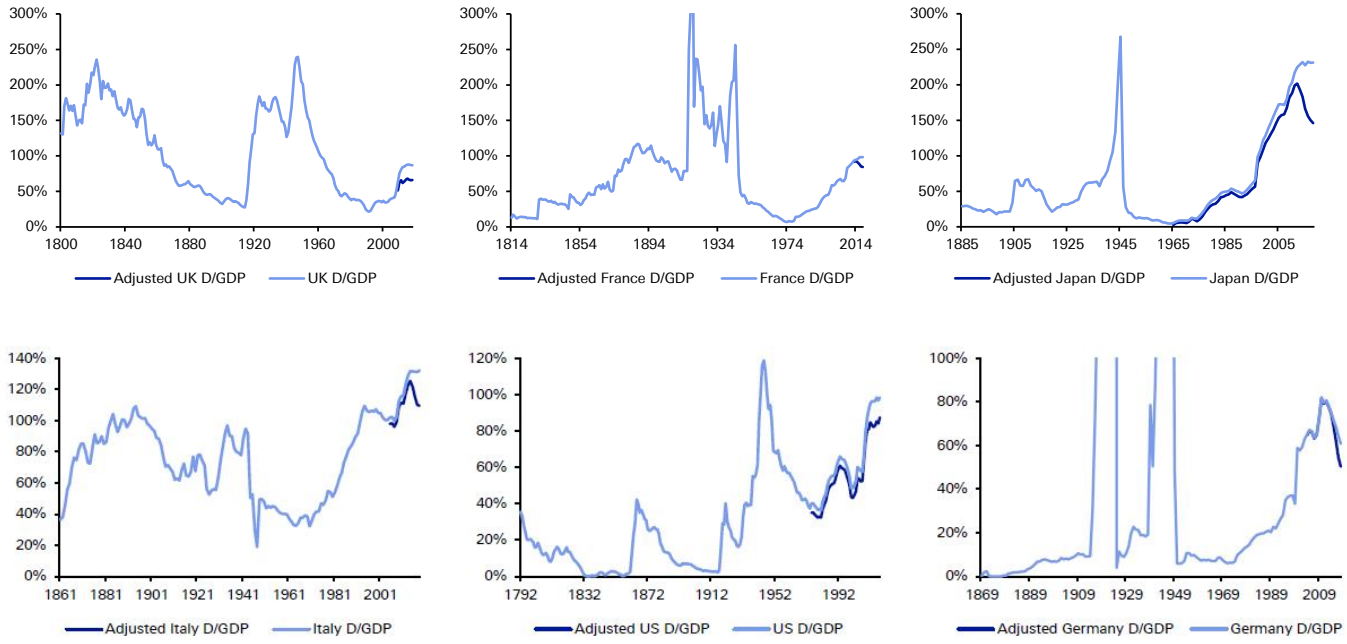
Figure 6: Global Real yields (15 country median, %)



Source : Deutsche Bank, GFD
Note: Real yields based on 5-year average inflation subtracted from nominal yields

Fast forward to the present day and we look like we've recently entered another long period in which yields will artificially be kept well below nominal GDP. In our sample of the largest 32 DM countries, only four currently have 10yr yields above NGDP. The problem in sustainably recreating such a scenario today is that the post-WWII era saw much higher levels of GDP growth due to favourable demographics, post-war reconstruction, and high productivity growth. It will be nearly impossible to manufacture a repeat of such an outcome. We will only get closer to it with significant 'artificial' fiscal and central bank interventions. Whether such central bank money printing ever gets repaid or is simply inflated away is open to debate. Already since the GFC, government debt has effectively declined in many countries if you assume QE is never repaid. But by their aggressive actions over the last decade, central banks have effectively trapped themselves into continually intervening in government bond markets. They're arguably beyond the point of no return. If the negative gap between government yields and nominal GDP is lost, then the global debt pyramid is on very shaky ground.

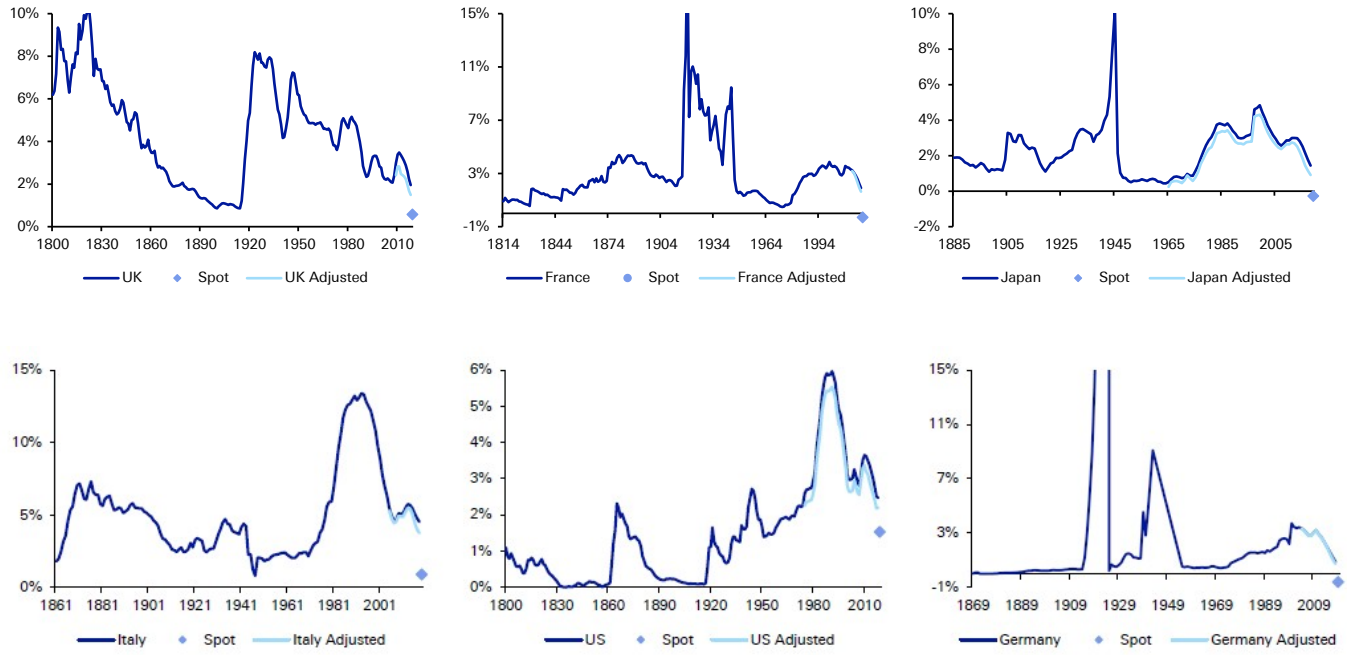
Figure 7: Government and adjusted (minus public sector QE) government debt to GDP (%)



Source : Deutsche Bank, Haver, GFD

For now, with average funding costs so low and poised to go lower still if current yields are maintained, central banks have effectively invited governments to experiment with more unconventional policies. A world of helicopter money where central banks finance government spending to stimulate growth (nominal or real) seems inevitable over the medium to longer term.

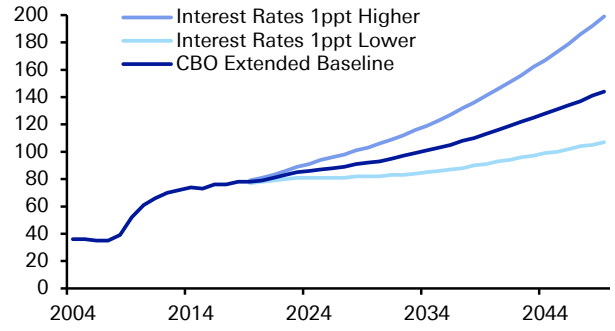
Figure 8: Average proxy funding costs (10y rolling average of 10 yr yields) as % of GDP



Source : Deutsche Bank, Haver, GFD, Bloomberg Finance LP

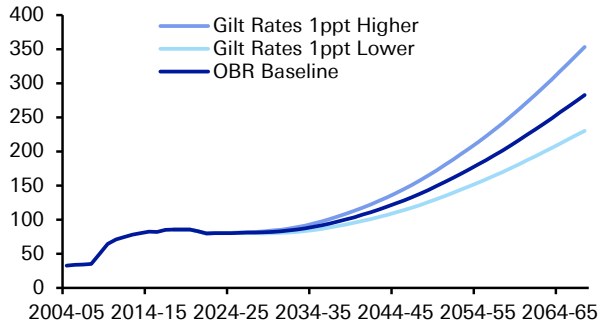
If yields can be suppressed for a long period, then debt ratios could grow at a much milder rate than official independent central-case scenarios. Even the high-spending US could stabilise debt if yields tended towards zero.

Figure 9: US Debt/GDP Forecast



Source : Deutsche Bank, CBO

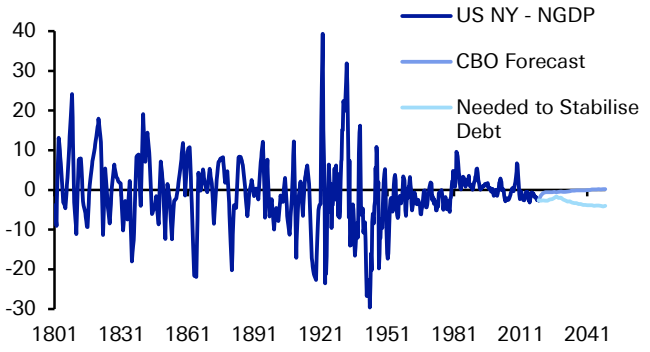
Figure 10:UK Debt/GDP Forecast



Source : Deutsche Bank, CBO

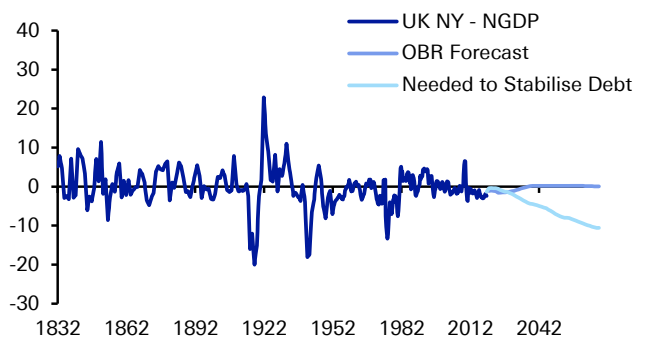
Interestingly, the level that yields need to be below nominal GDP to stabilise debt in the US is not that extreme relative to history. For the UK, yields start to get to the more extreme end of the historical range once you get past the next 20 years on current assumptions. The further out you go, the more demographics become very challenging for debt sustainability across all parts of the globe. The big problem with this financial-repression scenario is that unless nominal GDP is increased from current low levels, negative/ultra-low rates would need to be locked in for a very long period, which may be counterproductive in other ways. The best chance of successful debt/economic management is NGDP staying notably higher than yields, but with both at higher levels than at present. Inflation might be the easier route than real GDP growth to achieve this, even if less desirable.

Figure 11:US nominal yields - NGDP



Source : Deutsche Bank, GFD, CBO

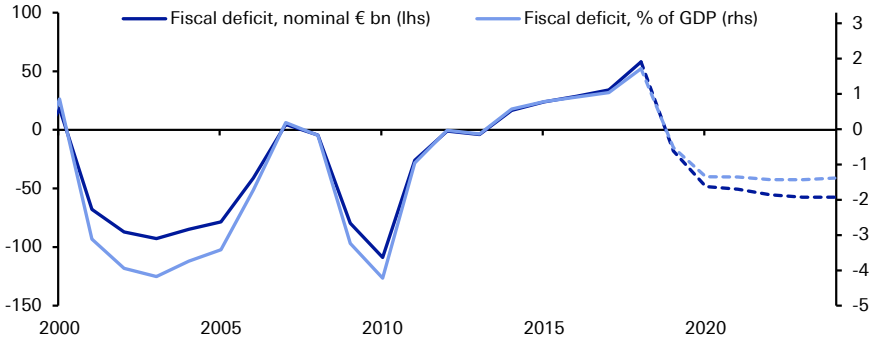
Figure 12:UK nominal yields and NGDP



Source : Deutsche Bank, GFD, OBR

Using future yield/funding assumptions, even Germany could see a 3-4% swing from surplus to deficit and still see debt/GDP remain constant. Whilst there is little political will for such a reversal, it's an illustration of what's possible with funding so attractive versus even historically low growth.

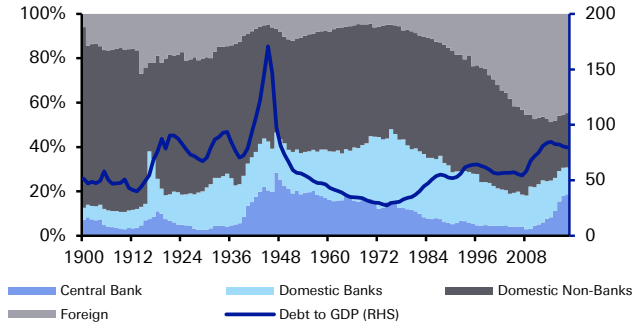
Figure 13: Under expected funding rate assumptions, Germany could see fiscal deficits of around €60 billion now or 1.5pp of GDP per year for the next several years, and it still would not result in a higher debt level



Source : IMF, Deutsche Bank Research

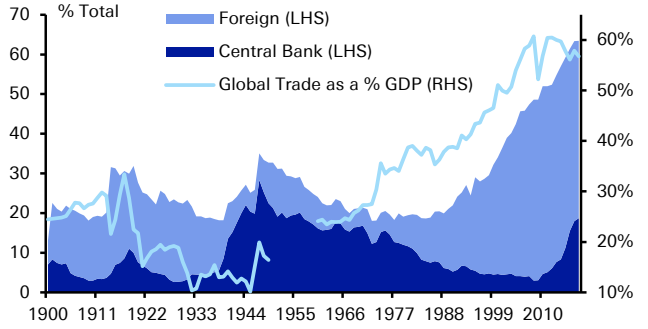
The multi-trillion dollar question is, can governments get away with keeping yields so low relative to activity? In their favour is the rapid increase over the last couple of decades in the non-price-sensitive holders of government bonds. As well as domestic central banks, the foreign sector owns an increasing amount of bonds. Much of this is due to the huge accumulation of reserves around the world, especially from EM countries. If globalisation falters, though, domestic central banks may have to intervene even more in the future to offset declining reserve flows.

Figure 14: Holdings of government debt over time



Source : Deutsche Bank, Blackrock Investment Institute, IMF

Figure 15: The foreign sector and domestic central banks own the vast majority of DM public debt.. Is foreign demand at risk if globalisation reverses?

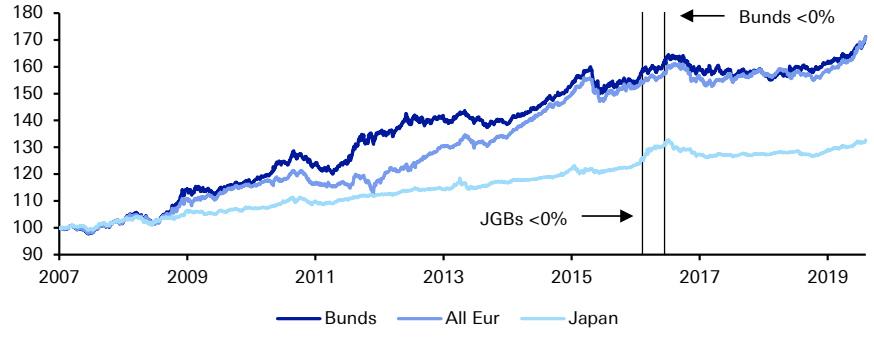


Source : Deutsche Bank, Blackrock Investment Institute, IMF

Even with more price-insensitive holders than ever before, another big risk to any positive repeat of the 1945-80 period is what happens if and when policy makers are actually successful and generate inflation. At the moment, those investors have been kept onside by extraordinary recent fixed income returns. Even since yields went negative, total returns have remained strong as investors have been able to sell to people who think yields will go even deeper into negative territory or that we're in for semi-permanent global 'Japanification'. So economic success and a free-float bondholder rebellion might be the biggest risk to this policy avenue over the next decade or so. Don't forget the huge private sector debt pile if this scenario occurs. To maintain debt sustainability and control the rise in yields when fiscal spending increases, central bank holdings of government bonds (and private sector

bonds) will likely need to climb ever higher in the years ahead.

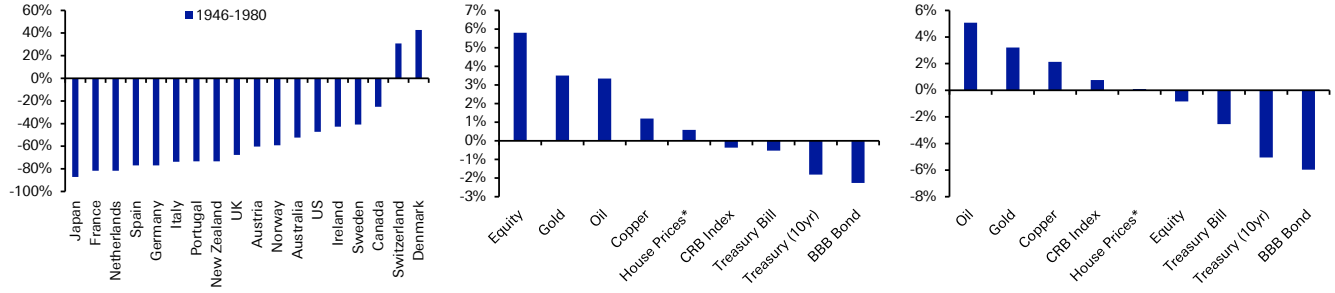
Figure 16: Total returns of Bunds, Eur Govs and JGBs since 2007



Source : Deutsche Bank, BofAML/ICE

If central bankers and governments are able to replicate some of the successes of the 1945-1980 period, there will be one big loser – bond holders. Real wealth was destroyed in this period for those invested in government bonds. Commodities could be the best future performer relative to their usual levels of return if past is prologue. Demand for alternative currencies (e.g. crypto) would clearly rise if this scenario plays out.

Figure 17: Asset returns, 1946-1980 – real government bond holding period returns (left), real US asset annualised returns (middle), real US asset annualised returns vs. long-term averages (right)



*Note: * Price only, no income*
Source : Deutsche Bank, GFD

To conclude, whether it's due to unfavourable demographics, unfunded liabilities, democracies unable to spend less than they tax or weak productivity/economic growth, it seems inevitable that government debt will continue to grow in the years ahead. At normalised interest rates, it would likely be just a matter of time before we saw a huge global debt crisis.

With yields close to zero or in negative territory across the majority of the globe, it's possible to comfortably run much higher levels of debt than past textbooks would have suggested and reduce the scale of its accumulation. With funding so easy and populism so high, the temptation will build amongst politicians towards helicopter-money policies and what amounts to even more debt. Zero-percent perpetuals do not seem too far away.

In general, though, it feels like an environment in which issuers of debt should try to fix in ultra-low, ultra-long funding, and investors – where possible – should avoid buying it.

Is that a sustainable equilibrium?

LT Returns on a Page

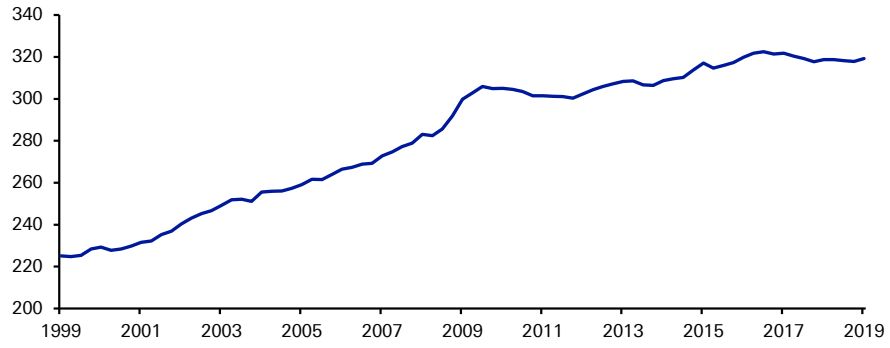
Bullets summarising the data-heavy back section of this report.

- In the US, over the last 100 years (since end 1919), where we have data for the widest selection of assets, equities have outperformed 10yr and 30yr governments by just over +4.5% p.a., corporates by +3.6% p.a. and T-bills (cash proxy) by +6.4% p.a. They have also outperformed gold by 5.5% p.a., oil by 7.5%, and US housing (prices only) by 6.1% p.a.
- In real terms, over the past 100 years, commodities have generally seen negative returns. Only gold (+1.7% p.a.) and copper (+0.03% p.a.) have seen positive real returns with the overall commodity index providing -1.3% p.a. While housing ex-rents (+1.1% p.a.) real returns have been positive, they look underwhelming compared to equities (+7.3% p.a.), 10yr Treasuries (+2.5% p.a.) and corporate bonds (+3.5% p.a.). Over recent years, assets like residential housing (to live in) and commodities have been used as a portfolio alternative to equities/bonds. History suggests that this strategy is unlikely to produce superior long-run results.
- Since 1800, US equities have had only two negative decades in nominal terms: the 1930s (-0.5% p.a.) and the 2000s (-0.9%). There have been three in real terms (1910s: -2.8%, 1970s: -1.5%, 2000s: -3.4%). In nominal terms, three of the five best decades for equities since 1800 have occurred in the last four decades (including the current decade). However, this period also included the worst decade (the 2000s).
- 10yr Treasuries and corporate bonds have never seen a negative-return decade in nominal terms, but six of the 12 decades since 1900 have seen a negative real return from Treasuries, including four successive decades from the 1940s. The last four decades have seen remarkable positive real returns for bonds – although with each decade we have seen these annualized returns decline – and as we have highlighted in this note, we can't help thinking that we're setting ourselves up for a return to a few negative-real-return decades ahead in bonds as we venture towards 2050.
- Internationally, there is a survivor bias in fixed income. The majority of the analysed countries with data back to 1900 have provided positive real returns, but there are some notable exceptions; France (-1.2% p.a.), Italy (-1.8% p.a.) and Japan (-0.6% p.a.) all saw negative real returns. Germany would be the worst if we had reliable data for the hyperinflation era. This shows that negative real returns in bonds are easily possible over even very long periods – and once they occur, they can be irreversible. With debt levels so high and yields so low, such an outcome looks likely in the future for a number of countries.
- Since the Euro was introduced (1999), there is little doubt that real equity returns in Europe have been relatively disappointing. Compared to the US and UK (+4.0% and +3.3% p.a. real adjusted, respectively) only Austria and France have outperformed, with the remainder of the Eurozone countries in our analysis underperforming the UK in real terms. Portugal (-0.6% p.a.) has failed to provide positive real returns, while Italy and Spain have seen real returns of less than +1% and Ireland has mustered only +1.3% annualised real return – worrying stats for supporters of the Euro.

A Modern World Awash in Debt

It's fair to say the world is awash in debt. In total the world has $246.5 trillion of debt, up from around $172 trillion on the eve of the GFC and 'only' $84 trillion at the start of this century. Over the same three periods, global debt/GDP has grown from 228% (2000) to 300% (2009) and then to 319% in 2019.

Figure 18: Total global debt/GDP (%)



Source : Global debt monitor database

If global debt/GDP had remained constant since 2000, we would have $66.8 trillion less debt in the world today, equivalent to 3.3 times the annual output of the US economy, or 5.0 times that of China, 13.4 times for Japan, 16.7 times that of Germany, 23.6 for the UK, 24.0 for France, or 32.3 times for Italy.

This most comprehensive data series for total global debt/ GDP goes back only to 1999. The main problem with compiling a longer-term series is that non-government debt data is hard to source before the last few decades. As you'll see shortly, we have data on government debt that goes back more than a century for a number of countries – but non-government is difficult to collate historically. So to get the fullest picture and breakdown of total global debt (public and private), we focus on the post-WWII period for this introductory chapter.

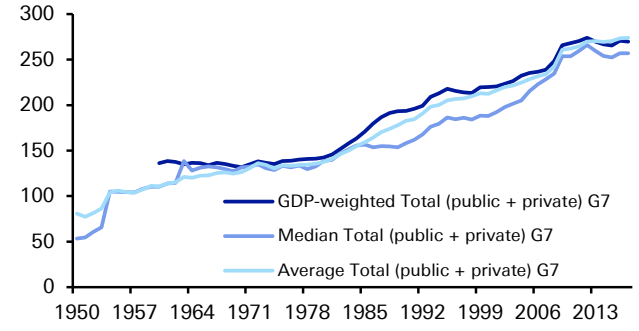
We show debt by different groupings (G7, DM and EM) and calculate non-weighted medians and averages as well as GDP-weighted levels. GDP-weighted numbers can bias the data towards very large countries, so medians/averages can better represent the general trends. Conducting this exercise across the globe is tricky as data starts from different points in history depending on the individual country, so we blend the data in from the availability date. There is also a data-definition issue for both the public and private sector, which means we make some compromises to ensure consistency of data over the sample period. So the following graphs in this section slightly understate global debt, but the series are consistent and therefore show the growth over time on a like-for-like basis. More details are in the sidenote.

For public debt the "general" government series includes fewer countries than the "central" series (68 countries versus 138) and is a less complete time series (2430 country-years versus 6392). However, "general" has two advantages: 1) it has data for China public debt, and 2) each country's debt is arguably more complete, since general government is a broader category than central government. These numbers are more consistent with the widely stated numbers for government debt/GDP. So we use "general". For private debt we use "total debt and securities" as this data stretches back to the 1950s for some of the larger countries. There is a slightly larger private debt series for all countries that includes other debt, but this begins only in 1999 and thus doesn't allow a deep historical dive into the trends.

Developed market (DM) debt history

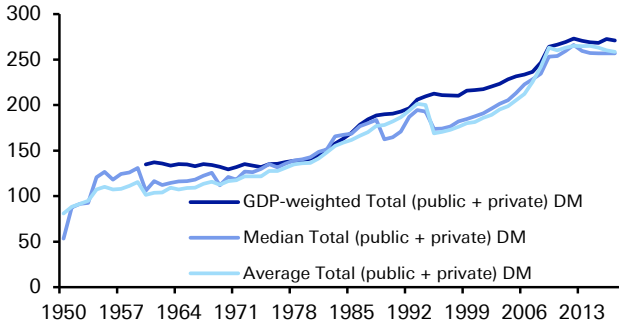
Figures Figure 19 and Figure 20 look at G7 and DM total debt to GDP and show that however you collate the data, debt has been on an upward march since the data starts in 1950. There is some evidence, though, to suggest that debt levels were broadly constant to GDP through much of the 1950s to the end of the 1970s. So the largest rise in overall debt levels has come since the 1980s.

Figure 19: G7 total debt (% GDP)



Source : Deutsche Bank, IMF

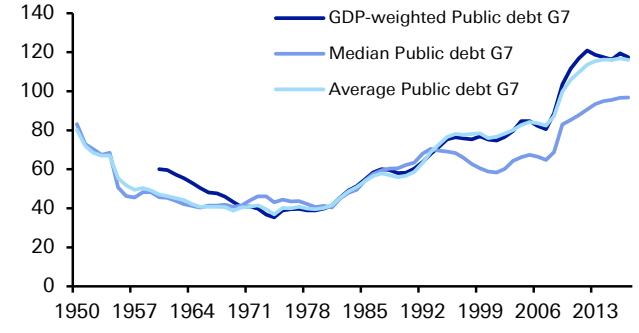
Figure 20: DM total debt (% GDP)



Source : Deutsche Bank, IMF

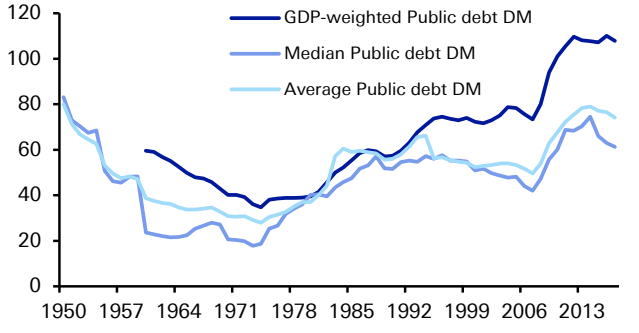
For government debt, it's a different profile as post-1950, debt/GDP declined into the late 1970s but has been rising since, especially following the GFC. We'll discuss this post-WWII trend at length in the next section. For the DM series, the lower median and average numbers show that small countries have generally seen less of a debt buildup than the largest ones. This probably reflects investor tolerance as much as anything else. The larger the country, the greater its credibility (rightly or wrongly) and ability to borrow on the international stage. Smaller countries would likely be more limited.

Figure 21: G7 public debt (% GDP)



Source : Deutsche Bank, IMF

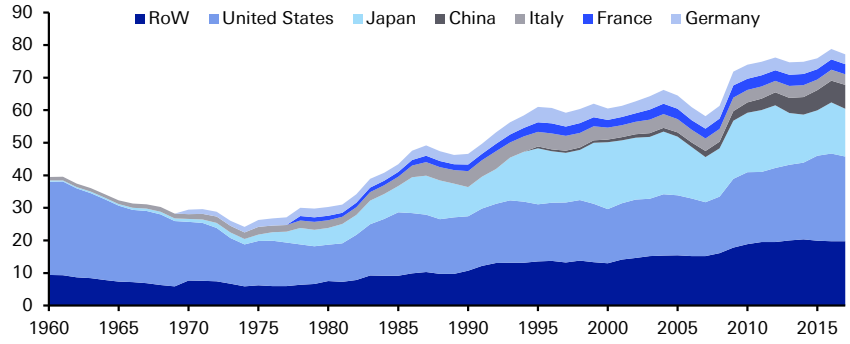
Figure 22: DM public debt (%GDP)



Source : Deutsche Bank, IMF

At a global level, the US, Japan and China make up around half of the total government debt/GDP by weighting as can be seen in Figure 23 .

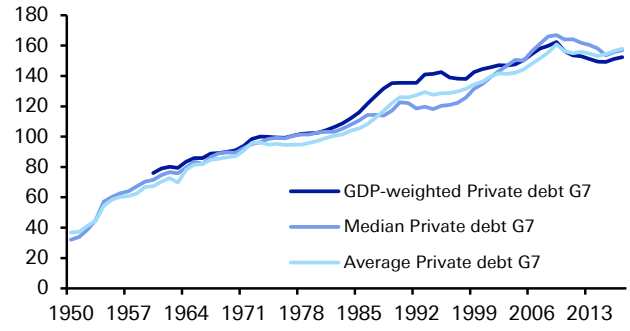
Figure 23: The US, Japan and China account for roughly half of all general public debt (% GDP)



Source : Deutsche Bank, IMF

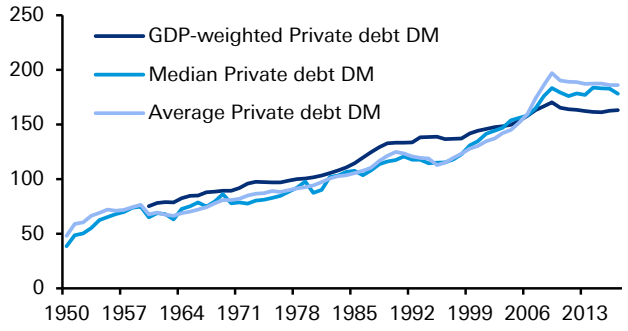
For private debt, the rise in debt has been much more consistent since the 1950s as credit availability across more and more sectors of more and more countries became increasingly prevalent.

Figure 24: G7 private debt (% GDP)



Source : Deutsche Bank, IMF

Figure 25: DM private debt (% GDP)

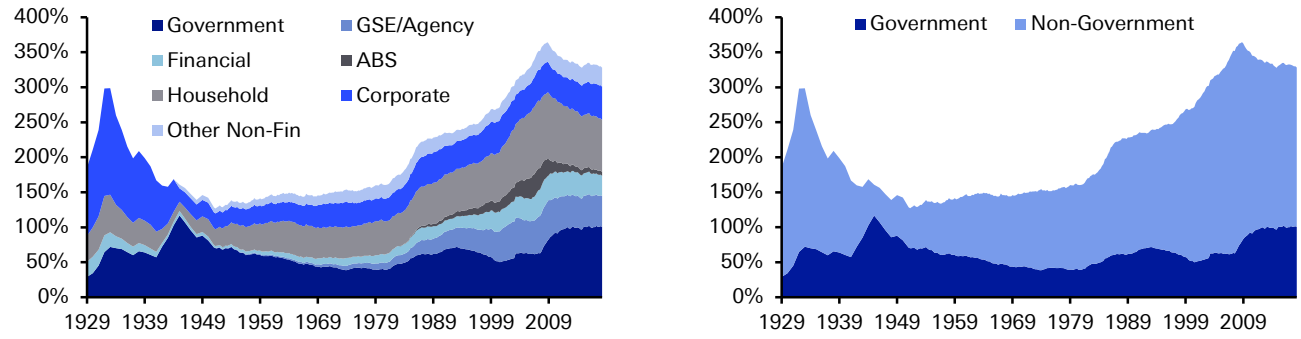


Source : Deutsche Bank, IMF

At a global level, Figures Figure 24 and Figure 25 above exhaust our database of non-government debt. To give this a wider context, Figure 26 shows the entire stock of debt for the US back to 1929. This is the only country for which we have private debt data for before 1950.

The data shows that we have seen high levels of non-government debt before, but the sharp rise in the debt/GDP ratio for the 1930s is slightly misleading as it was predominantly caused by GDP collapsing in the Great Depression rather than an increase in borrowings. There was actually a reduction in debt over the period due to default levels inevitably rising during this period. As nominal GDP recovered by the late 1930s, the non-government debt/GDP ratio was slightly lower than where it was at the start of the decade.

Figure 26: US debt to GDP by sector



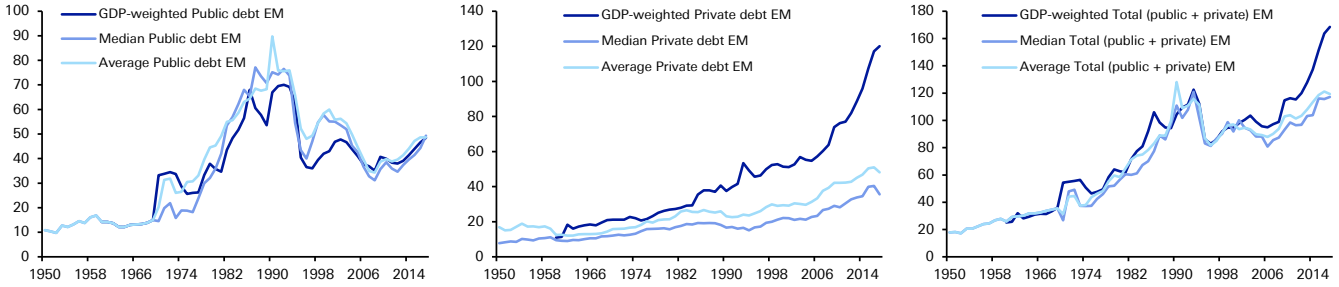
Source : Deutsche Bank, Federal Reserve

In aggregate, global private sector debt/GDP has stabilised since the GFC, albeit at historically high levels. Much of the attention in this cycle has been focused on the rise in public sector debt, but the reality is that the private sector remains heavily indebted. This may have implications for the future of public sector debt both in terms of yield levels needed to sustain the total global debt pile and in terms of the risks governments face. In subsequent crises, will governments need to stretch their balance sheets even further than official estimates expect in order to absorb private sector debt that is vulnerable to default? Although most of this report focuses on public sector debt due to its long history, we shouldn't lose sight of the record levels of private sector debt and the associated implications.

Emerging market (EM) debt history

The aggregated EM story is more complicated as the availability of data is patchier. EM also consists of many very small countries in GDP terms, so one has to be careful when representing the data.

Figure 27: EM public, private and total debt (% GDP)



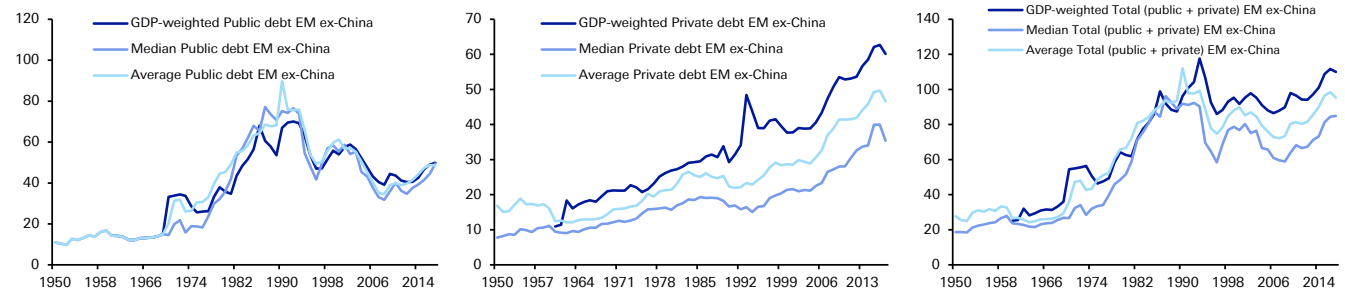
Source : Deutsche Bank, IMF

EM public debt exploded in the 1970s through the late 1980s/early 1990s as widespread DM lending occurred after the collapse of the Bretton Woods system. Capital controls were increasingly abolished, allowing massive growth in cross-border lending. Rising oil prices reinforced this by attracting lenders. This excess and unsustainable lending, alongside bad domestic EM economic management, led to widespread defaults (especially in LatAm), which reduced debt/GDP. We had another EM debt boom/bust period in the late 1990s with the Asian debt crisis, but thereafter reformed economic management and strong EM growth led to a general

government debt deleveraging through the immediate post-GFC period. Since then, debt/GDP has been on the way back up as countries respond to the new global economic realities (as with their DM cousins) and China starts to become a global force – and a sizeable accumulator of debt.

Indeed, the private debt numbers in GDP-weighted terms are heavily distorted by China's emergence from a poor country to the second-largest economy in the world as well as its voracious appetite post-GFC for private debt. Private debt/GDP elsewhere in EM has climbed much more steadily over the whole period, even if there has been some acceleration in the ratio after the late 1990s. This trend can be seen more clearly in Figure 28 below.

Figure 28: EM ex-China public, private and total debt (% GDP)

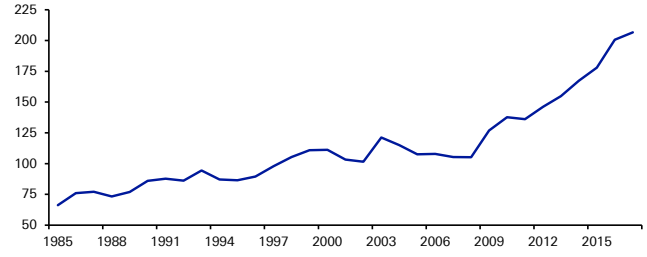


Source : Deutsche Bank, IMF

China debt growth

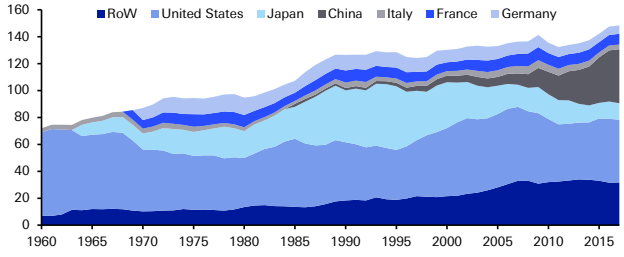
China has been a substantial marginal debt contributor to the global debt pie since the GFC, especially in the private sector (Figure 29). Figure 30 shows the global private debt/GDP series split by country and GDP-weighted. As growth slowed during the GFC, China opened the spigots to try to prop up global demand while the RoW recovered. This was probably meant to be a temporary phenomenon, but DM growth struggled to return to its pre-crisis levels and it was difficult for China to reverse course. This has led to the private debt/GDP ratio rising from c.105% in 2008 to 207% in 2018. Without China, global private sector debt would have dropped notably since the GFC. However, would global GDP growth have been much slower without it?

Figure 29: China private debt-to-GDP



Source : Deutsche Bank, IMF

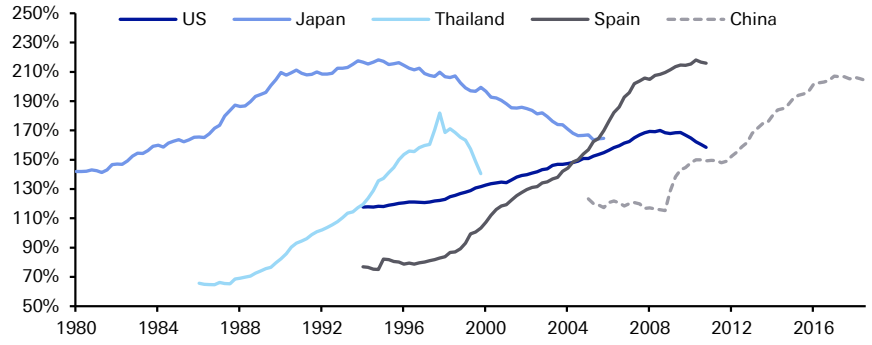
Figure 30: The US, Japan and China are by far the biggest sources of GDP-weighted private debt



Source : Deutsche Bank, IMF

Figure 31 shows this debt accumulation against some countries that have previously seen private sector debt boom/bust cycles. At this stage, it's not clear whether China can avoid the fate that has eventually created a credit crisis in these countries, but the rapid credit growth deserves close monitoring. On the negative side, it's widely appreciated that a lot of this debt funds unprofitable SOEs with the risks of zombie status prevalent alongside decreasing productivity. On the other hand, the state has control over its economy and the debt is not as exposed to investor flight as other markets that have gone through debt crises.

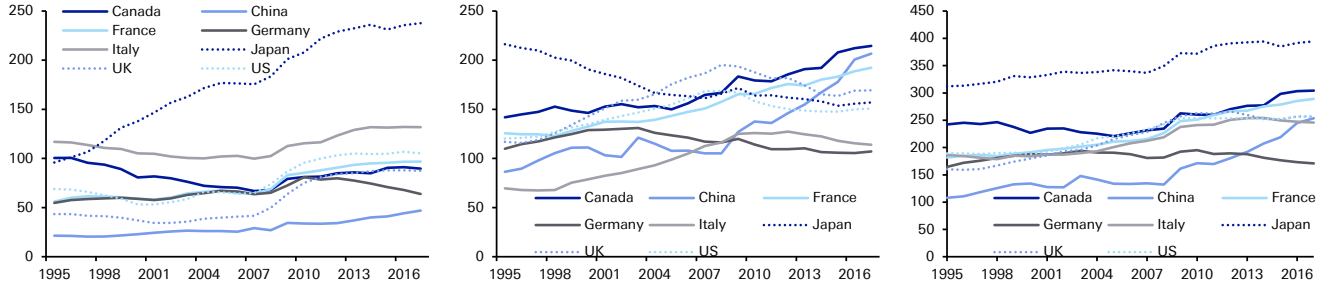
Figure 31: Non-financial debt (% of GDP) leading up to key financial crises vs. current trend for China



Source : Deutsche Bank, Haver

This rise in debt rightly appears alarming but one could say that in aggregate, China's total economy-wide debt/GDP is actually at the lower end of the G7 range with only Germany and Canada at lower levels. So within a relatively closed economy, it would seem that China could in theory control any private sector credit crisis. There is scope for government debt (currently 47% of GDP) to increase before it is at similar levels to that of its G7 peers.

Figure 32: G7 and China debt (% GDP) - public (left), private (middle), total (right)



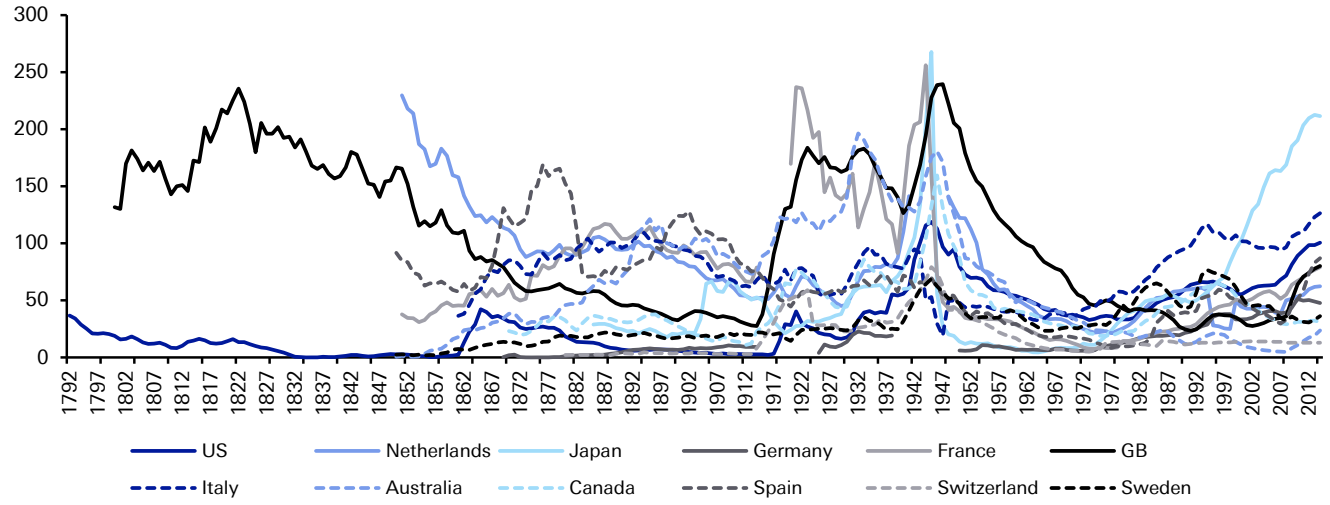
Source : Deutsche Bank, IMF

Whichever way you splice the data, both public and private sector debt levels are at extremely high levels relative to economic activity. Private sector debt has never been higher but as you'll see in the next section, public debt has on occasion been much higher through history.

The History of Government Debt

In the previous section, we have tried to break down the growth of global debt using a consistent series over the last several decades. Prior to the 1950s, there is only limited data for non-government debt, so our analysis of total debt in the global economy through history has to be confined to this period. However, we can go back much further in time when looking at government debt, as we can see from a selection of 12 major economies in Figure 33 . For the US and UK, we have debt data back to 1792 and 1802 (1700 using BoE data - see later), respectively; and data for France, Spain, Sweden and Australia begins in the 1850s. By 1885, we have a dozen major country government debt levels relative to GDP.

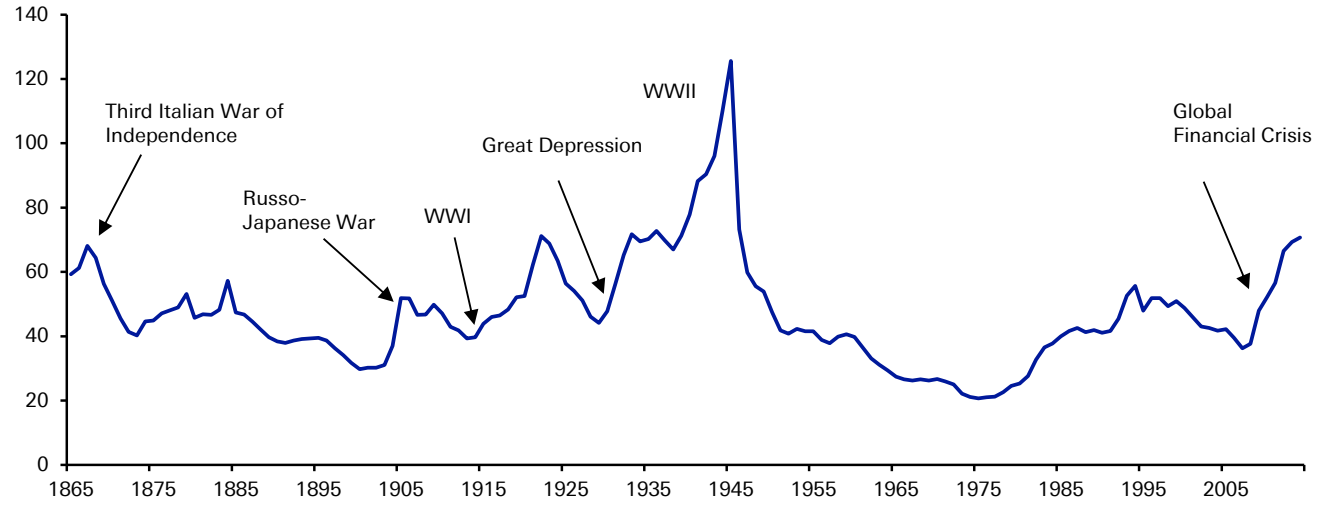
Figure 33: Government Debt/GDP ratios in 12 major economies



Source : Deutsche Bank, GFD
Note: US from 1792, Great Britain from 1800, Australia, Spain and Sweden from 1850, Netherlands from 1851 (exc. 1942-47), France from 1851 (exc. 1915-19), Italy from 1861, Germany from 1869 (exc. 1915-24, 1939-49) Canada from 1870, Switzerland from 1880, Japan from 1885

Figure 34 looks at the median debt/GDP of these countries starting in 1865, where we have eight countries, soon becoming 12 from 1885.

Figure 34: Median Debt-to-GDP ratio (All-country sample).



Source : Deutsche Bank, GFD
Note: United States, Netherlands, France, Great Britain, Italy, Australia, Spain and Sweden included from 1865; Germany from 1869 exc.; Canada from 1870; Switzerland from 1880; Japan from 1885. Germany excluded from 1915-24 and 1939-49, France from 1915-19, Netherlands from 1942-47.

As we can see, median government debt levels have been higher before, but only in war years. Interestingly, over the last 40 years we've moved from the lowest levels of government debt/GDP on record to the highest peace-time levels in history. Notably, the one country that has previously seen much higher debt/GDP than current levels on a sustained basis is the UK. Indeed, the UK is a fascinating case study of the ebbing and flowing of government debt through history without default being used as a method to reduce substantial debt levels. Indeed, after WWII the UK saw debt/GDP much higher than levels seen today for any country other than Japan.

UK government debt as a case study

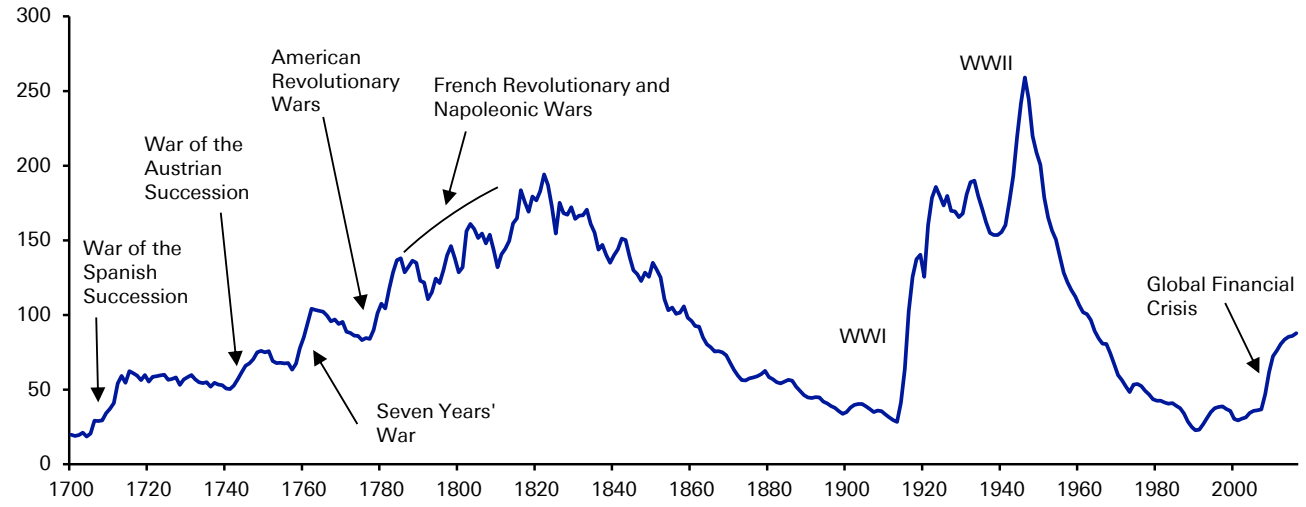
The data used above for numerous countries is from the same data source and consistent to itself. However, we can show UK government debt back even further (to 1700) using the Bank of England's data library[1] . The raw numbers are slightly lower, but the profile of debt through history is very similar.

We can use the UK as a case study of how debt has evolved over the decades and centuries – and glean lessons to examine in light of the current global situation. Probably the two most successful global de-leverings through history – that didn't involve default – occurred in the UK, first after the Napoleonic Wars in the nineteenth century and then after WWII in the twentieth.

After the Napoleonic Wars, UK government debt peaked at 194% in 1822, according to the Bank of England. Over the next 90 years, the UK saw consistent and impressive de-levering with debt falling to just 28% in 1913, on the eve of WWI. The post-WWII period saw another stunning de-levering span, with debt falling from 259% in 1947 to 23% by 1989.

1 Thomas, R and Dimsdale, N (2017) "A Millennium of UK Data", Bank of England OBRA dataset, http://www.bankofengland.co.uk/research/Pages/onebank/threecenturies.aspx

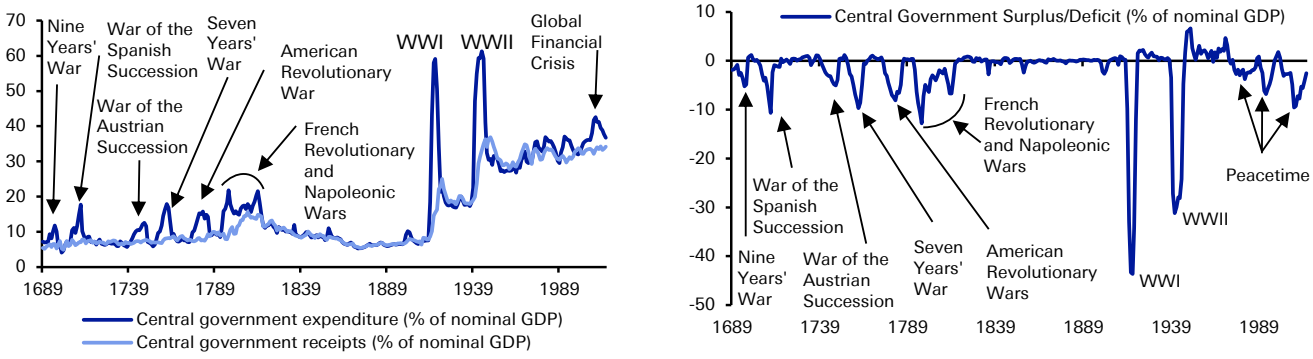
Figure 35: UK National Debt (% of nominal GDP), 1700-2016



Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

During these de-levering periods, the UK was fortunate to not be involved in a major conflict. Prior to the first period and in the three decades thereafter, the national debt was dictated by wars. Indeed, the entire eighteenth and early nineteenth centuries saw repeated stress on the country's finances due to conflicts. WWI and especially WWII then also created massive debt shocks. Figure 36 provides even better insight into the impact of wars on the nation's finances by examining government expenditures and revenues, as well as the overall budget deficit, back to 1689.

Figure 36: Historically, deficit financing in the UK has been used only for wars. Only in recent decades has it become common in peacetime situations.

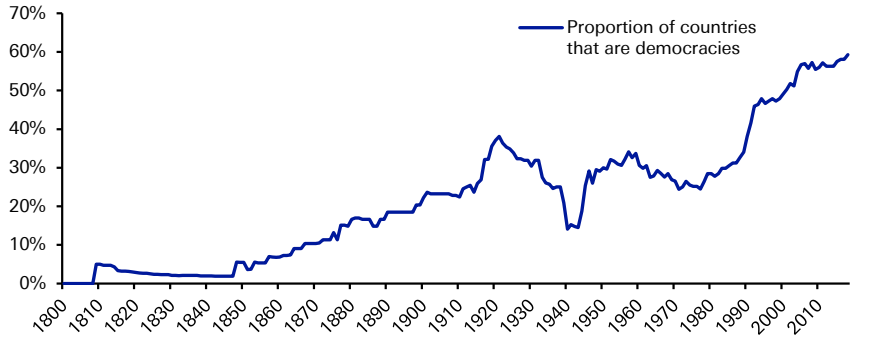


Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

What's fascinating is that until the early 1970s, the central government's budget was balanced (including interest payments) across almost all peacetime periods. So before the last 50 years, debt was something that really only financed wars. Also striking is that the role of the state was minimal prior to WWI and WWII. There is some evidence that the nineteenth century started to see government debt issued to invest in infrastructure, but it wasn't until the two world wars of the first half of the twentieth century that expenditure – and, with a lag, receipts – structurally moved much higher.

This move had its origins in the wider uptake of democracy across the globe. As Figure 37 shows using data from the Center for Systemic Peace, democracy has become an increasingly widespread phenomenon. Prior to the late nineteenth century, very few countries could be considered democracies, but their number steadily increased from the mid-nineteenth century up to WWI. The interwar period saw a retreat, but after WWII the trend recovered before a further advance in the late twentieth century.

Figure 37: Democracy has become increasingly widespread over time



Source : Deutsche Bank, Center for Systemic Peace

Even before this tipping point for democracies, the set-up for this change in government priorities and reach was moving with the expansion of the vote to a ever-wider cross-section of society regardless of sex or income. This was increasing the pressure on and incentivising political parties to offer more spending/redistribution to win votes. Indeed, the early twentieth century saw the rise of the UK Labour Party, formed to represent the newly enfranchised working class and the interests of the trade unions. And in 1924, just six years after all men had been given the right to vote, regardless of income, the country saw its first Labour Prime Minister.

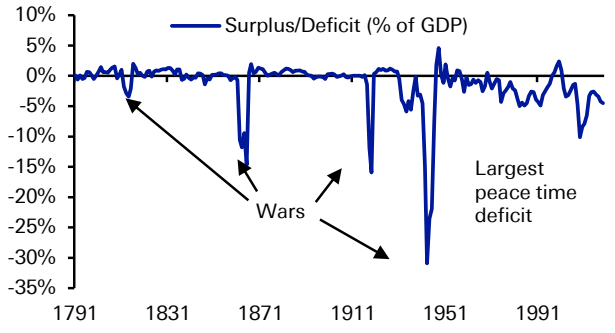
It wasn't until the post-WWII era of the welfare state and "great society"-type movements that citizens were able to demand more access to education, healthcare, a safety net for the poor and unemployed, better public services and increased provision of state pensions.

As the pressure built for more government intervention in the economy, the binding constraint was the same as it had been for most countries around the world in peacetime – money was tied to gold. This is a theme that has run through many of our long-term studies over the years, with the conclusion that peacetime economic policy prior to 1971 was almost universally dictated by the need to maintain the value of currencies to gold. Running structural deficits was impossible in such a scenario given the likelihood of a run on gold reserves as investors flocked to exit the currency on inflation fears.

In the 1960s, the combination of overly loose monetary policy and increased spending, pressures from the post-WWII welfare state, the new great society spending programs, and the Vietnam War, resulted in a tipping point. The US suspended its membership in the gold-based Bretton Woods system. Given that every other major global economy was linked to the dollar at the time, we effectively moved from a global gold standard to a fiat currency regime overnight. As Figure 36 showed us for the UK and as Figure 38 shows us for the US and Figure 39 for other major countries,

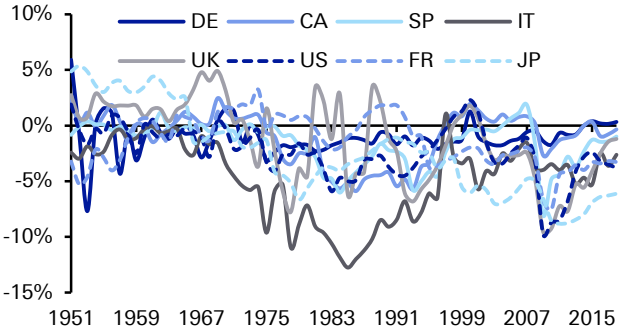
this allowed us to move to a world of structural deficits that persist to this day.

Figure 38: US budget surplus/deficit (% of GDP) since 1791



Source : Deutsche Bank, GFD, Bloomberg Finance LP

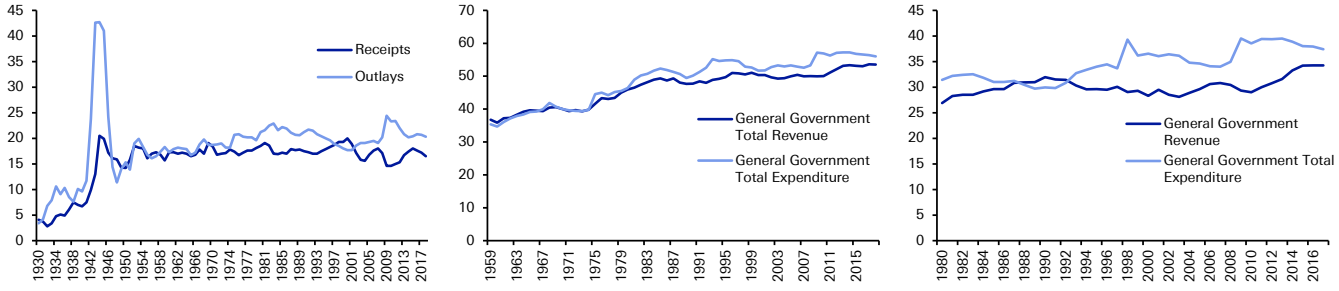
Figure 39: Global budget deficits (% of GDP)



Source : Deutsche Bank, GFD, Haver

So for the last 50 years, most major countries around the world have increased spending relative to the past but with tax revenues failing to keep up. In Figure 40 we also show revenue and spending numbers for the US, France and Japan over the last few decades. The consistent theme is spending that is structurally higher than revenues, after decades or even centuries of peacetime balanced budgets. In simple terms, for most countries, there has been a reluctance to increase revenue (essentially taxes) as much as spending. Democracy and later demography have proved challenging backdrops to balance budgets. The problem with taxing workers is that they vote, and the problem with taxing businesses in an era of globalisation is that they can move tax jurisdiction or simply divert earnings around the world to lower-tax regimes. These are clearly not easy problems to solve in an era of the welfare state/great society and of global and digital companies.

Figure 40: US (left), French (centre) and Japanese (right) government revenues and expenditures (% of GDP)



Source : Deutsche Bank, Office of Management and Budget, INSEE, Haver Analytics, IMF

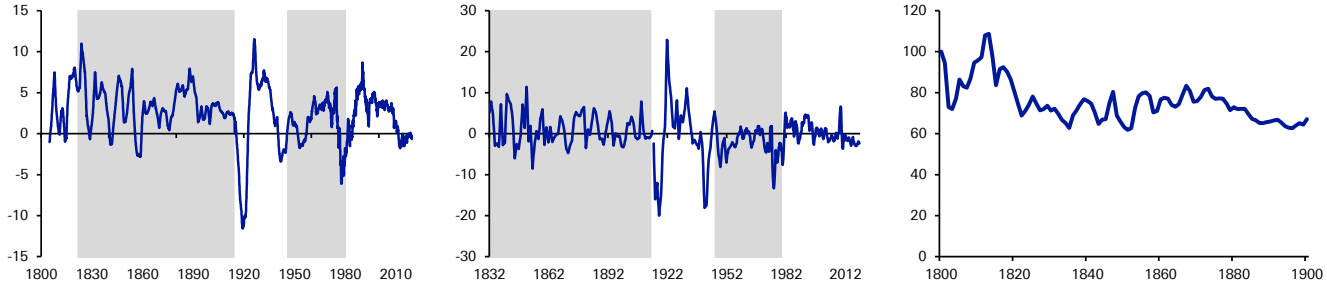
There are, of course, plenty of examples of non-democratic systems being profligate with debt, but the post-war period experienced a marked and global society-wide move to improve conditions for the wider population, which led to increased spending. Since then, governments have struggled to come to terms with how to raise enough revenue to offset this.

How debt de-levering occurred in the past and why it is unlikely today...

We will now examine how major governments de-levered through history. Along the way, we will try to assess whether past methods are realistic today. We'll again start with the UK given the long data history and also because it experienced two major multi-decade debt de-leverings from very high levels that weren't associated with nominal default.

As Figure 41 shows, the remarkable feature of the nineteenth century UK de-levering illustrated in Figure 35 was that the debt wasn't inflated away as real yields were healthily positive for most of this period. It also wasn't achieved by growth outstripping yields. Figure 41 shows that UK nominal yields were consistently above nominal GDP over this period. In addition, the UK price level was actually lower at the end of the nineteenth century than it was at the start.

Figure 41: UK Smoothed Real Yields (vs. 5yr rolling-average inflation), NY - NGDP (centre) and UK Consumer Price Index, 1800=100 (right). Shaded areas are the main deleveraging eras.

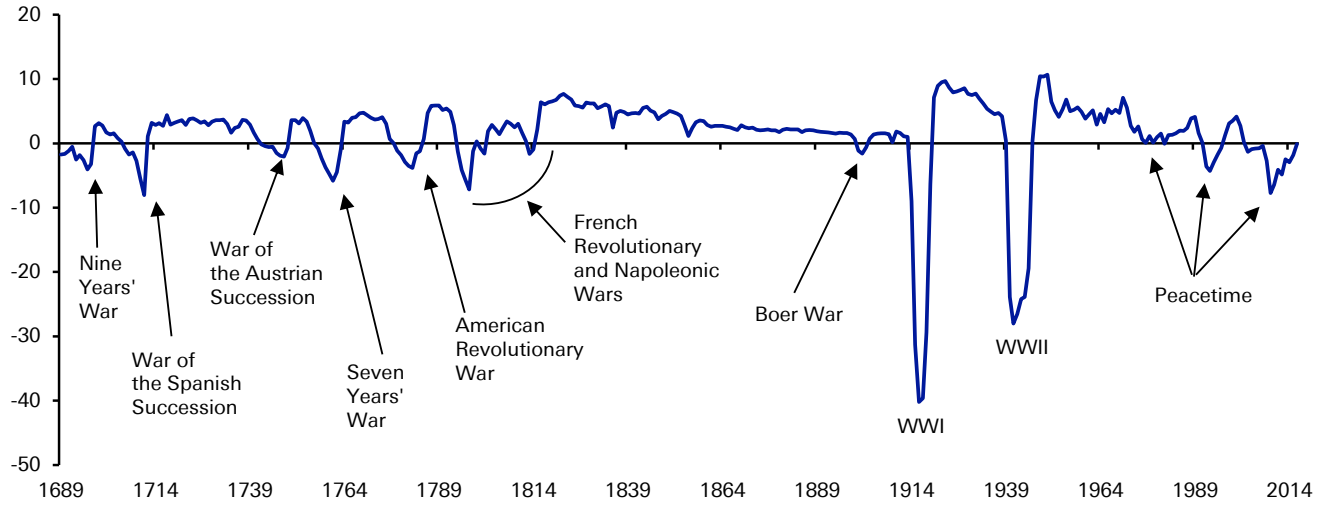


Source : GFD, Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

Instead, the key feature of this debt reduction was a 98-year (1815-1913) period in which the UK central government ran a primary surplus (Figure 42), interrupted by only a small deficit in 1900-1902 around the Boer War. However, some evidence suggests that there was self-interest at work here, as Eichengreen et al. (2019) note, referring to Macdonald (2003), that it was hard to find a Member of Parliament that wasn't a government bondholder.[2] So: discipline via self-interest. It's hard to imagine that the direct ownership of gilts is prevalent in Westminster today. It would also be nearly impossible to imagine that in today's democracies, any government could run such a persistent primary surplus without constant rebellion from voters and eventually a populist regime. Of course, there are exceptions. Norway has run a primary surplus since 1995, but it has seen a huge boost due to its oil revenues and a successful sovereign wealth fund. Germany has run a primary surplus since 2011, but that is under a lot of pressure at the moment. Italy has run a primary surplus for all but two years (around the GFC) since the early 1990s, but this is an example where doing so in modern times leads to a lack of investment in the domestic economy, very low growth and considerable political instability, resulting in the current populist movement.

2 Eichengreen et al. (2019), Public Debt Through the Ages, IMF Working Paper No. 19/6. MacDonald, J. (2003), A Free Nation Deep in Debt: The Financial Roots of Democracy, New York: Farrar, Straus and Giroux.

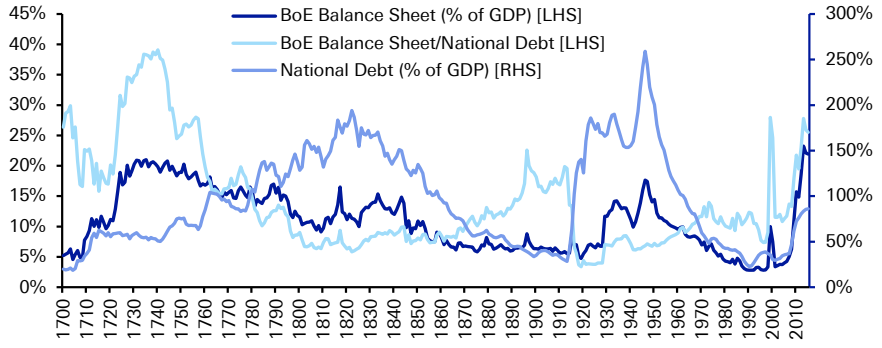
Figure 42: UK Central Government Primary Surplus (% of GDP)



Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

The near-100-year UK de-leveraging period ending on the eve of WWI also saw a little helping hand from the BoE, with its holdings of government bonds elevated through the eighteenth century war period and only running down slowly through the de-leveraging episode. As we'll explore later, central banks are likely to remain major financiers of government debt for years or perhaps decades to come, and it is noticeable from Figure 43 that the post-GFC increase in the BoE balance sheet (as a % GDP) has moved it slightly above that seen when debt/GDP was more than double the current level, around the turn of the nineteenth century. The BoE currently holds a smaller percentage of overall government debt than it did in the eighteenth century, though. Without the substantial primary surpluses seen 100-200 years ago but with debt likely to go higher, BoE holdings may well need to go much higher in the years ahead.

Figure 43: UK Debt/GDP and Bank of England Balance Sheet



Source : Deutsche Bank, Bank of England: A millennium of macroeconomic data for the UK

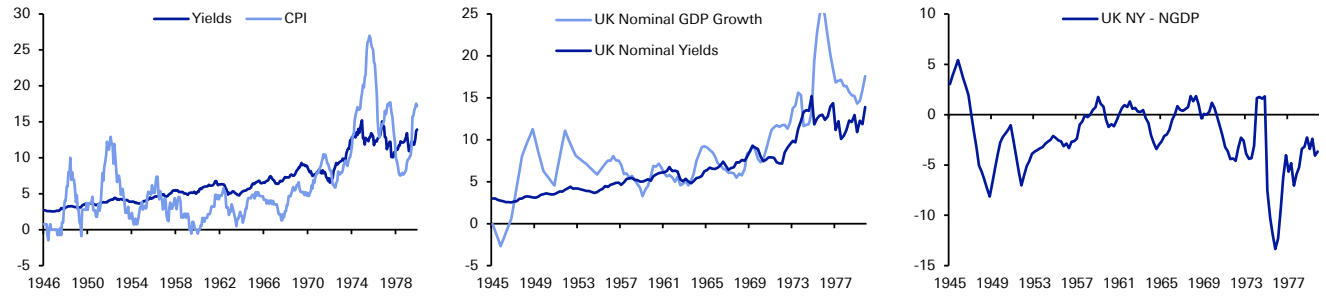
Post-WWII UK and global de-levering

Figure 33, the selection of 12 major countries' debt/GDP, shows that the post-WWII de-leveraging was not unique to the UK. However, the UK had the largest debt consolidation that wasn't corrected by default or immediate post-WWII runaway inflation. As we saw in Figure 42, the UK ran peak primary budget surpluses that were

higher post-WWI and -WWII than they were for the aforementioned post-Napoleonic de-levering experience. This return to big primary surpluses helped, but the sharp reduction in debt/GDP in the decade and a half after WWII required additional helping hands that weren't a feature of the nineteenth century experience. As shown in Figure 44 below, the UK did see three spikes above 5% inflation over this 15-year period, while yields crept up only slowly.

Supporting this was a decent level of nominal growth, consistently above nominal yields, as seen in Figure 44 . This leveled off in the 1960s before the final de-leveraging occurred in the 1970s with higher inflation and nominal growth than yields.

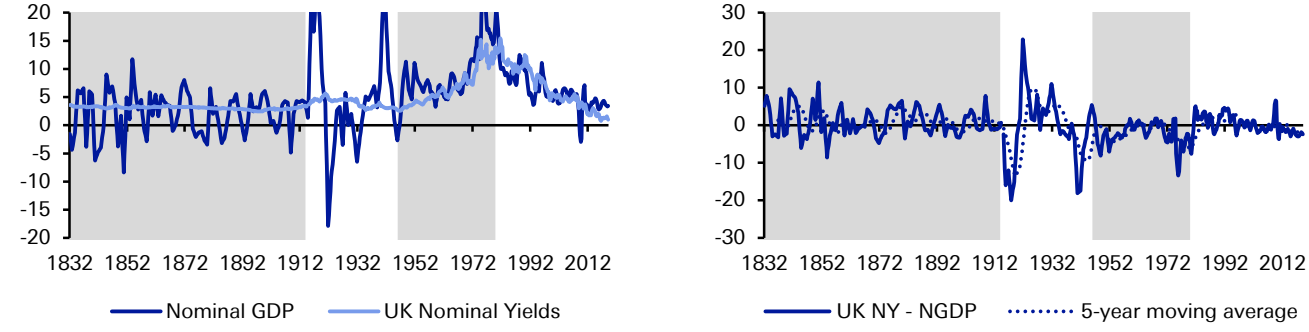
Figure 44: UK deleveraging post-WWII (left), nominal yields and GDP growth (centre), and UK NY - NGDP (right) (%)



Source : Deutsche Bank, GFD

Interestingly, Figure 45 shows that this type of debt reduction was very different from the post-Napoleonic episode; once you smooth for more volatile data, nominal yields stayed above nominal GDP throughout the 90-year de-leveraging period.

Figure 45: Comparing and Contrasting the two major UK deleveraging periods (shaded periods). UK nominal GDP growth vs. nominal yields (%)



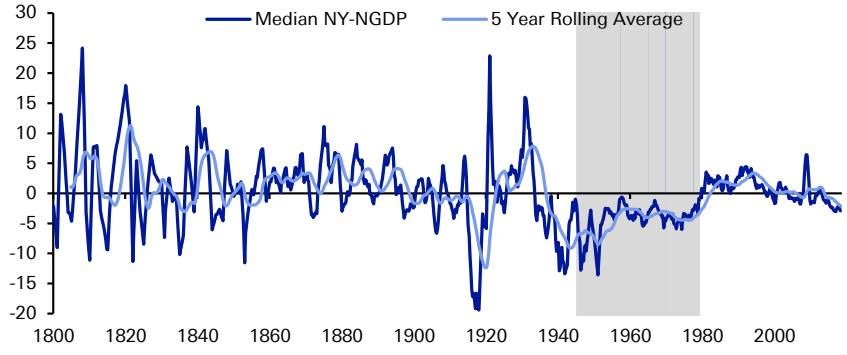
Source : Deutsche Bank, GFD

So the 1945-1980 UK de-leveraging had everything: high primary surpluses, periods of higher inflation than yields, and nominal GDP growth that was consistently above yields.

Widening the 1945-1980 period to other countries

Figure 46 shows the median level of yields - nominal GDP for 15 major economies, with this period shaded.

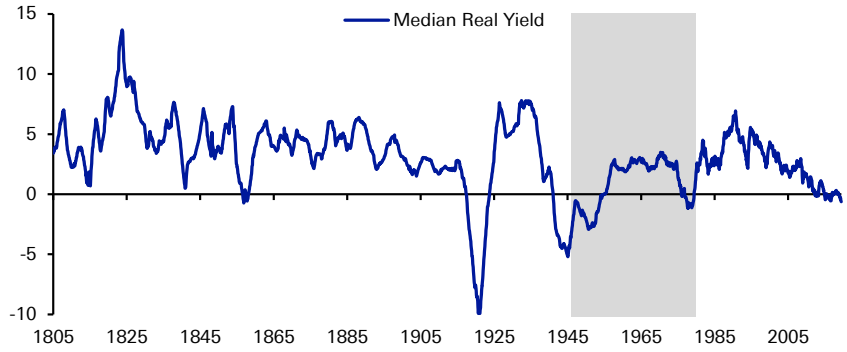
Figure 46: Global nominal yields-nominal GDP growth (15 Country Median, %) - 1945-1980 deleveraging period shaded



Source :Deutsche Bank, GFD

In the 200-plus years of history of global government debt, the only periods when yields have been below nominal GDP on a consistent basis have been for around a decade following WWI and the four decades from 1940 to 1980. Interestingly, we could currently be in the early stage of a new period in which yields are being kept below nominal GDP. If history is any guide, it could be a very long period. We'll discuss this in more detail later. Figure 47 looks at median real yields for the same selection of countries.

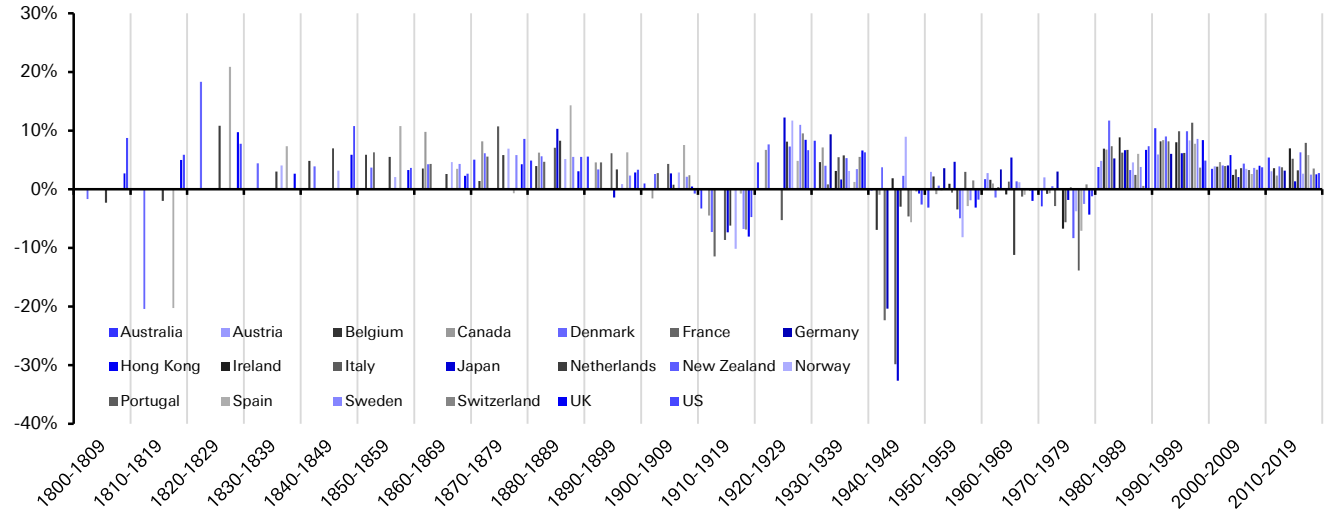
Figure 47: Real yields (15-country median, %)



Note: Real yields based on 5-year average inflation subtracted from nominal yields.
Source : Deutsche Bank, GFD

Bondholders experienced the biggest fallout from this period of global de-leveraging. Figure 48 shows the real return by decade for 20 major government bond markets over the last 200-plus years. The 1940-80 period was a difficult time for global bondholders, with positive real returns a rarity. The period immediately following WWI saw a similar, if less drawn-out, experience. As discussed above (and shown in Figure 48 and Figure 49 below) any nineteenth century deleveraging occurred without penalising bondholders. It was a more austere era, when sizeable peacetime primary surpluses were *de rigueur*.

Figure 48: Developed Market Real Bond Returns by Decade



Source :Deutsche Bank, GFD

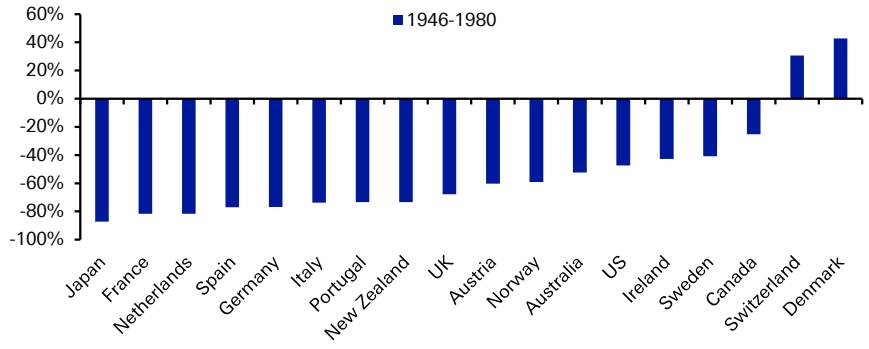
Figure 49 provides a snapshot from the data section at the back of this report, showing the raw numbers for real bond returns for each decade, and Figure 50 shows the total loss in real terms over the entire 1946-1980 period.

Figure 49: Developed Market Real Bond Returns by Decade. Shaded boxes show negative real return decades

	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Australia								5.0%	4.9%	5.6%	1.0%	-3.3%	4.6%	8.3%	-0.2%	-3.1%	1.7%	-2.9%	3.8%	10.4%	3.5%	5.4%
Austria																3.0%	2.7%	2.0%	4.8%	5.9%	3.9%	3.0%
Belgium					4.9%	5.9%	3.5%	1.4%	4.0%	0.1%	-0.1%			4.6%	-6.9%	2.2%	1.6%	-0.8%	6.9%	8.2%	3.9%	3.6%
Canada							9.8%	8.1%	6.2%	4.6%	-1.5%	-4.5%	6.7%	7.1%	-1.0%	-0.9%	1.0%	-0.7%	6.8%	8.4%	4.6%	2.3%
Denmark	-1.7%	-20.4%	18.3%	4.4%	3.9%	3.7%	4.2%	6.1%	5.6%	3.4%	2.6%	-7.3%	7.6%	4.0%	3.7%	0.6%	-1.4%	0.5%	11.7%	9.0%	4.1%	3.9%
France						6.3%	4.3%	5.6%	4.7%	4.6%	2.7%	-11.5%	0.1%	0.8%	-22.4%	-0.2%	0.4%	-2.8%	7.3%	8.2%	4.0%	3.8%
Germany														9.3%	-20.4%	3.6%	3.4%	3.0%	5.3%	6.1%	4.1%	3.2%
Hong Kong																					5.8%	-0.1%
Ireland														3.1%	1.9%	0.9%	-0.9%	-6.7%	8.8%	8.0%	2.5%	7.0%
Italy								10.7%	7.1%	6.1%	4.3%	-8.7%	-5.2%	5.5%	-29.8%	-0.6%	1.3%	-5.6%	6.3%	9.9%	3.4%	5.2%
Japan									10.3%	-1.4%	2.7%	-7.3%	12.3%	1.6%	-32.6%	4.7%	5.4%	-1.8%	6.7%	6.1%	2.1%	1.4%
Netherlands	-2.3%	-2.0%	10.8%	3.0%	7.0%	5.5%	2.6%	5.8%	8.3%	3.4%	0.8%	-6.2%	8.1%	5.8%	-3.0%	-3.4%	-11.2%	0.3%	6.7%	6.2%	3.6%	3.2%
New Zealand													7.3%	5.3%	2.3%	-4.9%	1.4%	-8.3%	3.3%	9.9%	4.3%	6.3%
Norway				4.1%	3.1%	2.1%	4.6%	6.9%	5.2%	0.9%	2.9%	-10.2%	11.7%	3.1%	9.0%	-8.2%	1.2%	-3.7%	4.6%	8.3%	3.5%	2.7%
Portugal															-4.6%	3.0%	-1.3%	-13.9%	2.4%	11.4%	3.3%	7.9%
Spain		-20.3%	20.9%	7.4%	0.0%	10.8%	3.5%	-0.7%	14.3%	6.3%	7.6%	-0.7%	4.8%	1.3%	-5.7%	-2.9%	-0.9%	-7.1%	6.1%	7.8%	2.6%	5.8%
Sweden							4.3%	5.8%	5.5%	2.3%	2.1%	-6.8%	11.0%	3.4%	0.2%	-1.9%	0.0%	-2.5%	3.8%	8.6%	3.7%	2.5%
Switzerland											2.4%	-6.9%	9.5%	5.5%	-0.4%	1.5%	-0.3%	0.8%	0.6%	3.7%	3.3%	3.5%
UK	2.7%	5.0%	9.7%	2.7%	5.9%	3.3%	2.3%	4.3%	3.1%	2.9%	0.5%	-8.1%	8.4%	6.6%	-0.8%	-3.1%	-2.0%	-4.3%	6.7%	8.4%	4.0%	2.6%
US	8.7%	5.9%	7.8%	0.1%	10.8%	3.6%	2.7%	8.6%	5.5%	3.3%	-0.7%	-4.7%	6.6%	6.3%	-2.6%	-1.8%	-0.2%	-1.2%	7.3%	4.9%	3.7%	2.7%

Source :Deutsche Bank, GFD

Figure 50: Developed Market Real Bond Returns 1946-1980

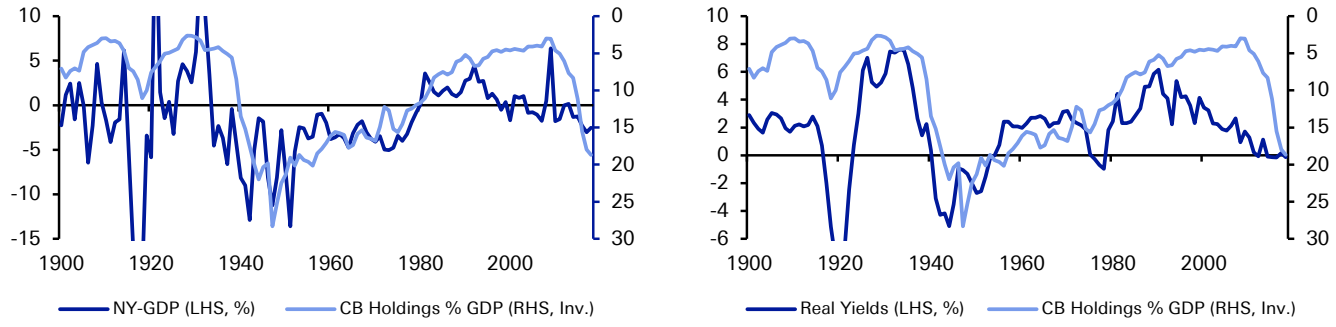


Source : Deutsche Bank, GFD

Although inflation was by no means permanently above yields in this period, the occasional bouts of high inflation and strong growth likely helped push nominal and real yields higher and higher, leading to the disastrous real returns of the era.

While financial repression was a big feature of this era, central bank holdings of debt as a proportion of the overall pie peaked just after WWII, and although it stayed historically high until the late 1970s, it was on a continuous downward path over this period. This slow relative reduction in support from the authorities probably helped contribute to real yields rising through the 1960s and 1970s and contributed to the very poor real fixed income returns in the era.

Figure 51: Global Central bank holdings of Government Debt vs MDW Nominal Yields - Nominal GDP (left) and MDW Real Yields (right)



Source : Deutsche Bank, GFD

Financial repression wasn't just limited to central banks over this period. Regulation and capital controls encouraged domestic investors into fixed income over alternatives. However, this repression weakened as the post-WWII-1980 period developed. The global de-regulation drive that gathered momentum through the 1970s and beyond, coupled with the start of the modern globalisation era, ensured that capital controls were abolished in more and more countries.

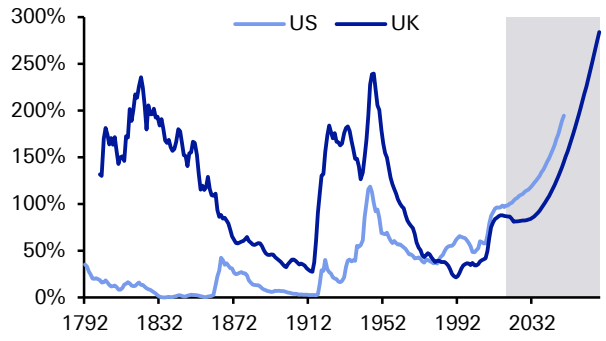
In this era, though, nominal GDP was so high that governments could de-lever while real yields were relatively elevated. In the modern era with nominal GDP so low, negative nominal and real yields have been needed to do more of the heavy lifting to stabilise the rise in debt ratios. With that in mind, we now look at the future of debt.

The Future of Debt…

In the previous section, we discussed prior de-leveraging experiences. Now, we see no obvious starting point for such a de-leveraging trend in the future for many countries. The best-case scenario might be debt mitigation and management.

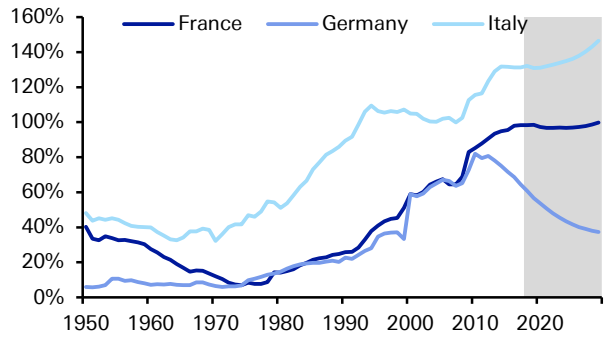
Many of the countries that are expected to see more stable government debt are still close to the highest peacetime levels, with the associated problem of very low growth and inflation. As such, the pressure might be to take advantage of all-time-low funding levels and use more debt to try to push growth higher to satisfy the demands of an ever-growing global populist movement. Figure 52 shows US and UK government debt through time alongside independent CBO and OBR forecasts over the next few decades, and Figure 53 looks at Eurostat forecasts for the next decade for Germany, Italy and France.

Figure 52: US and UK debt to GDP and long-term forecasts



Source : Deutsche Bank, OBR, CBO, GFD, Haver Analytics

Figure 53: France, Germany and Italy debt to GDP and long-term forecasts



Source : Deutsche Bank, European Commission, GFD, Haver Analytics

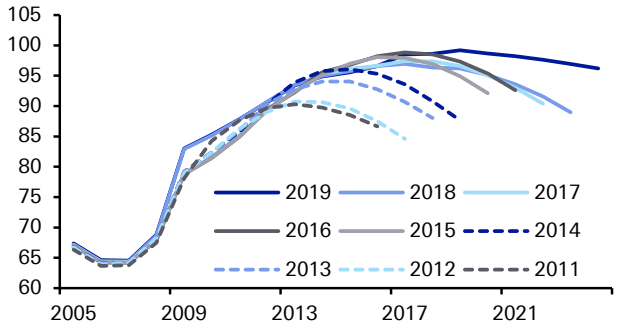
Although we don't have figures for Europe beyond the next decade, the UK figures show that the real acceleration should occur after the next decade. As such, it is reasonable to think that Europe, with a worse demographic profile than the UK, will likely face a huge increase in spending and with it pressure on deficits in the future, all else being equal. As an aside, it's not clear that the UK numbers for the next decade make sense, with both the left and right wings looking to spend more money after a decade of austerity. A hard Brexit could further increase government spending. So these assumptions appear to be based on the status quo in terms of political policy, which is increasingly looking unrealistic.

The problem with the forecasts for Europe over the next ten years is that they also assume the status quo – in this case: limited fiscal spending and strict adherence to the Maastricht treaty rules. It might not be realistic to assume that Europe can politically survive in its current form if such a scenario materialises. In the last 12 months alone, we have seen a populist coalition stretch the budget in Italy, and in France the Gilet Jaunes have forced the government to spend more. Such pressure is only likely to build with growth so low and populism this high.

Talking of Italy and France, both countries have seen estimates of their near-term government debt profile consistently too optimistic in recent years, including

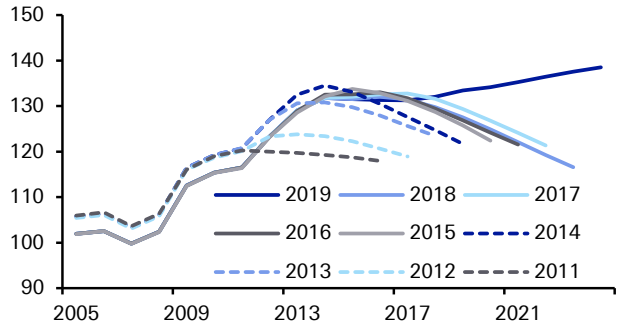
during what were above-trend growth years for the Euro area between 2014 and 2018.

Figure 54: French General Government Gross Debt Forecast (by IMF's April World Economic Outlook).



Source : Deutsche Bank, IMF

Figure 55: Italian General Government Gross Debt Forecast (by IMF's April World Economic Outlook)



Source : Deutsche Bank, IMF

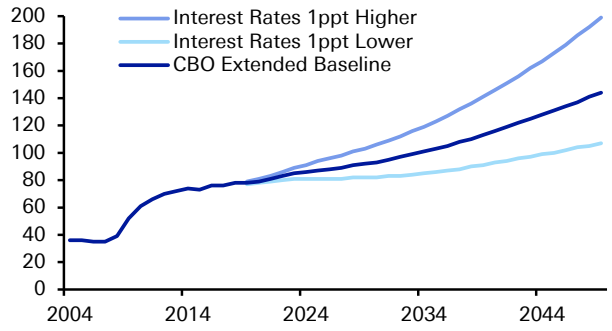
So politics could ensure that government spending continues to rise and the Maastricht treaty rules remain under pressure. Germany is one of the exceptions globally to the ever-rising tide of government debt. Figure 53 shows that it has managed to reduce debt/GDP consistently since 2010, bringing it down from around 82% to 61%. This is a remarkable effort in a world that has increased debt. However, with growth falling sharply over the last 12-18 months, pressure on the economic growth model with globalisation at risk, and with the country's large industrial sectors (e.g. autos) under duress, there will likely be increasing pressure to reignite spending. The structural weakness in the European economy and the pressure that this might bring to the union, especially in the next cyclical recession, as well as the fact that almost the entire bund curve is in negative yielding territory, suggest that even such a frugal country may eventually have to borrow more again. On a simplistic basis, can such a future divergence between the debt/GDP of Germany (expected to be under 40% in a decade) and that of Italy (expected to be over 140% in a decade) be politically sustainable? Something surely has to give.

Debt sustainability

At face value, much of the global debt burden looks unsustainable, but in an era of extraordinary financial repression, we have to consider scenarios where we have a "beautiful de-leveraging" or at least stable debt loads relative to GDP whilst still seeing large deficits.

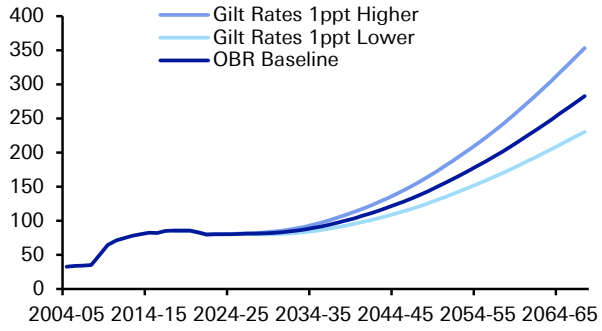
Figure 56 and Figure 57 use the CBO/OBR long-term forecasts shown above and simply run two scenarios, where interest rates are plus or minus 1ppt away from the baseline, which is shown in Figure 52 for both the US (CBO) and the UK (OBR). The OBR's gilt rate scenario assumptions vary by +/- 1pc from 2023-24 onwards (Figure 57), whereas the variation in interest rates for the CBO (Figure 56) starts at the beginning of the projection.

Figure 56: US Debt/GDP Forecast, from June 2019



Source : Deutsche Bank, CBO

Figure 57: UK Debt/GDP Forecast, from July 2018



Source : Deutsche Bank, OBR

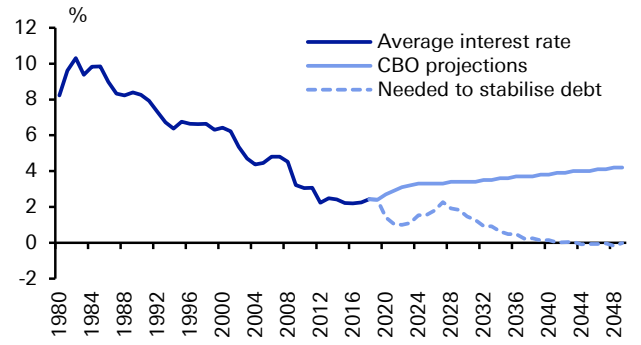
On the baseline out to 2049 (the end of the US forecast horizon) the US debt/GDP would rise to 144%. However, with a 1pp reduction in funding levels across the forecast horizon, that would be 37pp lower at 109%.

So it's clear that the central scenario used by these independent bodies sensibly assumes some reversion to the mean in funding relative to inflation and growth, with the US reversion happening sooner than the UK, which helps explain why the UK debt load doesn't climb as aggressively over the next few years.

However, if the authorities can maintain the current deeply negative real yield funding levels, then perhaps these base-case scenarios are far too pessimistic. A word of caution, though: they would need to maintain this for a generation and perhaps longer to stop debt from rising notably – and that's assuming no additional spending. That's no easy task and likely to require aggressive intervention and balance sheet expansion along the way.

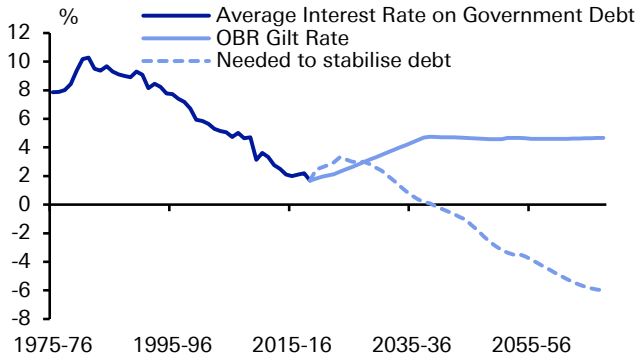
In Figure 58 and Figure 59 we reverse-engineer this and show how much funding is needed to stabilise US and UK debt/GDP at current levels. We use the output, inflation, spending, and revenue forecasts from the CBO and OBR here as well. Since the CBO uses a "current law" technique, it assumes that recently enacted tax cuts will roll off in the middle of the next decade. If that does not occur, the US would accordingly need even lower interest rates, closer to the UK's required interest rates, to keep debt stable at current levels.

Figure 58:US Treasury Funding and CBO Forecasts along with rate needed to stabilise debt



Source : Deutsche Bank, CBO, OMB, Haver Analytics

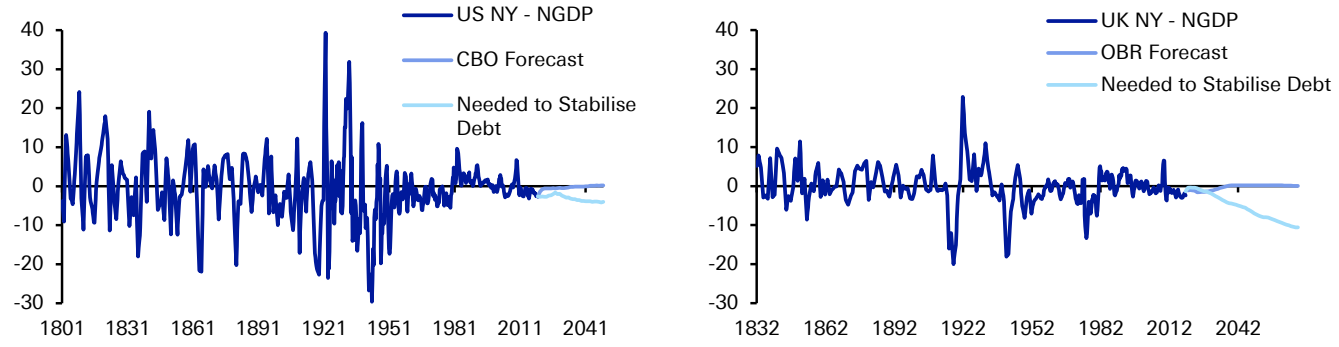
Figure 59: UK Govt Funding and OBR Forecasts along with rate needed to stabilise debt



Source : Deutsche Bank, OBR, Haver Analytics

We translate this into where nominal yields - nominal GDP would be in the future if this hypothetical debt stabilisation scenario, and all the assumptions discussed above, were to materalise. We also show this relative to the historical range of this relationship. The US levels required to keep debt stable aren't that extreme relative to the historical range, but they would likely need to be maintained for a long period of time. For the UK, the relationship between yields and growth becomes more stretched relative to history the further you go into the future, partly due to ever-deteriorating demographics and because the US example assumes tax cuts are eventually reversed – something not applicable in the UK example.

Figure 60: Nominal yields-NGDP and the gap required to stabilise debt - US (left) and UK (right)



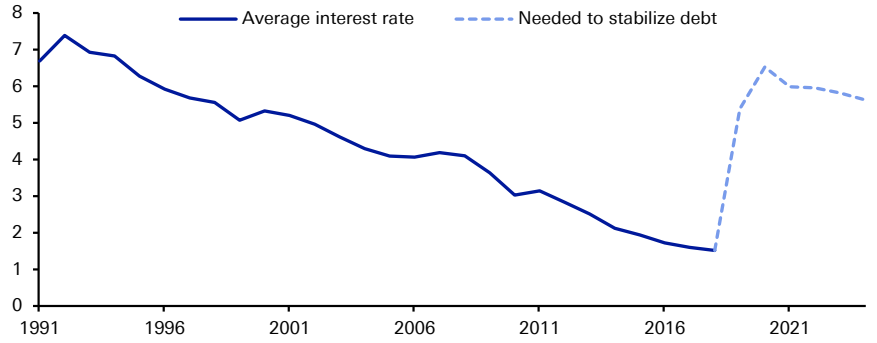
Source : Deutsche Bank, GFD, CBO, OBR

So the US and UK will have a very difficult time stabilising debt, but it could theoretically occur with a very large gap between yields and activity. At the other extreme end of the spectrum is Germany, where there is ample fiscal space and negative yields. In the chart below, we re-run our analysis to determine what level of interest rates would still be compatible with steady German debt as a percentage of GDP. We use the IMF's forecasts for growth, inflation, and public spending/revenue for the next five years.

Germany has extremely low funding costs of just over 1% of GDP and is forecast to run a primary surplus at 1.5-2.0pp of GDP for the next few years. Since current yields are even lower than current funding costs, the average cost of the debt will likely continue to fall. Even without such a fall, the IMF forecasts that debt will fall by 2.5-3.0pp of GDP every year for the next several years. Accordingly, Germany could

in theory accommodate average funding costs as high as 5-6% over the next decade and keep debt/GDP stable.

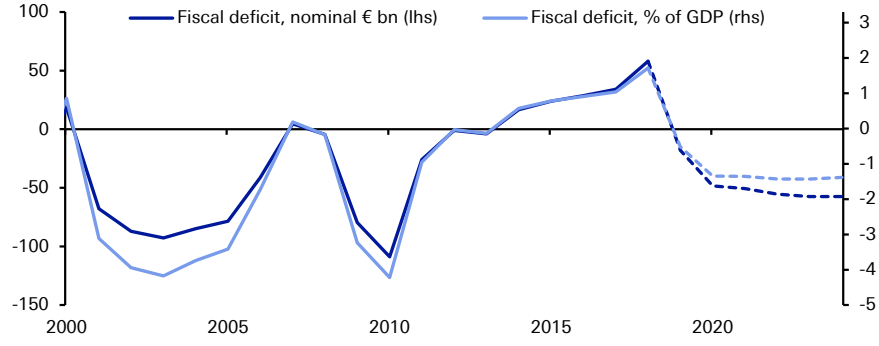
Figure 61: Germany could accommodate much higher funding costs (%) and still maintain its debt at current levels



Source : Deutsche Bank, IMF, Bundesbank

Since the German yield curve is almost completely negative, even out to 30-year maturities, there is lot of theoretical fiscal flexibility under current assumptions. By our estimates, Germany could expand annual deficits by around €60 billion per year or around 1.5% of GDP (from a similar level of surplus), every year for the next decade, and it still would not increase its debt load. That could be spent on lower tax rates, increased public investment, or elevated social spending. We appreciate that there is little political appetite for this in Germany at the moment, but things evolve and a recession or an economic threat to the European Union could change everything. For completeness, we should say that demographics become less favourable for Germany (along with much of Europe) the further you go out, so it will be difficult to stabilise debt and spend indefinitely.

Figure 62: Under current assumptions, Germany could increase fiscal deficits by around €60 billion or 1.5pp of GDP per year for the next several years, and it still would not result in a higher debt level

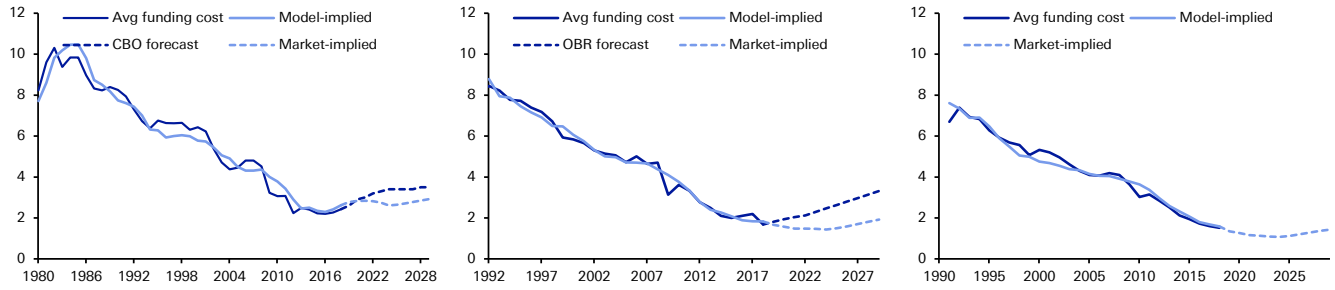


Source : IMF, Deutsche Bank Research

Taking these three major economies – the US, UK, and Germany – together, we get a varied fiscal picture. Despite the differences, there is a unifying conclusion from each country's situation: it is possible for debt to stay stable (or at least rise more slowly than expected) with reasonable deficits, so long as yields stay at ultra-low

levels. This might prove difficult to sustain, but the market is currently pricing such a funding scenario, with yields not expected to rise much from their current record-low levels.

Figure 63: Average funding costs in the US (left), UK (middle), and Germany (right) (%)



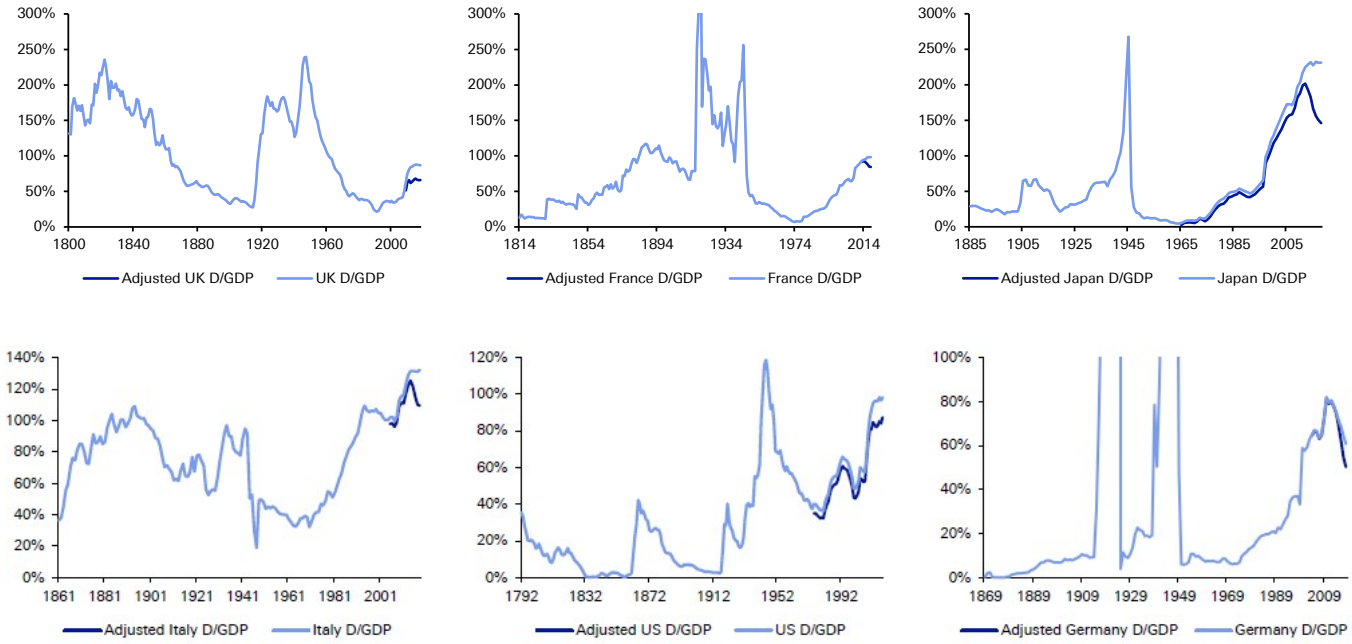
Source : Deutsche Bank, CBO, OBR, IMF, Bundesbank, Haver Analytics, Bloomberg Finance LP

Central bank holdings of governments will likely need to continue to rise to aid debt sustainability

The increase in government debt since the GFC would have left a number of countries vulnerable to default, as evident throughout the European sovereign crisis. Aggressive ECB verbal intervention (Draghi's 2012 whatever it takes speech), negative policy rates (2014-), QE (2015-) turned the tide and prevented defaults and structurally changed the funding levels for European governments. We will never know if funding rates for countries outside of Europe would have become overly penalising and restrictive had there not been aggressive rate cuts and QE.

There will be pauses and times when some major central banks aren't buying securities, but it seems likely that to finance the mountain of global debt, we will need continued central bank support for a long period to come. Figure 64 shows the impact they've had in this cycle by calculating a government debt/GDP chart that strips out government debt held by each country's central bank.

Figure 64: Government and adjusted (for central bank holdings) government debt to GDP (%)

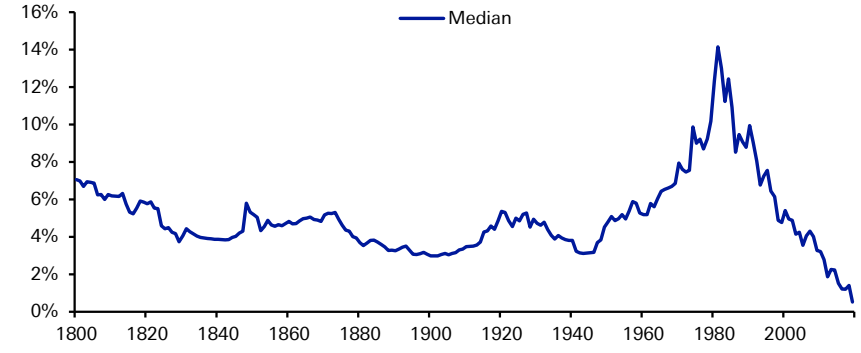


Source : Deutsche Bank, Haver, GFD

The biggest impact here has been Japan, where actual government debt/GDP gets reduced from 231% to 146% with our adjustment. Italy also sees a notable reduction, from 132% to 110%. Elsewhere, the US, UK, Germany and France debt/GDP falls 11, 21, 11 and 14 percentage points from the actual levels of 98%, 87%, 61% and 98%, respectively. So if you make an aggressive but not totally unrealistic assumption that the debt held by these central banks will never need to be repaid, then all these countries have already started deleveraging. An interesting way to look at it.

Not only have governments de-levered on this adjusted basis, but their funding costs have dramatically fallen. Figure 65 shows the impact of these major central bank purchases, and associated low or negative policy rates, on government bond yields since the GFC. Prior to the GFC, the lowest the median G7 10-year yield reached was c.3% over previous centuries. This is now close to zero.

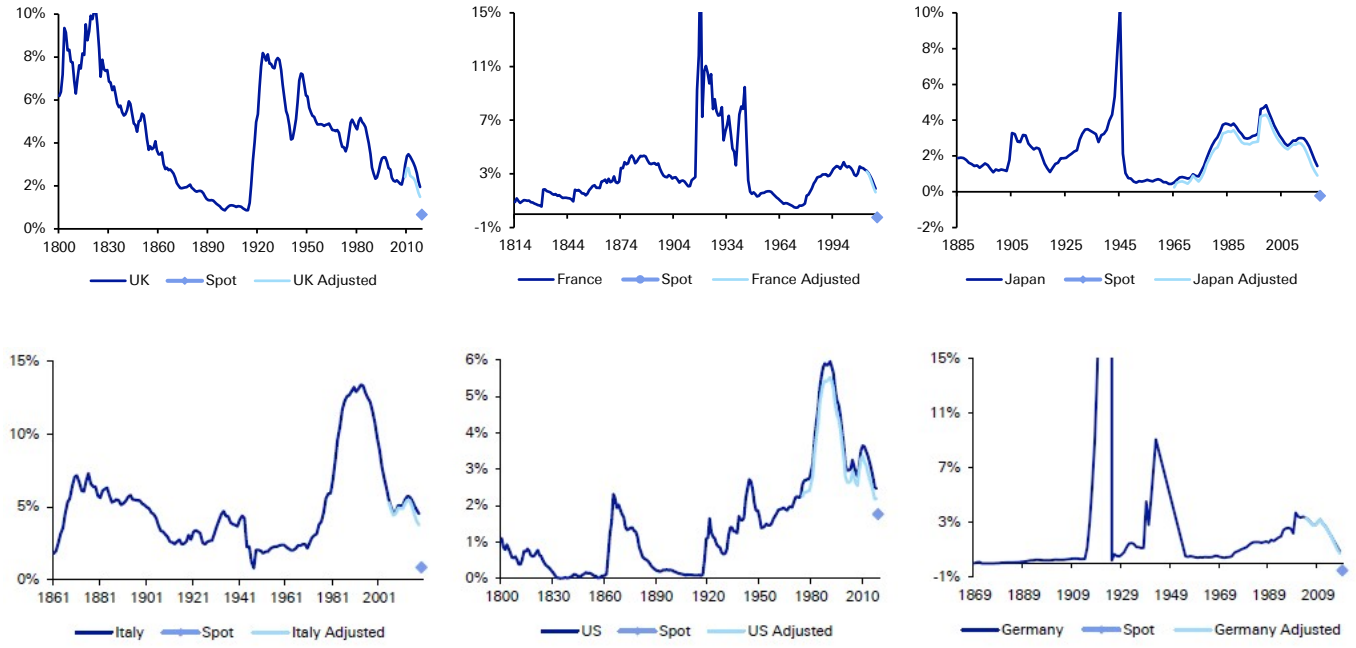
Figure 65: Median G7 10-year government bond yield



Source : Deutsche Bank, GFD

The big positive is that this has seemingly made funding increasingly easier for governments. In Figure 66 we have approximated funding costs over time for governments by using a rolling 10-year moving average of yields. Obviously spot yields (shown on the graphs) only help current funding and it takes time to refinance the entire curve. This is very back-of-the-envelope, especially given different maturity profiles for each nation, but it allows us to show a long historical context to current funding levels, and where they might reach if yields stay close to current levels for a prolonged period of time.

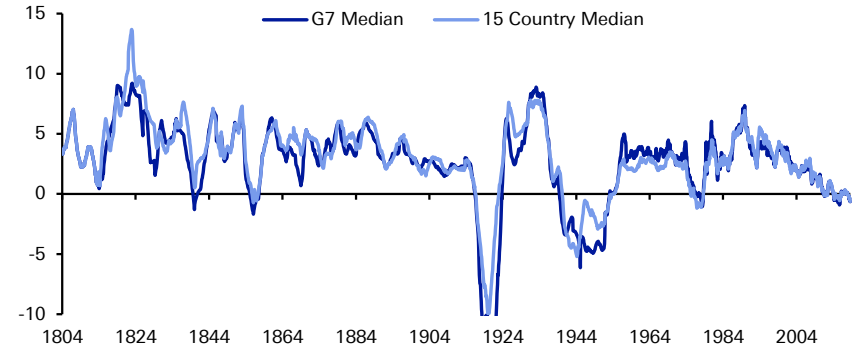
Figure 66: Average proxy funding costs (10y rolling average of 10 yr yields) as % of GDP



Source : Deutsche Bank, Haver, GFD, Bloomberg Finance LP

So central banks ensuring that nominal yields are at record lows does massively ease the burden of carrying the mountain of global private and public debt. This burden is also being eased in real terms; Figure 67 shows median real government yields in G7 countries and a wider selection of 15 major economies for which we have data stretching back well into the nineteenth century.

Figure 67: Median real yields (%)

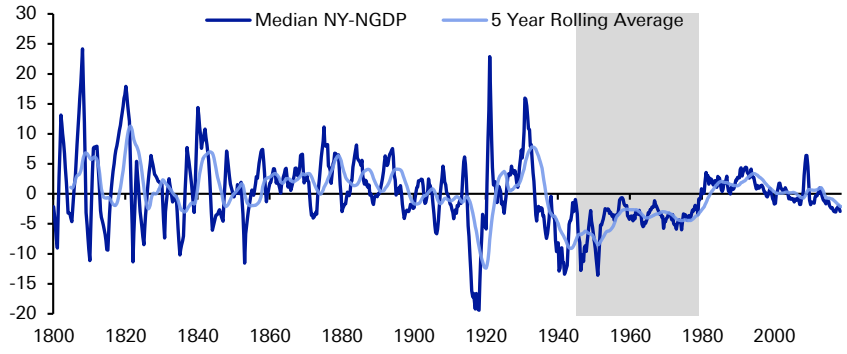


Source : Deutsche Bank, GFD

Even with our smoothed series (using 5-year rolling inflation rather than spot), the data in the nineteenth century was more volatile, with the brief spikes into negative yield territory as much a product of more volatile data as anything structurally changing. Indeed, in the nineteenth century, our median G7 smoothed real yield series averaged 4.05%. In the twentieth century, this dropped to 1.48% and has been 1.36% so far in the twenty-first. However, since this measure first went negative in mid-2012, it has averaged zero and is currently flirting with being at the lowest level since the late 1970s, when inflation was running at or around double digits in France, Italy, the UK and the US. With real yields being negative, as a minimum it reduces the build-up in debt as it erodes the value of the outstanding.

Given debt/GDP is as much about the denominator as it is about the numerator, we need to factor in the relationship between yields and growth to get a fuller picture beyond inflation and real yields. Figure 68 reprints a graph we used earlier to show that current nominal yields are comfortably below nominal GDP at the moment.

Figure 68: Global nominal yields - nominal GDP growth (15-country median, %)



Source : Deutsche Bank, GFD

As we showed earlier, the most aggressive form of government de-leveraging we've seen in the last century occurred in the 35 years after WWII. In this period the average differential (across 15 countries) was -4.37pp and averaged -8pp in the 8 years immediately after 1945. Given that MDW nominal GDP growth has averaged around 3% since the GFC and with the current run rate similar, to achieve similar NY-NGDP levels over these two periods you would need average MDW yields of around -1.37% and -5%, respectively. At the MDW level, the median 10-year government yield is currently around zero.

Famous last words perhaps, but it seems unrealistic for 10-year yields to rally multiple percentage points from here. However, if nominal GDP doesn't rise, this is what would be needed to replicate the post-WWII experience on this measure. Remember also that this period had strong growth and big primary surpluses as well, so even this would not have the same impact.

So assuming widespread default is off the table, this leaves us with one main option and that is to try to boost nominal GDP while ensuring that nominal yields stay stable or rise by less than, or in line with, the increase in growth. In our opinion this is likely to be the main policy move over the next decade. If the post GFC decade has all been about printing money to buy financial assets, we think the next decade will be more about printing money and injecting it into the real economy.

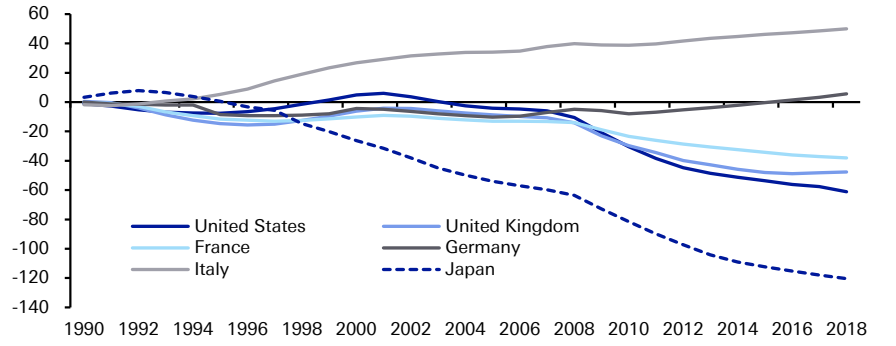
How Policy Will Change over the Next Decade

Minimal de-levering, but an attempted managed increase in debt

The main ways to de-lever through history have been to a) default, b) run large primary surpluses, c) keep real yields negative or d) ensure nominal yields are well below nominal GDP. In reality, it's been a combination of the above. In the current era, the first two seem completely unpalatable for most. Given how much debt there is and how systemic it seems to be, the authorities' desire to see wide-scale debt restructuring seems minimal at this point. The fear would be that allowing restructuring in one over-indebted entity could create fears of a domino impact elsewhere. Debt is viewed as too systemic to our economic system. It's not clear that this will change as debt piles get larger.

In terms of maintaining high primary surpluses for a prolonged period, we've already discussed that this seems like a solution more appropriate through history than it does today. Widespread primary surpluses seem to be a relic of the past, mostly used in periods when democracy wasn't as strong as it is today or when the pressures to have a welfare state or big society weren't so prevalent. When we look at the UK's primary surpluses through history back in Figure 42 , it seems incongruous from today's standpoint that we could have a period of nearly two decades during which the government runs a primary surplus of more than 5% of GDP every year, shallowing out to what amounted to a near-century of continuous primary surpluses, ending of the eve of WWI. Figure 69 shows that the only major DM economy in the last three decades to have a persistent and cumulative primary surplus has been Italy – a move that has contributed to a lack of public investment in the economy, reinforced low growth and helped create the current populist movements.

Figure 69: Cumulative General Government Primary Balances since 1990 (% of GDP).



Source : Deutsche Bank, OECD (2019) Economic Outlook No 105, May 2019

So assuming that defaults and widespread primary surpluses are unlikely and that deficits largely remain, de-leveraging is challenging for the vast majority of countries unless you can manufacture a substantial gap between nominal GDP and nominal yields. At the moment with nominal growth so low in many high-income countries, this requires a Herculean effort in terms of driving bond yields into deeper and deeper negative territory. If current yields can remain as similar levels to today, though, we've shown elsewhere in this report (debt sustainability section) that it's

possible to stabilise debt, or at least limit the climb in many circumstances. Figure 70

Figure 70 and Figure 72 show a wide selection of the largest DM and EM countries with the key column being the differential between 10-year yields and nominal GDP. Of the 32 DM countries, only four have 10-year yields above current nominal GDP (shaded in the table).

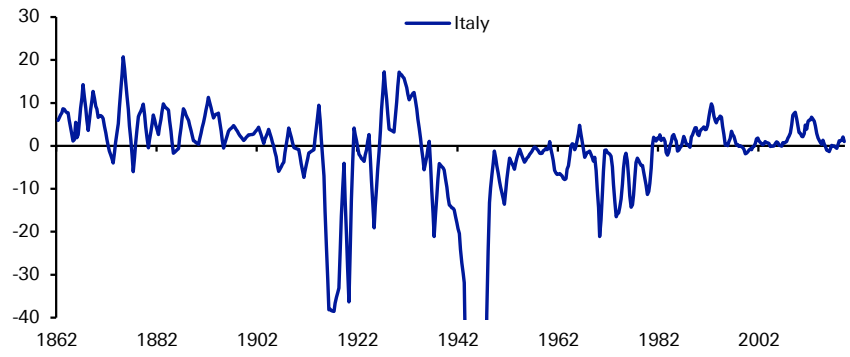
Figure 70: Current DM 10yr yields vs. nominal GDP

Country	10yr Yield-NGDP	2019 Debt/GDP	Economy Size Rank	Nominal Yield	NGDP (YoY)	CPI (YoY)	Real Yield
Japan	-1.5%	238%	3	-0.2%	1.3%	0.5%	-0.7%
Greece	-0.5%	174%	41	1.5%	2.0%	0.1%	1.4%
Italy	0.3%	133%	8	0.8%	0.5%	0.5%	0.3%
Portugal	-2.7%	119%	39	0.3%	3.0%	-0.1%	0.4%
Singapore	1.0%	109%	29	1.8%	0.8%	0.4%	1.4%
US	-2.2%	107%	1	1.8%	4.0%	1.7%	0.1%
Cyprus	-3.7%	101%	54	0.5%	4.2%	0.5%	0.0%
Belgium	-2.8%	100%	23	-0.2%	2.6%	0.9%	-1.1%
France	-3.1%	99%	7	-0.2%	2.9%	1.3%	-1.5%
Spain	-3.0%	96%	13	0.3%	3.3%	0.4%	-0.1%
Canada	-2.2%	88%	10	1.5%	3.7%	2.0%	-0.5%
UK	-2.5%	86%	5	0.7%	3.2%	2.1%	-1.4%
Austria	-3.4%	71%	25	-0.2%	3.2%	1.4%	-1.6%
Slovenia	-5.5%	65%	51	0.1%	5.6%	2.0%	-1.9%
Ireland	-7.8%	62%	27	0.0%	7.8%	0.6%	-0.6%
Finland	-3.5%	60%	36	-0.2%	3.3%	1.2%	-1.4%
Israel	-3.7%	59%	28	1.1%	4.8%	0.6%	0.5%
Germany	-2.6%	57%	4	-0.5%	2.1%	1.0%	-1.5%
Netherlands	-5.3%	52%	17	-0.4%	4.9%	2.6%	-3.0%
Slovakia	-5.4%	47%	46	-0.3%	5.1%	3.0%	-3.3%
Australia	-4.2%	41%	14	1.2%	5.4%	1.6%	-0.4%
Korea	0.2%	41%	11	1.5%	1.3%	0.0%	1.5%
Switzerland	-1.7%	39%	19	-0.7%	1.0%	0.5%	-1.2%
Sweden	-3.8%	37%	22	-0.1%	3.7%	1.3%	-1.4%
Norway	2.0%	37%	26	1.4%	-0.6%	1.5%	-0.1%
Latvia	-4.9%	37%	52	-0.1%	4.8%	3.1%	-3.2%
Taiwan	-1.3%	34%	20	0.7%	2.0%	0.4%	0.3%
Denmark	-4.0%	34%	32	-0.5%	3.5%	0.5%	-1.0%
Iceland	-2.9%	33%	53	3.6%	6.5%	1.6%	2.0%
Czech Republic	-5.0%	32%	37	1.4%	6.4%	2.6%	-1.2%
New Zealand	-3.0%	28%	42	1.3%	4.3%	1.7%	-0.4%
Luxembourg	-4.0%	22%	47	-0.2%	3.8%	1.4%	-1.6%

*Note: Rank refers to the order of largest to smallest economies in our sample (across DM and EM). Shadings are where either nominal GDP or inflation are above bond yields. * - The bond yield is based on a USD bond rather than a local currency bond.*
Source : Deutsche Bank, Bloomberg Finance LP, IMF (for debt/GDP)

One of those four is Italy, and although yields have collapsed in the weeks leading up to this publication, it still has the issue of funding above the current nominal growth rate. This is an issue the country has had for nearly four decades.

Figure 71: Italy nominal 10yr yield - nominal GDP growth (%)



Source : Deutsche Bank, GFD

For EM countries the majority fund below nominal GDP, but there are clearly more exceptions as you would expect from a mostly weaker credit-rated universe.

Figure 72: Current EM 10yr yields vs. nominal GDP

Country	10yr Yield-NGDP	2019 Debt/GDP	Economy Size Rank	Nominal Yield	NGDP (YoY)	CPI (YoY)	Real Yield
Lebanon*	7.8%	158%	50	13.8%	6.1%	1.5%	12.4%
Brazil	1.8%	90%	9	7.3%	5.5%	3.4%	3.9%
Croatia	-3.4%	71%	49	0.5%	3.9%	0.9%	-0.4%
India	-1.3%	69%	6	6.7%	8.0%	3.2%	3.5%
Hungary	-7.9%	67%	44	2.0%	10.0%	3.1%	-1.1%
Ukraine*	-7.8%	62%	45	6.8%	14.6%	8.8%	-2.0%
South Africa	4.4%	58%	31	8.9%	4.5%	4.0%	4.9%
Malaysia	-1.7%	56%	30	3.3%	5.0%	1.4%	1.9%
China	-5.2%	55%	2	3.1%	8.3%	2.8%	0.3%
Mexico	2.2%	54%	15	7.2%	5.1%	3.0%	4.2%
Qatar*	1.1%	53%	43	2.6%	1.5%	0.0%	2.7%
Colombia	-1.3%	49%	34	6.1%	7.4%	3.8%	2.3%
Poland	-5.4%	47%	21	2.1%	7.5%	2.6%	-0.5%
Thailand	-2.1%	41%	24	1.6%	3.7%	0.5%	1.0%
Philippines	-1.8%	39%	33	4.8%	6.6%	1.7%	3.1%
Romania	-6.9%	38%	38	4.1%	11.1%	3.9%	0.2%
Turkey	-0.4%	30%	18	14.6%	15.0%	15.0%	-0.4%
Indonesia	-0.3%	29%	16	7.2%	7.6%	3.5%	3.8%
Peru	1.7%	27%	40	4.1%	2.5%	2.0%	2.1%
Chile	-1.5%	27%	35	2.8%	4.3%	2.6%	0.2%
Bulgaria	-10.3%	19%	48	0.3%	10.6%	2.5%	-2.2%
Russia	1.5%	14%	12	7.0%	5.5%	4.3%	2.7%

*Note: Rank refers to the order of largest to smallest economies in our sample (across DM and EM). Shadings are where either nominal GDP or inflation are above bond yields. * - The bond yield is based on a USD bond rather than a local currency bond.*
Source : Deutsche Bank, Bloomberg Finance LP, IMF

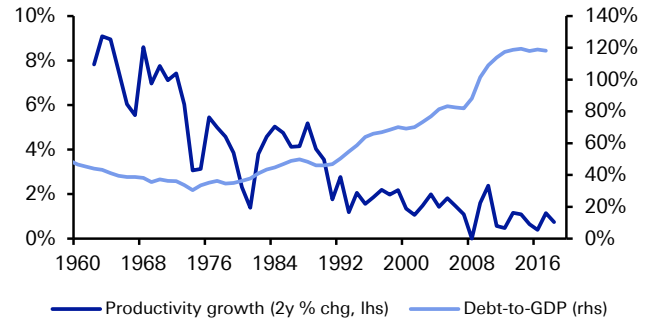
So despite high debts, global government finances currently look in reasonable shape due to extraordinary funding conditions. However, growth levels are very low historically, especially in the developed world, and it's not clear that this is politically sustainable.

At some point, the economic and political pressures are likely to build, and politicians will respond to the growing populist movement and increase fiscal spending. Even without populism, politicians will surely eventually see the extremely low funding levels as an opportunity to spend and invest in the economy and create growth.

The hardest part of this equation would be to create notably higher real GDP growth. Demographics alone make this arithmetically more difficult than it has been in pre-

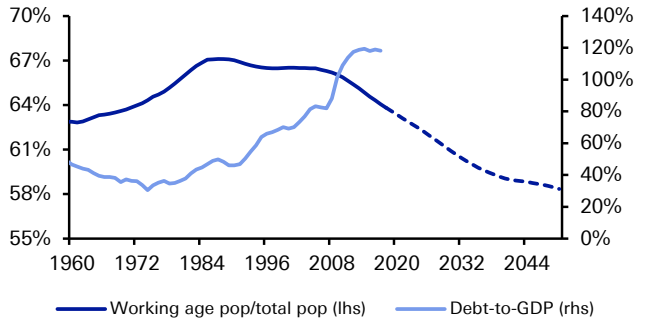
vious de-leveraging periods. Numerous academic papers have been written to explain the multi-decade slowdown in productivity, and it is beyond the scope of this report to assess how productivity could improve. While this is a deeply complex issue, we can't help but wonder whether the debt burden itself plays a large part in the productivity slump we find ourselves in.

Figure 73: Debt has risen as productivity growth has slowed



Note: Averages of France, Germany, Japan, UK and US
Source : Deutsche Bank, OECD, IMF, Haver Analytics

Figure 74: Demographic trends have been favourable but are set to deteriorate



Note: Averages of France, Germany, Japan, UK and US
Source : Deutsche Bank, IMF, UN, Haver Analytics

In today's world of higher and higher aggregate debt, with very little appetite for defaults, and ultra-low interest rates, the risk is the creation of a zombie-like economic environment where inefficient entities/debt stays alive and blocks the success of more efficient growth-enhancing entities. The opposite of creative destruction. Regulation has reinforced this, as in recent decades it has encouraged long-term investors more into debt over, say, equity. As a debt investor, you only really care about whether you're likely to get your money back and your interest. If default risk has been minimised and funding rates artificially lowered, then your concern over whether that entity is profitable – or even solvent under normalised interest rates – is limited. So the significant re-emphasis on debt over equity finance in recent years must surely hurt productivity. If correct, then until the debt load becomes more manageable relative to the size of economies, it's unlikely that productivity will markedly improve enough to move the dial (all else being equal).

Inflation in today's era is purely a political choice

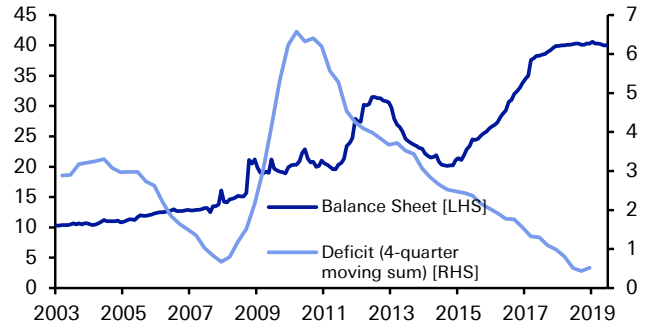
We will go on in this section to suggest that if we are in a quasi liquidity trap, then fiscal spending can help real growth, but there will be a ceiling given the demographics and structural productivity constraints.

So policymakers may end up relying on trying to elevate nominal GDP via higher inflation. The good news for them, in our opinion, is that inflation under a fiat currency regime is a political choice. If you have the keys to the printing presses, you can always generate inflation if the policies are correct. The fact that we've had large asset price inflation since QE led to a global wave of asset buying should be evidence of this. So if printed money went directly into the real economy, it would be highly likely to create inflation and higher nominal GDP.

We think the biggest likely policy change is that in the next downturn, money printing will be less about purely buying assets (although that will still be necessary) and more about injecting money into the real economy. In effect, more co-ordination

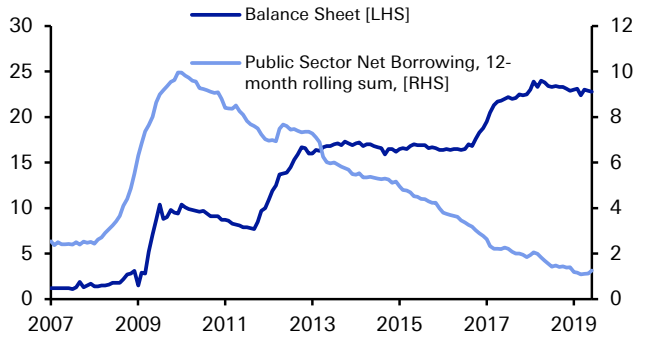
between monetary and fiscal policy. This hasn't happened much since the GFC, as we can see in Figure 75 - Figure 78 .

Figure 75:ECB Balance Sheet and Euro Area Budget Deficit (% of GDP)



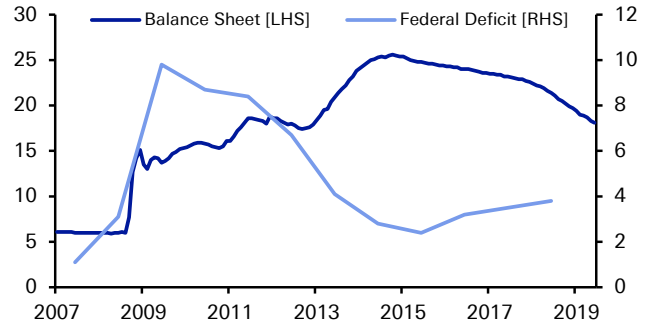
Source :Deutsche Bank, ECB, Haver Analytics, Bloomberg Finance LP

Figure 76:Bank of England Balance sheet and UK Budget (% of GDP)



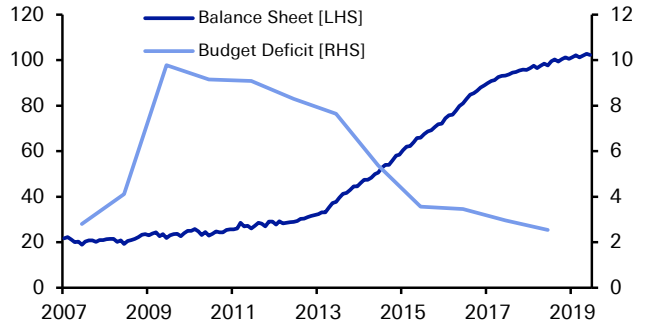
Source : Deutsche Bank, ONS, Haver Analytics, Bloomberg Finance LP

Figure 77: Federal Reserve Balance Sheet and US Budget Deficit (% of GDP)



Source : Deutsche Bank, OMB, Haver Analytics, Bloomberg Finance LP

Figure 78: Bank of Japan Balance Sheet and Japan Budget Deficit (% of GDP)



Source : Deutsche Bank, Bloomberg Finance LP

In the aftermath of the GFC, some evidence suggests that US and UK unconventional monetary policy and fiscal policy complemented each other as QE coincided with higher fiscal deficits. However, the reality is that fiscal deficits were higher less because of new aggressive spending plans and more because of automatic stabilisers and sticky spending relative to collapsing revenues. Nevertheless, QE arguably helped finance those deficits.

In Europe and Japan, aggressive balance sheet accumulation (via QE) occurred only when deficits were on a downward trajectory. Indeed, in the US, the recent fiscal expansion has coincided with the Fed running down its balance sheet. So in the post-GFC years, we've not seen an active policy for central banks to print money with the specific focus of using it for incremental spending in the real economy.

Helicopter money and/or MMT – the next big policy shift?

There has been much recent discussion regarding the effectiveness of monetary policy in a world of ultra-low interest rates. Indeed, the Federal Reserve is currently conducting a review of its policy framework to better prepare itself for future recessions in which policy rates are likely to return to zero. When monetary policy struggles to gain traction, as has been the case on many occasions over the last decade, the scope improves for fiscal policy to pick up the slack.

Even central bankers have recently begun to call for more expansionary fiscal policy to support demand (e.g. Draghi), but the likelihood is that for now they will have to continue to explore more unconventional policies. These include quantitative easing, monetary financing of governments, and direct cash transfers to households. Collectively, these are sometimes referred to as helicopter money, and some forms blur the lines between traditional monetary and fiscal policy.

At the same time, there has been increased interest among politicians in the scope for wider fiscal deficits. In Europe, parties across the ideological spectrum have shifted in favour of looser fiscal policy even if the "New Hanseatic League" means that fiscal conservatism is entrenched in the north. In Italy, the most recent coalition government of left- and right-wing populist parties has angled for tax cuts and higher social spending, while in the UK, new Prime Minister Boris Johnson has signalled plans to expand the deficit by several tens of billions of pounds. Both examples are likely to lead to higher debt with someone needing to finance this.

In the US, fiscal deficits are already extremely wide despite low unemployment and supportive macro fundamentals. This has been a bipartisan trend, as Democrats have pushed for higher discretionary spending and more expansive healthcare, while Republicans have supported higher defense spending and lower taxes. The result has been ever-widening budget deficits in all climates. It's hard to see this changing anytime soon.

Some politicians are beginning to seriously propose a regime of "modern monetary theory" or MMT. The theory is sometimes distilled into the takeaway that: "deficits don't matter." MMT is more nebulous than that, and it can sometimes be difficult even for proponents to nail down what it entails. Below, we will discuss one common definition of the theory and its implications. But first, we will define more mainstream versions of unconventional policy.

What is helicopter money?

As discussed in DB's Helicopters 101: your guide to monetary financing , there are four main forms that helicopter money typically takes: We've added our own nuances to the debate.

1. Quantitative easing and fiscal expansion. The central bank expands the supply of base money by creating reserves to buy government debt. This lowers the government's funding costs, making space for more fiscal expansion. While still an unconventional policy, this tool now has an established track record in developed markets. We would argue though that proper coordination between monetary and fiscal has only fleetingly happened since the GFC (see Figures Figure 75 - Figure 78). Much of the QE that has occurred has been done while governments have been reducing their deficits and has been conducted by independent central banks primarily in an attempt to meet their inflation targets and not tied to

government spending.

2. Cash transfers to governments. This is similar to QE, discussed above, but is a permanent move by the central bank. The central bank increases the government's cash balance and effectively receives the equivalent of a zero-coupon perpetual bond in return. This more directly supports the government's budget balance and theoretically provides a greater impetus for fiscal expansion. In this case a hypothetical rise in the debt/GDP ratio is arguably meaningless from a solvency point of view as there is no pressure to ever pay it back. With many countries seeing yields below zero across the maturity spectrum, we're not as far away from this as might be imagined. Surely governments can find investments that would yield short- and long-term returns over and above a zero/negative nominal financing rate?
3. Haircuts on central-bank-held debt. In this scenario, the central bank unilaterally decides to reduce the value of its government debt holdings. For example, the central bank could decide to take a 5% haircut on the value of bonds it had previously bought. This would function similarly to QE, but would again be permanent. It would also entail the central bank taking a loss, likely resulting in negative equity.
4. Cash transfers to households. This is similar to cash transfers to governments, but the central bank does not receive a zero-coupon perpetual bond in return. Instead, like in the haircut example, the central bank takes a hit to its equity, likely resulting in a negative equity position. In an era of populism and with more backlash against central banks buying financial assets, which predominantly helps richer asset owners, such a policy shift is likely to become more popular in the years ahead, especially during the next downturn. At face value, printing money to provide handouts to citizens is in many ways fairer and more likely to result in higher economic activity than printing money to buy financial assets where the owners are typically at the highest end of the income/wealth spectrum.

While "negative equity" sounds like a worrying issue, it is actually not highly significant. Central banks can run negative equity positions in perpetuity. They will never have to reconcile their accounts to address the issue. Instead, a central bank would likely stop making remittances to its domestic finance ministry and would instead re-accumulate funds to rebuild its equity position as needed. Of the major central banks, none is barred from rolling over a negative equity position, and none is explicitly banned from handing cash directly to the public.

What is modern monetary theory?

Modern monetary theory (MMT) has similar outcomes to helicopter money, i.e. a large expansion of the monetary base via reserve creation, but its basis is fundamentally different. Instead of the monetary authority deploying a wide range of tools, MMT swaps the traditional roles of fiscal and monetary policy. Under MMT, the fiscal authority is responsible for macroeconomic stabilisation; when growth and inflation are below trend, the fiscal authority spends money or cuts taxes to encourage activity. Correspondingly, if and when the economy starts to overheat, the fiscal authority should respond by reducing its spending and raising taxes. As long as there is no overheating, fiscal deficits simply do not matter under MMT.

MMT-type theories are becoming more attractive to many politicians and economists, since in much of the developed world, growth and inflation have persistently disappointed compared to targets. MMT advocates argue that monetary policy has reached the limits of its effectiveness, whereas fiscal policy has more space to provide stimulus. To boost demand in the current environment, they argue, fiscal policy

would be much more effective, precluding the need for the central bank to experiment with further unconventional policies. Instead, the central bank's only job is to expand the monetary base enough to accommodate the fiscal spending. Interest rates are not targeted, and will ultimately go as low as necessary under the fiscal policy setting.

Comparison of helicopter money and MMT

Helicopter money and MMT have similar goals. Both are unconventional policies aimed at boosting aggregate demand when conventional monetary policy is unable to gain traction. In theory, both have more impact when monetary policy is already exhausted and policy interest rates are close to zero. If successful, both policies would generate inflation. To that extent, higher inflation would be a measure of their success, not their failure.

They also have similar immediate outcomes. Under both scenarios, the central bank expands its money-printing and greatly increases the stock of reserves in the system. Under helicopter money, this could be credited to the national government or to households, while under MMT it would certainly go directly to the national spending authority. Both may also involve the central bank taking a nominal loss and operating with negative equity; as discussed above, this is not an acute problem.

Both helicopter money and MMT have built-in systems designed to prevent runaway inflation. But the exact mechanisms are different. Helicopter money, being an extension of current unconventional monetary policies, operates similar to the current framework. The central bank removes its accommodation and ultimately raise interest rates to prevent overheating assuming it acted on time and in the appropriate manner.

For MMT though, the swapping of roles between the fiscal and monetary authorities also requires that the fiscal arm of government be willing to tighten policy, by raising taxes or cutting spending, to respond to above-trend growth and inflation. It is not clear if politicians on short election cycles would be disciplined enough to pursue such countercyclical policies. It would be inevitable then that MMT would have an inflationary bias.

Indeed, independent central banks were initially created to address the issue of political interference with macroeconomic policy. To prevent a replay of the 1970s' widespread high inflation, the Fed shifted to an inflation-targeting regime, completely separate and apart from fiscal policy. Since, under MMT, the central bank no longer targets macroeconomic stability, the promise of rate hikes to prevent any inflation is removed. Understandably, the risks of higher inflation would likely be higher under MMT than under the current orthodox institutional setup of independent central banks.

How effective would helicopter money or MMT be?

Both helicopter money and MMT effectively deploy monetary resources via fiscal spending to boost aggregate demand. Accordingly, the key question when analysing either policy's effectiveness regards the fiscal multiplier, i.e. the amount of growth that results from $1 of fiscal spending. The multiplier is usually less than 1.0 as expected interest-rate rises "crowd out" the full impact of the stimulus.

However, when the economy is depressed and interest rates are at zero, fiscal policy can have more traction. If there is a liquidity trap, expansionary monetary policy

alone may have only a limited impact, with fiscal more powerful, especially if interest rates do not initially rise. Economic literature backs this up. A 2011 paper by Christiano, Eichenbaum, and Rebelo estimates that the overall multiplier is around 1.6 under these conditions. This result is corroborated by estimates from the CBO, which has found that the multiplier is around 3x larger when output is below potential and the Fed does not respond with higher rates.

The CBO also estimates the fiscal multiplier for different forms of fiscal expansion. As shown below, direct purchases of goods and services are likely to have the highest multiplier, along with transfer payments to state and local governments, transfer payments to individuals, and tax cuts for lower- and middle-income households. Corporate tax cuts, house-buying credits, and tax cuts for higher-income households are among the weaker forms of expansion. So while Mr Trump's tax cuts have boosted the economy, on the basis of the CBO analysis, the economic boost could have been higher if directed in a different manner. In addition, over the period of the tax cuts, the Fed has mostly been tightening policy and reducing its balance sheet, so – as discussed earlier – this is not a coordinated easing of policy and certainly can't be likened to helicopter money.

Figure 79: CBO estimates (low/high range) of fiscal multiplier for different types of activity

Type of activity	Low	High
Purchases of goods and services by the Federal Government	0.5	2.5
Transfer payments to State and Local Governments for infrastructure	0.4	2.2
Transfer payments to State and Local Governments for other purposes	0.4	1.8
Transfer payments to individuals	0.4	2.1
One-time payments to retirees	0.2	1.0
Two-year tax cuts for lower- and middle-income people	0.9	1.5
One-year tax cut for higher-income people	0.1	0.6
Extension of first-time homebuyer credit	0.2	0.8
Corporate tax provisions primarily affecting cash flow	0.0	0.4

Source : Deutsche Bank, CBO

Taking all of this together, we believe that helicopter money could be highly effective if properly deployed, especially in conditions akin to a liquidity trap in many countries. Direct payments to lower- and middle-income consumers would likely have more impact than other forms of spending, though federal spending could be useful if targeted appropriately. The same guidelines apply to MMT. Different forms of spending would have different effects. However, the use of fiscal policy to countercyclically tighten policy is uncharted territory, and it is not clear what avenues would be the most economically/politically viable. However, that's an issue for the overheating stage.

MMT advocates view it as a total regime shift, towards using fiscal policy as the key lever for influencing aggregate demand instead of monetary policy. This is not just a policy framework to deploy in a crisis or a liquidity trap; its proponents view it as a policy for all seasons. As discussed above, the efficacy of fiscal expansion falls and the multiplier sinks below 1.0 when the economy is not in a liquidity trap. Accordingly, using fiscal policy in these environments is likely to be less effective, if not counterproductive.

Helicopter Money/MMT in Europe

Much of the intellectual debate around these more extreme forms of debt financing has taken place in the US, but the policies are actually more applicable in Europe, even if it will be far more difficult to implement politically. The fiscal situation in

Europe is more interesting for two reasons: 1) there are codified rules at the European level dictating how high debt can rise and to what extent the deficit can be negative, and 2) with monetary policy much more constrained by the zero lower bound in Europe than in the US, there is greater scope for fiscal policy to boost aggregate demand.

The fiscal rules under the Maastricht treaty bar deficits above 3% of GDP or debt levels over 60% of GDP. Our European economists have analysed the fiscal space available to European countries under the current political institutional framework (see report here), and conclude that in aggregate, European fiscal authorities have around 0.7pp of GDP in available fiscal space. Most of that space is in Germany. In the event of an adverse shock, e.g. a no-deal Brexit, fiscal authorities could respond with greater easing, maybe as much as 2.5pp of GDP, taking the overall fiscal deficit from 0.5% in 2018 to 3.0%.

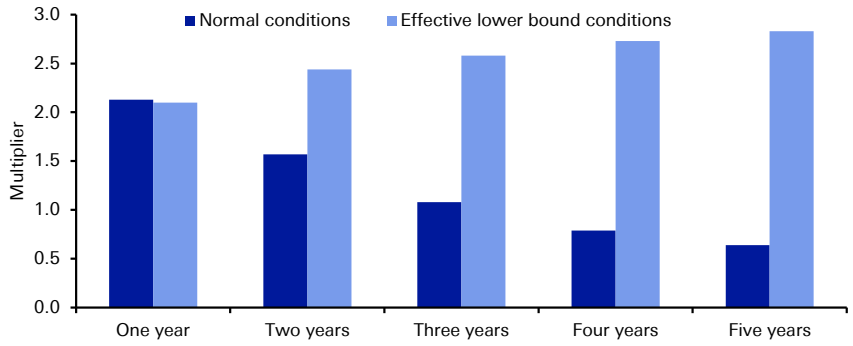
These figures suggest that a wholesale shift toward greater fiscal expansion is not compatible with the existing institutional arrangement. To enable higher deficits and greater fiscal support, European countries would need to strengthen their solidarity, possibly by implementing something like French President Macron's proposal for a common euro area budget. At the same time, reforms would need to be balanced by some additional sacrificing of sovereignty. The available resources (i.e. solidarity) must be offset by higher costs of access (i.e. sacrificing sovereignty).

The political outlook on this front is uncertain. The most recent European Parliament elections showed relatively high support for populists and the Greens. The former group is more nationalistic and unlikely to support unified fiscal policy but could support higher domestic spending. The latter is interested in expanded spending on environmental priorities, which could be growth negative. At the same time, there is an increasing divergence between southern and northern European countries. The latter, self-styled the New Hanseatic League, have formally coordinated on policy. While they support greater capital markets integration, they want stricter enforcement of fiscal rules to compensate. The outlook for European fiscal policy will likely hinge on how the configuration of national and region-wide politics is resolved over the next few years.

All of these constraints are especially unfortunate, since now seems an opportune time for European fiscal expansion, and even for helicopter money/MMT-type policies. Recall that MMT swaps the management of aggregate demand, designating fiscal policy as the key policy lever instead of monetary policy. This is especially relevant and potentially most useful in Europe, where monetary policy is reaching the edges of its effective limits.

As discussed above, the fiscal multiplier is usually higher when the economy is operating below potential and monetary policy is constrained by the zero lower bound. The IMF recently published research estimating the multiplier for Europe under normal conditions, i.e. interest rates well above zero, and under effective lower bound conditions, i.e. the current environment with policy rates below zero. The results are shown in the chart below, and while it's very difficult to calculate where we currently are on the normal to lower bound scale, we are probably closer to the latter where the fiscal multiplier is likely to be much higher even if levels above 2 seem very high.

Figure 80: The fiscal multiplier in Europe is estimated by the IMF to be persistently higher when at the effective lower bound



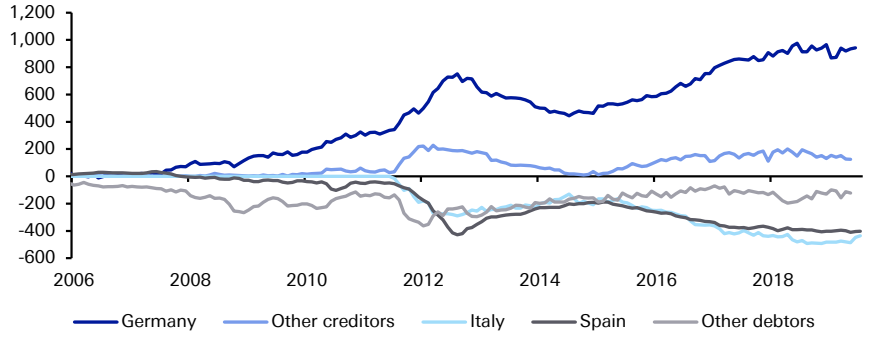
Source : Deutsche Bank, IMF

Regardless of the exact level, similar to the CBO estimates, the multiplier is likely ~2.5x larger when monetary policy is constrained by the effective lower bound. The IMF's estimate also illustrates how the multiplier typically evolves over time: spending is almost always stimulative in the short term, but in usual conditions, the central bank offsets the boost by raising interest rates, leading to a multiplier less than 1 over the following years. Fiscal spending therefore drags consumption forward, but does not boost overall consumption across multiple years. When rates are around zero though, the fiscal stimulus raises output by more than the initial cost of the spending, for many years into the future.

The theoretical case for helicopter money/MMT in Europe is therefore quite interesting, plausible, and one to consider. However, apart from, and in addition to, the political roadblocks, institutional factors would make this difficult. Whereas in the US, the Federal Reserve can simply create bank reserves to accommodate wider fiscal deficits, the euro area has a complicated system of interlocking national central banks. It would likely be possible for the Eurosystem to implement a helicopter money/MMT-like system, but it would likely require further socialising of risks.

In the euro area, the national central banks maintain "Target II" balances with the ECB. The national central banks in some countries have net claims on the broader Eurosystem, while some have liabilities. The chart below shows these positions by country.

Figure 81: Target II balances (€bn)



Source : Deutsche Bank, Bloomberg Finance LP

For example, if the ECB wants to lend to an Italian commercial bank under its long-term refinancing operations programme, the Bank of Italy actually makes the loan and accrues a corresponding liability to the Eurosystem. Often, the commercial bank will then lend out the new reserves, and often they will wind up in Northern European banks, e.g. a German bank. When the German bank gains reserves, the Bundesbank accrues an asset versus the Eurosystem, corresponding to and offsetting the Bank of Italy's liability.

Under MMT-type policies, the central bank creates reserves to accommodate fiscal spending. In Europe, this would likely result in even wider Target II imbalances. Countries with large fiscal deficits, like Italy (2018 deficit of -2.1% of GDP), France (-2.5%), and Spain (-2.5%), would likely lean on their central banks for additional reserve creation. On the other hand, surplus countries like Germany (+1.7%) and the Netherlands (+1.5%), would not need as much monetary support.

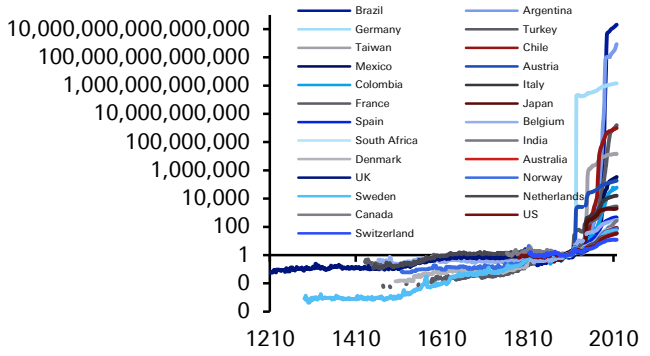
If MMT-type policies were implemented, the Target II imbalances would likely widen, presenting a potential complication to achieving political support. In the unlikely event that a country exited the Eurosystem, it could effectively renege on its Target II commitments, or try to pay them back in a devalued currency. This would present a further layer of complexity on top of the already difficult task of achieving a European consensus on fiscal policy.

Central banks and fiat money allow for helicopter money if politics desire it

The Bank of England was the first central bank to be set up, in 1694. It was established to finance the government's funding of the war effort against France. Central banks have replicated such endeavours over the following centuries and across many different countries. However, their role and purpose has changed over time and we shouldn't be surprised to see their function and responsibilities change again. Since the financial crisis, their policy responses have dramatically evolved, and while the accumulation of assets on their balance sheets is in aggregate greater than it has ever been at a global level, individual central banks have been as aggressive as this through history.

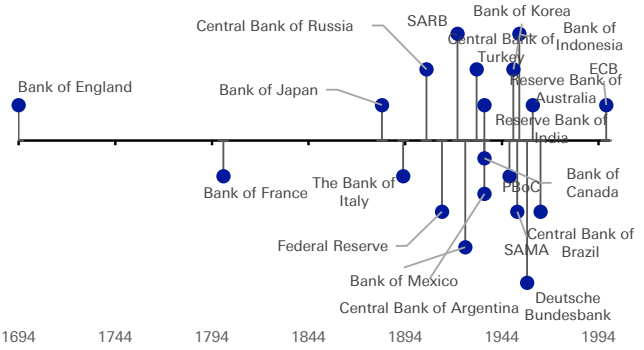
We only have to look at two charts from last year's long-term study in Figure 82 and Figure 83 to show that modern history is full of examples of how the price level has risen in an exponential manner in many countries around the world. It's perhaps not a coincidence that this last century or so has seen the establishment of most of the central banks in existence today.

Figure 82: Inflation price series (log-scale)



Source : Deutsche Bank, GFD

Figure 83: Timeline of G20 central banks coming into existence



Source : Deutsche Bank

In the gaps between precious metal membership regimes, these central banks typically facilitated more money being pumped into domestic economies. Indeed, since 1971, virtually all global money is essentially fiat money with nothing backing it. So the infrastructure to create inflation and/or higher nominal activity is without a doubt in place. It now depends on policy and political will. The next global recession will likely bring a realisation that cutting rates further and conducting post-2008-style QE alone will unlikely be enough to move the dial. This will likely provide the cover for such radical policy changes.

In countries with sizeable ageing populations and high savings rates, there may be more political resistance to such policies (e.g. Japan and Germany), but in many countries the clamour will likely grow for more radical and more redistributional policies. In Japan the BoJ has already given the government the keys to the helicopter but as Figure 78 showed, the politicians have yet to properly get on board, even though the rotors are running. Germany will likely face a more difficult internal battle in the years ahead, as the pressure for more fiscal spending will perhaps be less internally driven but more from other European countries wanting to create more aggregate demand in the Euro area.

What are the risks to such a new policy era?

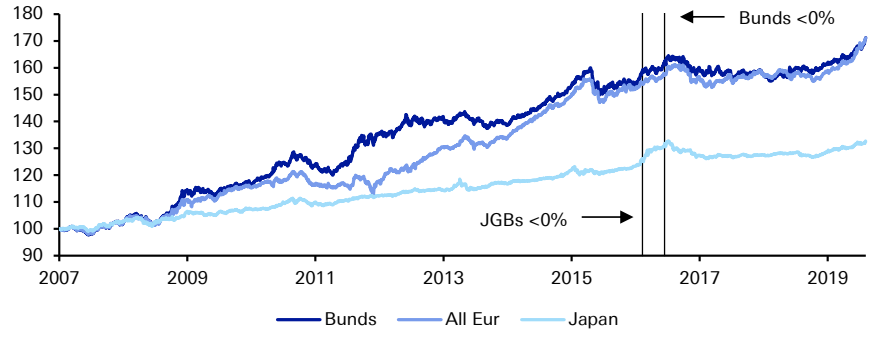
Put very simply, when debt is already at high levels, helicopter money or MMT-type policies have a chance of working for the economy only if they can create a scenario where real yields stay negative (preferably by a decent margin) and nominal GDP growth stays comfortably above nominal yields. The aim is to increase nominal GDP without increasing nominal yields by as much (if at all, but that might be unrealistic). So the era of financial repression will need to stay and central banks will need to be aggressive. In an ideal world, you would increase real GDP, but that is as much a function of demographics and productivity. We have to assume demographics are generally getting worse across the MDW and that structural reforms are not only difficult but will generally move the needle by only a few tenths of a percentage point for most countries. As we hinted earlier, excess debt in the system might in itself be holding productivity back. So managing this debt burden relative to GDP might be the key to unlocking some productivity gains.

The negative yield regime is yet to be tested

One of the great unknowns of this period of ultra-low/negative yields is what happens if and when the momentum of regular fresh all-time yield lows stop. It's all very

well to comment on the madness of investors buying securities with a negative yield, but if they have so far continually made positive returns due to someone being able to buy it off them at even lower negative yields, then at face value these have been good investments. Figure 84 shows the total return of Bunds, European governments overall and JGBs since 2007.

Figure 84: Total returns of Bunds, Eur Govs and JGBs since 2007



Source : Deutsche Bank, BofAML/ICE

Even during the period of negative yields, it's remarkable that nominal returns have continually headed higher. This surely helps with the ease of funding as investors are yet to be punished for taking such extreme yield-to-maturity risk. It does feel like a pyramid scheme in some ways though, as to ensure continued positive total returns and to attract new investment, yields must keep falling. This is clearly possible, but where is the limit? Yields at -1%, -2%, -5%? This won't matter to non-price/return-sensitive investors, but there remains a substantial free float of investments (albeit lower than in the past) where it *will* matter.

If price-sensitive investors do eventually revolt, and if the maintenance of deeply negative real yields (and yields comfortably below NGDP) remains a key policy goal, then central banks may have to massively step up their purchases of government bonds.

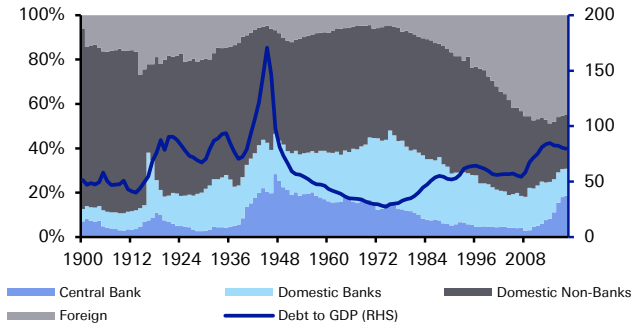
Evolution of Government bond holders over time and why it matters

The exact investor base holding government debt is hugely important. Different classes of investor have different objectives, sensitivities, and guidelines. If debt levels are set to rise over the next several years, will investors still purchase the new issuances? Will they demand higher yields? Or do they have different priorities that make them less concerned about yield levels? In recent years, investors who are less sensitive to interest rates have gained prominence, namely central banks, official reserve managers, and pensions/insurance funds. Can this move towards price-insensitive investors survive into the future?

Figure 85 and Figure 86 below show the long history of government debt holders across developed markets, in aggregate. Two recent trends are noteworthy. First, central bank holdings of government debt have risen steeply over the last decade, similar to the experience during World War II, and are back near the historical highs. Second, the foreign sector has become increasingly important since the late 1970s, in line with the broader trends in financial and trade globalisation. This group

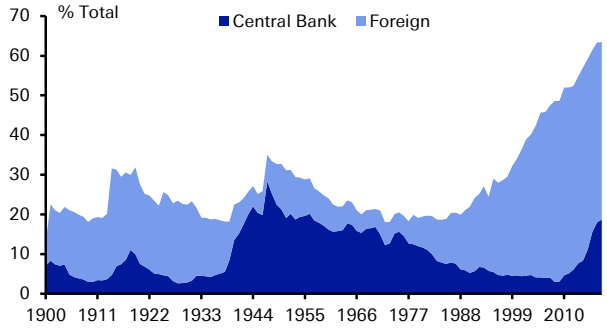
includes official flows, like central banks, governments, and reserve managers, but also includes private capital flows, like banks and pension funds. As a result of these two trends, domestic investors, including banks, households, and non-financial corporations, have seen their share of holdings fall to less than half of the total – the lowest share on record.

Figure 85: Holdings of government debt over time



Source : Deutsche Bank, Blackrock Investment Institute, IMF

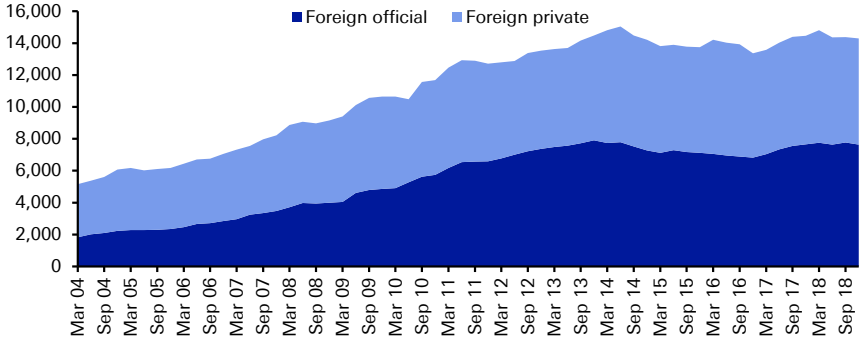
Figure 86: The foreign sector and domestic central banks own the vast majority of DM public debt



Source : Deutsche Bank, Blackrock Investment Institute, IMF

Of the foreign holdings, it is difficult to determine the exact historical breakdown between public and private investors. We do have reasonably good data for the last one to two decades, which shows that foreign official holdings of developed market government debt have been growing faster than foreign private holdings. The charts below show that foreign holdings of DM debt have risen by over $9 trillion over the last 15 years, from around $5 trillion to over $14 trillion. Of that increase, almost $6 trillion, or 64%, was driven by official institutions. Official investors now make up over half of the overall foreign holdings of DM government debt.

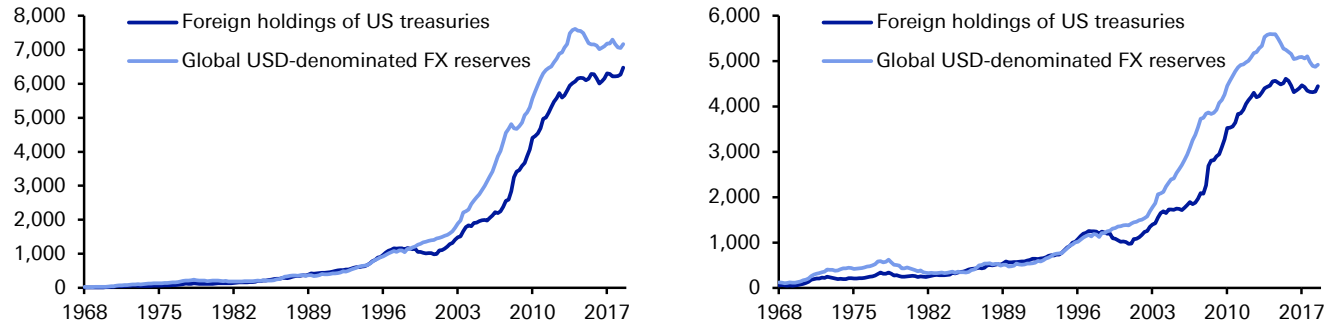
Figure 87: The foreign official sector has driven most of the increase in foreign holdings of DM government bonds



Source : Deutsche Bank, Haver, Bloomberg Finance LP

For the countries that have seen big increases in official foreign holdings, the overwhelming driver has been foreign exchange reserve accumulation by emerging markets. As shown below, the rise in US dollar reserve holdings has coincided neatly with a buildup in foreign holdings of US treasury securities. The big rise in recent years is evident in either nominal or inflation-adjusted figures.

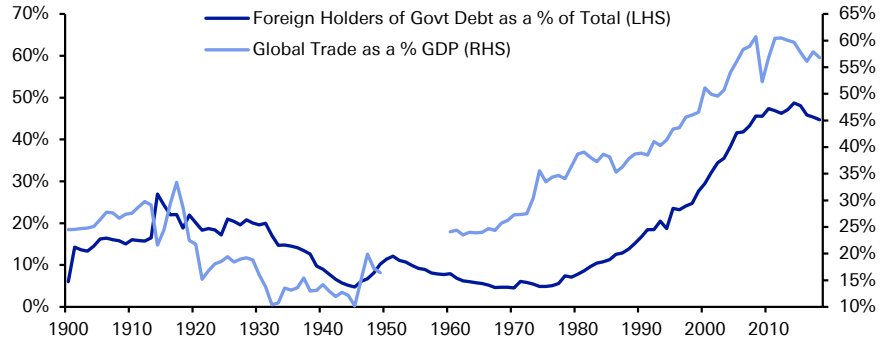
Figure 88: Foreign holdings of Treasuries and foreign official reserves in USD have risen in tandem - nominal (left) and in 2000 constant dollars (right) ($bn)



Source : Deutsche Bank, Federal Reserve, IMF

Figure 89 highlights that the ebbing and flowing of global trade through history has been strongly correlated to foreign holdings of government debt. The surge in globalisation over the last four decades seems to have coincided with the surge of such holdings.

Figure 89:Global Trade as % of GDP and Foreign Holders of Govt. Debt as % of Total

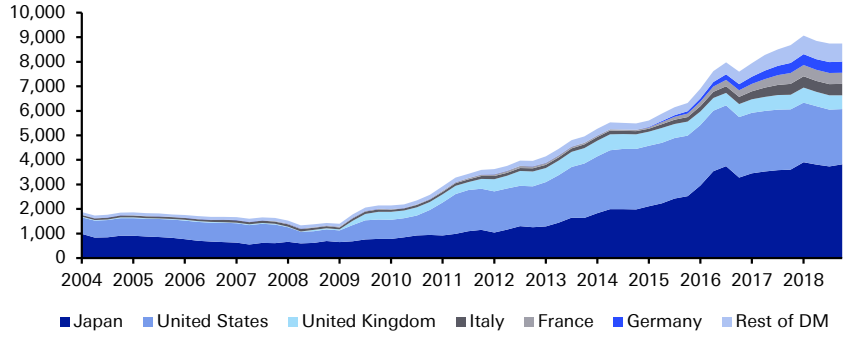


Source : Deutsche Bank, Blackrock Investment Institute, IMF

Interestingly the graph shows that since global trade as a share of GDP plateaued around the time of the GFC, so has the percentage holdings of government bonds from the foreign sector. Although correlation does not equal causality, there is good evidence to suggest that the foreign sector's participation in government debt in the future could be linked to the outcome of the current trade war and general backlash against globalisation. Figure 86 already shows that when you look at domestic central bank and foreign ownership holdings, the former has seen rapid growth over the last decade, whilst the latter has stayed broadly constant at high levels. If governments do increase fiscal spending and want to maintain ultra-low yields, central banks will likely still need to do more of the marginal buying, especially in a world where globalisation is not the same force as it was between the late 1970s and the GFC.

In aggregate, domestic central banks have already added $6.9 trillion to their balance sheets by buying debt, taking the total to over $8.7 trillion from under $2 trillion before the crisis. Of that increase, the Fed has been responsible for 41%, or $2.8 trillion, and the BoJ has been responsible for 23%, or $1.6 trillion.

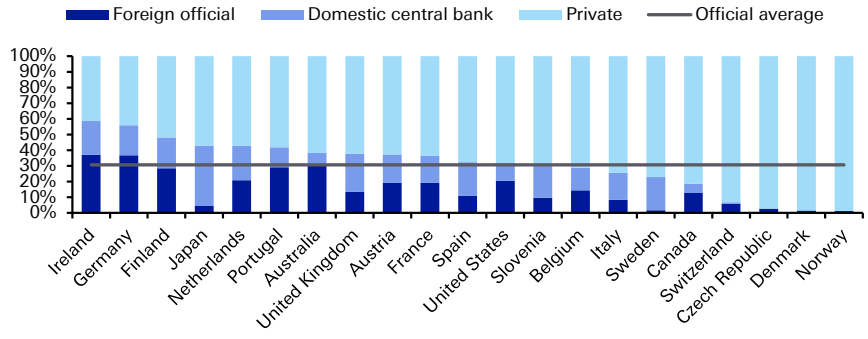
Figure 90: Central banks have almost quadrupled their holdings over the last decade ($bn)



Source : Deutsche Bank, IMF

Taking these two investor groups together, i.e. foreign official investors and domestic central banks, we see that public institutions are very influential over public debt markets. Across DM, these two segments encompass an average of 30% of the outstanding government debt. The US is right around average, while Germany, Japan, and France are all above average.

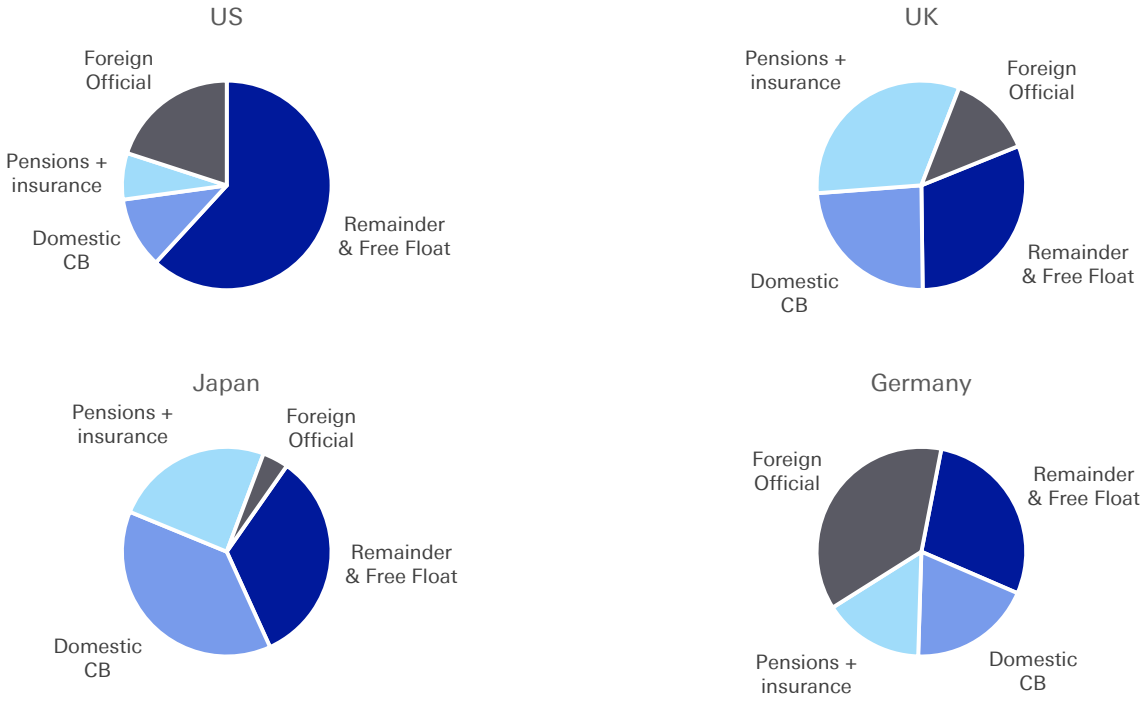
Figure 91: Foreign official + domestic central bank holdings of government debt average around 30% of the market



Source : Deutsche Bank, IMF

A third class of investor is also influential in government bond markets: pension and insurance funds. Like central banks and reserve managers, they are often forced to invest in long-term, safe instruments. That often pushes them to buy government bonds. The pie charts below split the government bond markets into four segments: domestic central banks, official foreign institutions, pension/insurance funds, and the remainder. That fourth quadrant, the 'remainder and free float' segment of the market, held by banks, investors, and households, is now relatively small in some major markets.

Figure 92: Estimates of holdings of government bonds in major countries by investor type



Source : Deutsche Bank, Federal Reserve, ONS, BoJ, Bundesbank, IMF

So with the volume of price-insensitive investors growing over time, governments continue to have attractive funding opportunities that haven't always been present through history. The so-called bond vigilantes of the late twentieth century, who responded to fundamentals and punished profligate governments, have been displaced by a new class of investors who simply – whether for legal, liquidity, or safety reasons – do not care as much about those fundamentals. This will help fund the world's mountain of debt, but we suspect that domestic central banks may have to do even more of the funding.

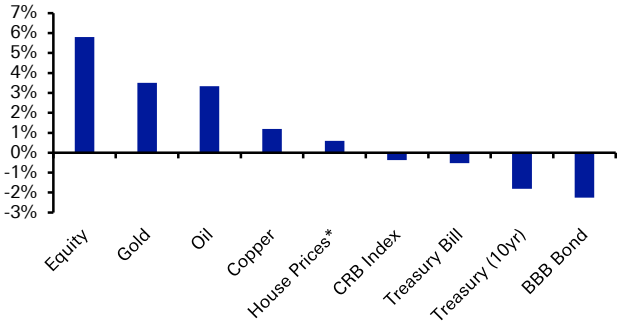
Investment Implications

Although the future is highly uncertain, this report suggests that the most likely scenario over the years, or even decades, ahead is for a long period during which yields are comfortably below inflation and nominal GDP. We expect that governments will eventually accept the invitation of low/negative yields and issue more debt to try to grow nominal GDP. At this stage, central banks will likely need to buy more government debt to ensure the success of this policy. Whether this is called helicopter money or MMT is less relevant, but essentially we will move from a period (post-GFC) when money was printed to buy government bonds to a period when money will be printed to effectively finance spending in the economy. So there will be even more debt in the global economy relative to GDP than we have today, or – at best – we might maintain current high debt levels if countries are uber-aggressive on financial repression. This will likely be most effective if the authorities can ensure that we have much lower yields than nominal GDP, mirroring the 1946-1980 period.

With that in mind, it's worth examining this 1946-1980 period for investment returns – in comparison with long-term annualised real returns. Clearly the two periods have many differences, but it gives us some context to judge potential investment implications.

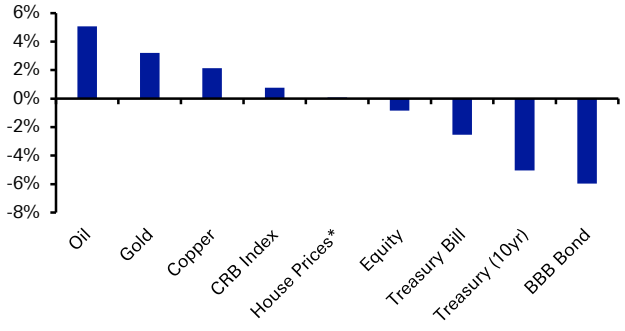
Figure 93 shows annualised real returns over this period for dollar-based assets, and Figure 94 shows how this differed from each asset's long-term return.

Figure 93: US assets annualised real returns 1946-1980...



*Note: * Price only, no income*
Source : Deutsche Bank, GFD

Figure 94: ...vs. long-term annualised real returns



*Note: * Price only, no income*
Source : Deutsche Bank, GFD

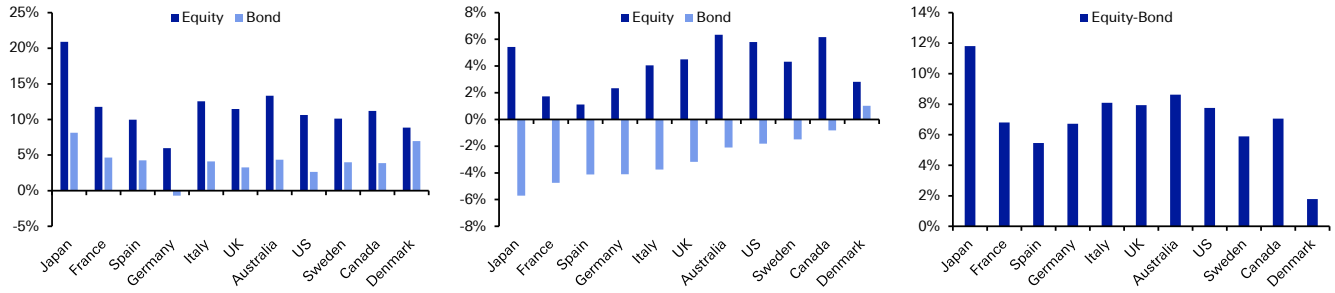
Over such a long period, it would be strange if equities were not the best performer, but the real returns were very slightly below their long-term average. It's no surprise given everything we've discussed in this report, to see very poor real returns in fixed income – -1.8% p.a. for 10-year Treasuries - shocking levels of wealth destruction in real terms. BBB returns are more negative, but our series has a 30-year duration so the comparision is slightly misleading. As discussed below, in any recurrence of such a period, we'd expect credit to outperform Treasuries (duration matched) by more than the long-term history as we'd expect low defaults in such a period.

On the positive side, commodities – particularly oil and gold – outperformed their long-term average returns by c. 5% p.a. and c.3% p.a. for three and a half decades, respectively. So on a relative basis, commodities will likely be the biggest winner.

Given gold's historic store of value as a currency, it's easy to see how this could be a sought-after asset in the years ahead. In a modern twist, the appeal of alternative digital currencies may also build. The closer we get to full-blown helicopter money, the more we will likely see the rise of crypto currencies.

So hard assets and alternative currencies should be the investment bias.

Figure 95: Annualised equity vs. bond returns by country 1946-1980 - nominal (left), real (middle) and equity-bond (right)

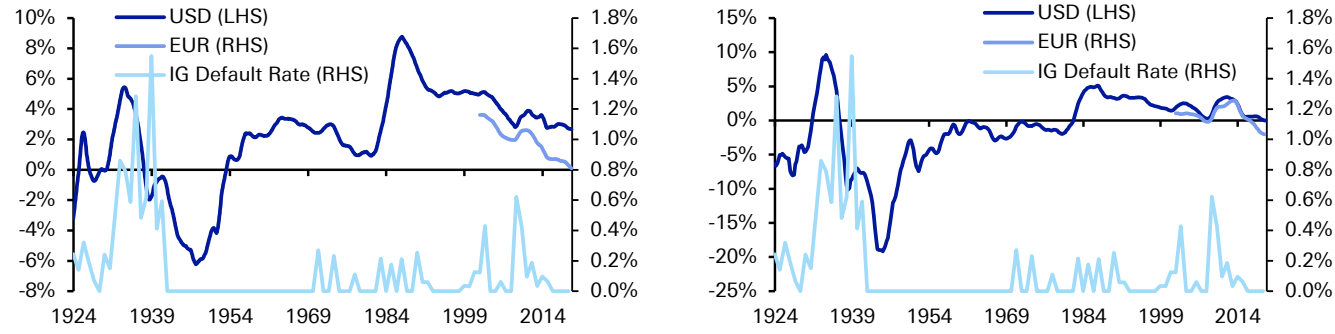


Source : Deutsche Bank, GFD

A world of ultra-low defaults?

One of the implications of real yields remaining negative for a prolonged time is that default rates for non-government entities should stay structurally very low – notwithstanding any temporary rises with recessions. Figure 96 shows IG default rates over the last century versus both real IG yields and IG yields minus nominal GDP. Although a slightly sweeping analysis, there is strong evidence to suggest that defaults have been structurally much lower when yields are well below inflation and nominal activity. The opposite is also true.

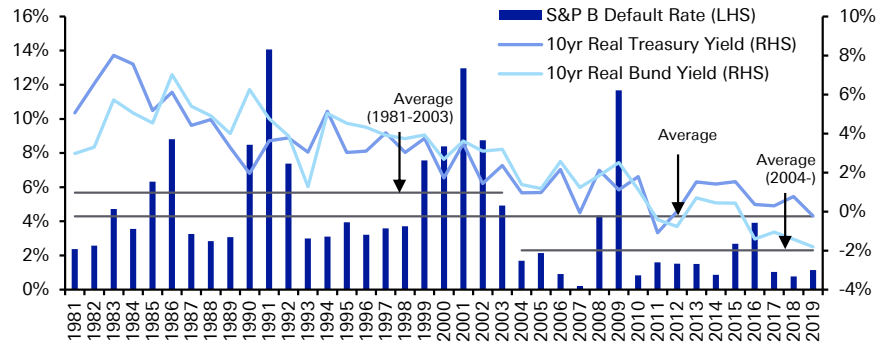
Figure 96: IG Annual Default Rate vs. 5yr Moving Average IG Real Yields (left) and IG Yields - Nominal GDP (right)



Source : Deutsche Bank, Bloomberg Finance LP, GFD, Moody's

The problem with doing this, for IG issuers, is that IG defaults are very rare and mostly concentrated around recessions. You get a better feel for the structural decline in defaults in a lower-real-yield world in Figure 97, which shows single-B defaults since the HY market began to have critical mass in the early 1980s. In an era of collapsing real yields, defaults have collapsed too, even though real growth rates have been increasingly disappointing.

Figure 97: Single-B Annual Default Rates vs. Real 10yr Treasury and Bund Yields



Source : Deutsche Bank, Bloomberg Finance LP, S&P

So a long period of negative real yields and nominal corporate yields being below nominal GDP will likely bring structurally low defaults with the possibility of higher excess returns for corporate bonds. Within a poor outlook for fixed income, credit should outperform governments by more than the long-term average rate given that defaults should stay lower than average.

In general, though, it feels like an environment where issuers of debt should try to fix in ultra-low, ultra-long funding – and investors should avoid buying it.

Is that a sustainable equilibrium?

Historical Asset Returns

The following pages are our data section, where we examine long-term US returns going back to the start of the nineteenth century (where possible). In addition, we look at various international returns for equities and bonds for as far back as we have data. For many countries, this stretches back deep into the early 1900s, and for some countries the data goes back over 200 years. We show returns in nominal and real terms, and for the international section we convert all returns into dollars for the sake of comparison. We also show returns annualised within each decade and by 50-year buckets. Additionally, we detail returns from certain starting points. With these different starting points, we can hopefully see cyclical, secular and very long-term trends.

First the US. Figure 98 and Figure 99 show why we invest in assets over the medium to long term. Data going back over 200 years shows that storing cash under the mattress has been a recipe for wealth erosion throughout history in all but the most exceptional international circumstances.

Over the entire sample period, US equities have outperformed corporate bonds, which have outperformed government bonds, which have outperformed cash, which interestingly has generally outperformed the commodities analysed in this section. Over the last 100 years (since end 1919, where we have data for the widest selection of assets), equities have outperformed 10yr and 30yr governments by around +4.5% p.a., corporates by +3.6% p.a. and T-bills (cash proxy) by +6.4% p.a. They have also outperformed gold by 5.5% p.a., oil by 7.5%, and US housing (prices only) by 6.1% p.a. Indeed, in real terms, over the past 100 years, commodities have generally seen negative returns. Within our small sample, only gold (+1.7% p.a.) and copper (+0.03% p.a.) have seen positive real returns, while the overall commodity index has seen an annualised real return of -1.3% p.a. Housing (+1.1% p.a.) has also seen a positive real return, but this is still underwhelming compared to equities (+7.3% p.a.), 10yr treasuries (+2.5% p.a.) and corporate bonds (+3.5% p.a.). Over recent years, assets like housing (to live in, not rent out) and commodities have been used as a portfolio alternative to equities and bonds. History suggests that over the long run, such a strategy is unlikely to produce superior results, especially relative to equities. Their lack of income make it difficult for them to compete with traditional assets. Buy-to-let housing would be more competitive, but there is no long-term data series available to analyse this.

Since 1800, US equities have had only two negative decades in nominal terms: the 1930s (-0.5% p.a.) and the 2000s (-0.9% p.a.); there have been only three in real terms (1910s: -2.8%, 1970s: -1.5%, 2000s: -3.4%).

In nominal terms three of the best five decades for equities since 1900 have occurred in the last four decades (including the current decade). However, this period also included the worst decade (the 2000s).

Interestingly, 10-year Treasuries and corporate bonds have never seen a negative return decade in nominal terms. But in real terms, six of the 12 decades since 1900 have seen a negative return from 10-year Treasuries, including four successive decades from the 1940s. After this, the last four decades have seen positive real returns for bonds. That said, with each decade, we have seen these annualized returns decline, and – as we have highlighted in this note – we can't help thinking that we're

setting ourselves up for a return to a few negative real return decades ahead in bonds as we venture towards 2050.

International Returns

Fixed income is the asset class for which we have the longest-dated data series globally. There is definitely a survivor bias in bonds, though. Although the majority of countries (data back to 1900) in our study have provided positive real returns over this period, there have been some notable exceptions, with France (-1.2% p.a.), Italy (-1.8% p.a.) and Japan (-0.6% p.a.) all seeing negative real returns. Germany would be the worst if we had reliable data through the hyperinflation period in the 1920s. This shows that negative real returns in bonds are a real possibility over even very long periods of time. Negative real returns are also usually difficult to reverse once they've occurred.

For equities we have comprehensive returns data for only a critical mass of countries post WWII; over the last 50 years, around half of the developed markets saw real annualised returns of +5-6.5% p.a. The only notable laggard is Italy (+1.4% p.a.), although Austria, Japan, and Spain have all provided annualised real returns of less than +4%.

Since the Euro was introduced in 1999, there is little doubt that equity returns in Europe have been disappointing. However, this period did coincide with the global equity market bubble, so returns are best compared using the US and UK (+4.0% and +3.3% p.a. real adjusted, respectively) for context. Only Austria and France have outperformed the US, with the remainder of the Eurozone countries in our analysis underperforming the UK in real terms. Portugal (-0.6% p.a.) has actually failed to provide positive real returns since the introduction of the single currency more than 20 years ago. Although it is not included in this analysis, the same would also be true for Greece. In addition, both Italy and Spain have seen real returns of less than +1%, and Ireland has only mustered +1.3% annualised real returns. Such poor returns for the peripheral Eurozone economies' equity markets, especially those still in negative territory after more than 20 years, is a worrying statistic for the supporters of the single currency.

Government bond returns since the Euro commenced are strong across the board due to the themes explored in this and previous reports, with investors having central banks to thank for this in the weakest Euro area countries. Without their intervention it's possible we would have seen sovereign defaults over and above the haircuts that investors took in Greece. This would have wiped out returns in fixed income that, as history shows, are hard to get back even over the very long term.

We also include tables using similar time frames to show long-term nominal and real GDP for a host of DM and EM countries. We've also converted into dollars to allow some comparison through time.

The full data is shown in the following pages, covering nominal and real returns and including a shorter history for various EM countries. For all returns we also show nominal returns through time in dollar terms. For visual ease, we have shaded the periods of negative returns.

Figure 98: Nominal returns for US assets over different time horizons

	Equity	Corp Bond	AAA Bond	BBB Bond	Treasury (10yr)	Treasury (30yr)	HY Bond	Treasury (HY Matched)	Treasury Bill	House Prices (Price Only)	Gold	Copper	Oil	Wheat	Commodities (CRB Index)
last 5yrs (2015-2019)	9.37%	6.77%	6.71%	7.34%	3.36%	5.93%	5.52%	2.20%	0.97%	4.82%	5.13%	-2.20%	0.60%	-5.24%	-5.82%
last 10yrs (2010-2019)	12.37%	8.38%	8.08%	8.75%	4.43%	8.01%	7.19%	2.50%	0.52%	3.69%	3.33%	-2.15%	-3.59%	1.16%	-4.96%
last 15yrs (2005-2019)	8.24%	7.39%	7.21%	7.51%	4.55%	6.66%	6.91%	3.31%	1.28%	1.91%	8.65%	3.54%	1.61%	1.82%	-3.35%
last 25yrs (1995-2019)	9.75%	8.69%	8.54%	8.86%	6.00%	7.89%	7.45%	4.99%	2.31%	3.95%	5.67%	2.44%	4.63%	0.49%	0.94%
last 50yrs (1970-2019)	10.33%	9.09%	8.75%	9.49%	7.50%	7.92%			4.72%	5.03%	7.82%	3.13%	5.85%	2.26%	2.40%
last 75yrs (1945-2019)	11.13%	6.29%	5.97%	6.71%	5.49%	5.42%			4.00%	4.74%	5.11%	4.20%	4.21%	1.34%	2.06%
last 100yrs (1920-2019)	10.09%	6.28%	6.04%	6.76%	5.23%	5.31%			3.45%	3.72%	4.39%	2.67%	2.43%	0.62%	1.34%
last 150yrs (1870-2019)	8.91%				4.74%				3.32%		2.78%	1.41%	1.60%	1.19%	
last 200yrs (1820-2019)	8.65%				4.94%				3.65%		2.20%	1.12%			
since 1800	8.59%				5.17%				3.78%		2.00%	0.73%			
since 1900	9.59%	5.81%			4.67%	4.81%			3.36%	3.53%	3.65%	2.19%	2.97%	1.60%	
since 1920	10.09%	6.28%	6.04%	6.76%	5.23%	5.31%			3.45%	3.72%	4.39%	2.67%	2.43%	0.62%	1.34%
since 1930	9.58%	6.23%	5.99%	6.69%	5.18%	5.23%			3.40%	4.07%	4.89%	3.03%	3.29%	1.41%	1.99%
1900-2019	9.59%	5.81%			4.67%	4.81%			3.36%	3.53%	3.65%	2.19%	2.97%	1.60%	
since 1971	10.46%	9.17%	8.75%	9.62%	7.28%	7.80%			4.69%	4.97%	7.86%	3.31%	5.84%	2.00%	2.48%
since 1980	11.50%	10.05%	9.70%	10.42%	7.85%	9.00%			4.29%	4.30%	2.76%	2.36%	0.93%	0.09%	0.47%
since 1985	11.05%	9.92%	9.64%	10.20%	7.35%	8.98%	8.80%	6.45%	3.32%	4.16%	4.66%	4.15%	2.12%	0.66%	0.95%
since 1999	6.19%	7.83%	7.53%	8.08%	4.76%	6.45%	6.64%	3.88%	1.77%	4.00%	8.24%	6.28%	7.47%	2.93%	1.47%
RETURNS BY DECADE															
1800-1809	11.09%				8.74%				5.16%		0.00%	-1.62%			
1810-1819	4.91%				6.22%				5.07%		0.00%	-4.63%			
1820-1829	6.94%				5.67%				3.80%		0.00%	-1.63%			
1830-1839	5.34%				2.14%				4.29%		0.67%	1.38%			
1840-1849	7.83%				7.76%				5.02%		-0.03%	-2.57%			
1850-1859	1.62%				5.25%				5.08%		0.00%	2.35%		5.70%	
1860-1869	18.34%				6.96%				5.04%		1.81%	1.90%	-12.73%	-1.80%	
1870-1879	7.73%				6.14%				4.11%		-1.78%	-2.05%	-14.26%	5.23%	
1880-1889	5.68%				5.50%				3.04%		0.00%	-1.66%	-0.70%	-5.09%	
1890-1899	5.37%				3.44%				2.33%		0.00%	-1.26%	4.88%	-1.21%	
1900-1909	9.92%	4.39%			1.64%	2.17%			3.04%	1.97%	0.00%	-3.55%	-1.43%	6.06%	
1910-1919	4.35%	2.62%			2.27%	2.52%			2.73%	3.15%	0.00%	3.34%	13.33%	7.19%	
1920-1929	14.78%	6.73%	6.52%	7.31%	5.65%	6.05%			3.88%	0.65%	0.00%	-0.48%	-4.98%	-6.18%	-4.33%
1930-1939	-0.47%	6.47%	7.48%	6.42%	4.11%	5.49%			0.58%	-1.21%	5.41%	-3.51%	-1.81%	-2.22%	-0.70%
1940-1949	8.99%	3.92%	2.92%	5.44%	2.59%	2.42%			0.48%	8.12%	1.47%	4.00%	0.28%	7.64%	5.90%
1950-1959	19.26%	0.16%	-0.08%	0.59%	0.39%	-0.50%			2.02%	2.97%	-1.38%	5.96%	1.46%	-0.69%	0.62%
1960-1969	7.76%	0.57%	0.42%	0.89%	2.36%	0.51%			4.06%	1.85%	-0.01%	5.43%	0.78%	-2.96%	0.24%
1970-1979	5.77%	5.34%	5.02%	5.85%	6.08%	3.71%			6.48%	7.99%	30.70%	6.28%	28.04%	11.43%	10.48%
1980-1989	17.47%	13.72%	13.03%	14.44%	12.78%	12.64%			9.13%	6.94%	-2.37%	0.57%	-5.40%	-0.74%	-2.00%
1990-1999	18.21%	9.30%	8.84%	9.96%	7.98%	8.40%	11.21%	7.34%	4.95%	2.67%	-3.32%	-2.12%	1.67%	-6.31%	3.19%
2000-2009	-0.95%	8.87%	8.91%	8.62%	6.40%	7.03%	6.52%	6.18%	2.74%	3.95%	14.32%	13.96%	11.91%	6.67%	6.04%
2010-2019	12.37%	8.38%	8.08%	8.75%	4.43%	8.01%	7.19%	2.50%	0.52%	3.69%	3.33%	-2.15%	-3.59%	1.16%	-4.96%
RETURNS BY HALF CENTURY															
1800-1849	7.20%				6.08%				4.67%		0.13%	-1.83%			
1850-1899	7.61%				5.46%				3.91%		0.00%	-0.16%		0.48%	
1900-1949	7.39%	4.81%			3.24%	3.72%			2.13%	2.49%	1.35%	-0.09%	0.89%	2.34%	
1950-1999	13.55%	5.69%	5.33%	6.21%	5.83%	4.84%			5.30%	4.46%	4.00%	3.17%	4.72%	-0.03%	2.42%
2000-2019	5.50%	8.63%	8.49%	8.69%	5.41%	7.52%	6.85%	4.32%	1.62%	3.82%	8.68%	5.60%	3.87%	3.88%	0.39%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 99: Real returns for US assets over different time horizons

	Equity	Corp Bond	AAA Bond	BBB Bond	Treasury (10yr)	Treasury (30yr)	HY Bond	Treasury (HY Matched)	Treasury Bill	House Prices (Price Only)	Gold	Copper	Oil	Wheat	Commodities (CRB Index)
last 5yrs (2015-2019)	7.59%	5.04%	4.98%	5.59%	1.68%	4.21%	3.80%	0.54%	-0.67%	3.12%	3.42%	-3.78%	-1.04%	-6.78%	-7.35%
last 10yrs (2010-2019)	10.53%	6.61%	6.31%	6.96%	2.72%	6.24%	5.43%	0.82%	-1.13%	1.99%	1.63%	-3.75%	-5.17%	-0.50%	-6.52%
last 15yrs (2005-2019)	6.16%	5.33%	5.15%	5.45%	2.54%	4.61%	4.85%	1.32%	-0.66%	-0.05%	6.56%	1.55%	-0.34%	-0.14%	-5.20%
last 25yrs (1995-2019)	7.43%	6.38%	6.24%	6.56%	3.75%	5.60%	5.17%	2.76%	0.15%	1.74%	3.43%	0.27%	2.41%	-1.64%	-1.20%
last 50yrs (1970-2019)	6.18%	4.99%	4.66%	5.37%	3.45%	3.86%			0.78%	1.08%	3.77%	-0.75%	1.87%	-1.59%	-1.45%
last 75yrs (1945-2019)	7.25%	2.57%	2.27%	2.98%	1.80%	1.74%			0.37%	1.08%	1.44%	0.55%	0.57%	-2.20%	-1.50%
last 100yrs (1920-2019)	7.26%	3.54%	3.31%	4.01%	2.52%	2.60%			0.79%	1.05%	1.70%	0.03%	-0.21%	-1.97%	-1.27%
last 150yrs (1870-2019)	6.52%				2.44%				1.04%		0.52%	-0.82%	-0.64%	-1.04%	
last 200yrs (1820-2019)	6.70%				3.05%				1.78%		0.36%	-0.70%			
since 1800	6.79%				3.43%				2.06%		0.31%	-0.94%			
since 1900	6.39%	2.72%			1.62%	1.75%			0.34%	0.51%	0.62%	-0.79%	-0.04%	-1.36%	
since 1920	7.26%	3.54%	3.31%	4.01%	2.52%	2.60%			0.79%	1.05%	1.70%	0.03%	-0.21%	-1.97%	-1.27%
since 1930	6.34%	3.08%	2.86%	3.54%	2.07%	2.11%			0.34%	0.99%	1.79%	-0.02%	0.23%	-1.59%	-1.02%
1900-2019	6.39%	2.72%			1.62%	1.75%			0.34%	0.51%	0.62%	-0.79%	-0.04%	-1.36%	
since 1971	6.34%	5.10%	4.69%	5.53%	3.27%	3.78%			0.78%	1.05%	3.83%	-0.54%	1.89%	-1.81%	-1.35%
since 1980	8.19%	6.79%	6.44%	7.14%	4.66%	5.77%			1.19%	1.21%	-0.29%	-0.68%	-2.06%	-2.88%	-2.51%
since 1985	8.27%	7.17%	6.89%	7.44%	4.66%	6.25%	6.07%	3.78%	0.73%	1.55%	2.04%	1.54%	-0.44%	-1.86%	-1.58%
since 1999	3.97%	5.58%	5.28%	5.82%	2.56%	4.22%	4.41%	1.70%	-0.36%	1.82%	5.98%	4.06%	5.22%	0.77%	-0.66%
RETURNS BY DECADE															
1800-1809	11.09%				8.74%				5.16%		0.00%	-1.62%			
1810-1819	4.56%				5.87%				4.72%		-0.34%	-4.96%			
1820-1829	9.05%				7.76%				5.86%		1.98%	0.31%			
1830-1839	3.23%				0.10%				2.20%		-1.35%	-0.65%			
1840-1849	10.82%				10.75%				7.94%		2.75%	0.13%			
1850-1859	0.07%				3.64%				3.47%		-1.53%	0.79%		4.08%	
1860-1869	13.58%				2.66%				0.81%		-2.29%	-2.20%	-16.24%	-5.75%	
1870-1879	10.20%				8.57%				6.50%		0.47%	0.19%	-12.30%	7.64%	
1880-1889	5.68%				5.50%				3.04%		0.00%	-1.66%	-0.70%	-5.09%	
1890-1899	5.23%				3.30%				2.19%		-0.13%	-1.39%	4.74%	-1.34%	
1900-1909	7.36%	1.95%			-0.73%	-0.22%			0.63%	-0.41%	-2.34%	-5.80%	-3.73%	3.58%	
1910-1919	-2.78%	-4.39%			-4.72%	-4.49%			-4.29%	-3.90%	-6.84%	-3.72%	5.59%	-0.14%	
1920-1929	15.87%	7.74%	7.53%	8.32%	6.65%	7.06%			4.87%	1.61%	0.95%	0.46%	-4.08%	-5.29%	-3.42%
1930-1939	1.60%	8.68%	9.72%	8.64%	6.27%	7.69%			2.67%	0.85%	7.60%	-1.50%	0.24%	-0.19%	1.37%
1940-1949	3.45%	-1.36%	-2.31%	0.07%	-2.63%	-2.79%			-4.63%	2.62%	-3.69%	-1.29%	-4.83%	2.17%	0.52%
1950-1959	16.67%	-2.02%	-2.25%	-1.60%	-1.80%	-2.67%			-0.20%	0.74%	-3.52%	3.66%	-0.75%	-2.84%	-1.57%
1960-1969	5.11%	-1.89%	-2.05%	-1.59%	-0.15%	-1.96%			1.51%	-0.65%	-2.47%	2.84%	-1.69%	-5.34%	-2.22%
1970-1979	-1.51%	-1.91%	-2.20%	-1.43%	-1.21%	-3.43%			-0.85%	0.56%	21.71%	-1.03%	19.23%	3.76%	2.88%
1980-1989	11.78%	8.22%	7.56%	8.90%	7.32%	7.19%			3.84%	1.76%	-7.10%	-4.30%	-9.98%	-5.54%	-6.75%
1990-1999	14.83%	6.18%	5.73%	6.82%	4.90%	5.30%	8.03%	4.27%	1.95%	-0.26%	-6.08%	-4.92%	-1.23%	-8.99%	0.24%
2000-2009	-3.42%	6.16%	6.19%	5.91%	3.75%	4.36%	3.86%	3.53%	0.18%	1.35%	11.46%	11.12%	9.12%	4.01%	3.39%
2010-2019	10.53%	6.61%	6.31%	6.96%	2.72%	6.24%	5.43%	0.82%	-1.13%	1.99%	1.63%	-3.75%	-5.17%	-0.50%	-6.52%
RETURNS BY HALF CENTURY															
1800-1849	7.70%				6.58%				5.16%		0.60%	-1.37%			
1850-1899	6.85%				4.72%				3.19%		-0.70%	-0.86%		-0.23%	
1900-1949	4.91%	2.40%			0.86%	1.33%			-0.22%	0.13%	-0.98%	-2.40%	-1.44%	-0.02%	
1950-1999	9.17%	1.62%	1.27%	2.12%	1.75%	0.79%			1.24%	0.43%	-0.01%	-0.81%	0.68%	-3.88%	-1.53%
2000-2019	3.32%	6.38%	6.25%	6.44%	3.23%	5.29%	4.64%	2.17%	-0.48%	1.67%	6.43%	3.42%	1.72%	1.73%	-1.69%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 100: Developed market nominal equity and bond returns (annualised)

										Returns by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																														
Australia	8.4%	7.6%	9.6%	10.7%	11.8%	11.8%	12.1%	11.3%	8.7%										7.9%	13.6%	9.7%	15.4%	10.2%	10.1%	15.3%	14.0%	8.6%	17.7%	11.0%	8.9%	7.6%
Austria	9.6%	4.5%	5.6%	7.1%				7.0%	6.1%																		6.5%	16.3%	1.4%	7.4%	4.5%
Belgium	3.3%	6.7%	7.4%	9.4%	7.7%	7.5%	6.2%	9.4%	3.6%											6.4%	6.7%	9.2%	-6.9%	11.9%	14.0%	3.4%	7.2%	20.6%	11.4%	1.8%	6.7%
Canada	5.3%	6.4%	8.1%	9.0%	9.2%	9.0%	8.8%	9.3%	7.1%				49.0%	9.8%	4.7%	1.1%	6.0%	6.0%	6.1%	10.0%	6.0%	14.7%	1.0%	8.4%	13.3%	10.0%	10.4%	12.2%	10.6%	5.6%	6.4%
Denmark	10.0%	13.5%	12.3%	12.4%	9.1%	7.9%	4.7%	12.8%	10.4%									4.8%	2.8%	2.0%	2.8%	-0.8%	4.7%	7.1%	11.2%	7.4%	7.9%	23.8%	11.1%	6.7%	13.5%
France	8.3%	7.8%	8.2%	9.8%	11.2%	10.4%	10.6%	10.2%	5.7%		10.0%	7.4%	9.4%	7.2%	16.7%	5.8%	7.8%	6.4%	6.1%	5.6%	8.1%	16.9%	-1.5%	20.7%	24.0%	4.5%	6.8%	21.9%	14.3%	-0.3%	7.8%
Germany	4.9%	8.0%	7.0%	7.3%	8.2%	5.4%	3.7%	8.0%	4.7%					3.6%	4.2%	11.2%	7.7%	10.0%	5.1%	5.6%	-18.7%	18.1%	4.5%	-6.0%	25.8%	6.0%	2.2%	15.9%	12.1%	-0.9%	8.0%
Hong Kong	5.3%	5.2%	8.3%	15.0%				14.5%	8.2%																		24.1%	17.1%	24.3%	6.0%	5.2%
Ireland	4.4%	9.2%	7.1%						3.0%																				14.4%	-2.8%	9.2%
Italy	7.3%	4.4%	6.0%	7.5%				8.1%	2.4%														6.5%	30.4%	23.5%	3.7%	-3.0%	28.0%	12.6%	-1.5%	4.4%
Japan	3.4%	7.4%	1.4%	5.9%	10.2%	9.8%	12.3%	6.3%	3.2%										2.5%	2.5%	14.2%	-1.2%	14.2%	15.9%	33.9%	13.0%	12.3%	21.3%	-4.2%	-5.1%	7.4%
Netherlands	8.3%	8.2%	7.8%	10.1%				10.4%	3.9%																	6.1%	5.7%	20.3%	20.6%	-2.6%	8.2%
New Zealand	14.2%	13.6%	10.0%						10.2%																				8.3%	6.2%	13.6%
Norway	8.5%	8.8%	9.5%	10.8%				10.4%	9.6%																		14.1%	14.0%	9.9%	7.3%	8.8%
Portugal	8.0%	0.8%	5.0%						1.2%																				11.1%	0.6%	0.8%
Spain	-3.9%	-0.6%	7.9%	9.1%				9.4%	2.8%																13.3%	19.1%	-1.2%	27.4%	18.7%	4.3%	-0.6%
Sweden	7.3%	10.1%	10.8%	13.4%	10.4%	9.3%	6.0%	14.2%	8.1%									7.9%	9.1%	5.7%	1.9%	3.5%	-0.2%	10.5%	16.3%	8.1%	6.7%	32.4%	19.0%	1.3%	10.1%
Switzerland	6.4%	7.9%	8.1%	7.4%				7.9%	4.8%																		2.0%	10.6%	16.0%	1.1%	7.9%
UK	6.0%	7.4%	7.5%	11.3%	10.2%	8.6%	6.6%	11.7%	5.3%	8.1%	5.4%	4.8%	4.3%	4.8%	3.8%	4.4%	4.9%	5.5%	3.0%	0.6%	1.5%	9.5%	1.9%	8.9%	17.2%	8.3%	10.2%	23.9%	14.9%	1.6%	7.4%
US	9.4%	12.4%	9.8%	10.3%	10.1%	9.6%	9.0%	10.5%	6.2%	11.1%	4.9%	6.9%	5.3%	7.8%	1.6%	18.3%	7.7%	5.7%	5.4%	9.9%	4.3%	14.8%	-0.5%	9.0%	19.3%	7.8%	5.8%	17.5%	18.2%	-0.9%	12.4%
BOND																														
Australia	5.8%	7.5%	8.1%	9.3%	7.1%	6.2%	4.0%	9.5%	6.3%							5.2%	5.1%	5.2%	4.0%	2.1%	1.8%	5.3%	7.2%	5.1%	3.1%	4.2%	6.9%	12.4%	12.9%	6.7%	7.5%
Austria	1.5%	4.8%	5.9%	7.2%				7.2%	4.7%														-0.7%	8.2%	7.9%	6.2%	8.1%	8.7%	8.5%	5.8%	4.8%
Belgium	2.5%	5.3%	6.6%	8.0%	6.6%	5.6%	4.0%	8.0%	5.1%					3.8%	6.1%	5.0%	5.2%	4.9%	3.4%	2.9%	-1.2%	8.4%	3.9%	4.9%	4.3%	4.4%	6.3%	12.0%	10.4%	6.0%	5.3%
Canada	2.7%	4.2%	6.6%	8.3%	6.1%	5.4%	3.6%	8.1%	5.0%							5.0%	6.3%	6.5%	3.3%	2.5%	1.6%	5.8%	5.2%	3.5%	1.5%	3.7%	6.8%	13.4%	10.7%	6.8%	4.2%
Denmark	3.0%	5.0%	6.7%	10.2%	8.0%	7.1%	4.9%	10.3%	5.0%	4.1%	-1.4%	8.9%	4.1%	3.6%	5.1%	4.7%	5.9%	5.0%	3.3%	3.7%	1.1%	6.6%	6.0%	8.3%	4.5%	4.1%	10.1%	18.9%	11.2%	6.1%	5.0%
France	2.6%	5.0%	6.4%	8.3%	6.6%	5.6%	3.7%	8.5%	4.8%	21.8%	6.0%	11.9%	3.9%	0.4%	6.8%	5.1%	6.0%	4.5%	4.3%	3.1%	-1.0%	8.1%	3.8%	2.8%	5.4%	4.3%	6.1%	14.7%	10.1%	5.9%	5.0%
Germany	2.3%	4.7%	6.0%	7.0%				7.1%	4.7%														7.3%	-17.3%	5.9%	5.8%	8.1%	8.2%	8.5%	5.8%	4.7%
Hong Kong	2.9%	3.0%	5.0%		1.9%	1.9%			4.2%											0.6%	3.6%	-1.8%								6.0%	3.0%
Ireland	3.2%	7.6%	7.3%	9.3%	7.2%	6.0%	3.3%	10.1%	5.6%								3.8%	2.7%	2.9%	1.4%	-0.5%	6.6%	3.8%	7.2%	4.6%	3.4%	5.5%	18.4%	10.6%	5.1%	7.6%
Italy	4.3%	6.3%	8.1%	9.9%	7.1%	6.5%	4.0%	10.2%	5.4%		12.4%	10.5%	7.4%	18.6%	6.3%	1.0%	12.3%	6.4%	5.9%	5.1%	1.5%	2.9%	5.9%	5.0%	3.3%	5.0%	6.5%	17.3%	14.3%	5.8%	6.3%
Japan	1.1%	1.9%	2.9%	5.3%	6.3%	5.9%	6.2%	5.3%	2.0%									6.8%	5.2%	6.3%	1.1%	8.1%	5.1%	3.8%	8.2%	11.3%	6.8%	9.2%	7.2%	1.8%	1.9%
Netherlands	2.4%	4.9%	6.1%	7.3%	4.3%	3.8%	1.5%	7.3%	4.8%	-1.4%	-3.3%	9.0%	3.2%	5.6%	5.8%	2.5%	6.1%	6.3%	2.6%	2.8%	0.4%	5.9%	4.3%	4.6%	0.2%	-7.7%	7.5%	9.6%	8.7%	5.9%	4.9%
New Zealand	7.2%	7.9%	7.8%	8.8%	6.6%	5.7%	3.5%	8.9%	6.8%								5.9%	6.0%	4.1%	2.4%	0.4%	6.8%	5.4%	5.2%	-0.4%	4.7%	2.6%	15.1%	11.9%	7.2%	7.9%
Norway	2.3%	4.7%	5.9%	7.7%	6.3%	5.6%	4.2%	7.7%	4.9%				4.9%	4.1%	3.4%	3.7%	6.8%	4.9%	1.7%	3.8%	0.2%	6.9%	4.2%	13.4%	-3.6%	4.8%	4.4%	13.1%	11.0%	5.5%	4.7%
Portugal	6.9%	9.2%	9.2%	10.6%	8.1%	7.6%	5.4%	10.7%	6.8%				10.8%	8.8%	12.2%	3.9%	12.6%	7.9%	-5.5%	7.8%	1.6%	9.3%	10.1%	2.7%	3.9%	3.0%	1.6%	19.5%	17.8%	5.9%	9.2%
Spain	4.7%	7.0%	7.3%	9.5%	6.9%	6.8%	4.8%	9.7%	5.9%	3.4%	-18.4%	15.7%	11.6%	-2.7%	12.2%	3.7%	0.0%	14.4%	5.4%	8.8%	3.3%	5.4%	6.2%	3.3%	2.8%	4.8%	6.5%	16.4%	12.1%	5.6%	7.0%
Sweden	2.2%	3.7%	6.0%	7.8%	5.9%	5.4%	3.9%	7.8%	4.3%							5.2%	5.8%	5.0%	3.1%	3.1%	3.4%	5.9%	4.1%	3.9%	2.5%	3.8%	6.1%	11.7%	11.9%	5.6%	3.7%
Switzerland	3.3%	3.5%	4.2%	4.7%	4.3%	4.0%	3.6%	4.7%	3.6%											3.6%	1.5%	6.0%	4.2%	4.1%	2.7%	2.9%	5.8%	3.9%	5.9%	4.3%	3.5%
UK	2.7%	4.7%	6.6%	9.0%	6.1%	5.1%	2.3%	9.2%	4.9%	6.1%	4.1%	7.2%	3.3%	3.8%	3.3%	2.8%	3.8%	2.7%	2.9%	1.3%	-1.0%	5.2%	7.1%	2.0%	0.9%	1.6%	8.2%	14.1%	12.1%	6.0%	4.7%
US	3.4%	4.4%	6.0%	7.5%	5.2%	4.7%	2.9%	7.3%	4.8%	8.7%	6.2%	5.7%	2.1%	7.8%	5.3%	7.0%	6.1%	5.5%	3.4%	1.6%	2.3%	5.6%	4.1%	2.6%	0.4%	2.4%	6.1%	12.8%	8.0%	6.4%	4.4%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 101: Developed market real equity and bond returns (annualised)

										Returns by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																														
Australia	6.8%	5.5%	7.0%	5.3%	7.6%	7.7%	9.0%	5.9%	6.0%										9.5%	12.3%	4.2%	14.6%	11.3%	4.5%	8.4%	11.2%	-1.4%	8.6%	8.6%	5.6%	5.5%
Austria	8.2%	2.7%	3.8%	3.9%				3.8%	4.2%																		0.5%	12.2%	-1.0%	5.5%	2.7%
Belgium	1.7%	4.9%	5.5%	5.6%		2.5%	0.3%	5.7%	1.7%											3.3%			-6.3%	-0.7%	11.6%	0.6%	0.1%	15.2%	9.1%	-0.3%	4.9%
Canada	3.3%	4.5%	6.1%	4.9%	6.4%	5.8%	6.2%	5.1%	5.1%				48.5%	14.0%	0.5%	5.8%	7.9%	5.7%	7.4%	5.7%	-0.3%	15.6%	2.9%	3.7%	10.6%	7.1%	2.7%	5.6%	8.3%	3.5%	4.5%
Denmark	9.2%	12.2%	10.4%	7.9%	5.4%	4.0%	1.1%	8.4%	8.7%									5.4%	2.9%	1.0%	-5.7%	0.2%	2.8%	2.6%	7.1%	1.7%	-1.6%	16.3%	8.8%	4.7%	12.2%
France	7.2%	6.5%	6.6%	5.5%	3.8%	3.3%	1.7%	5.8%	4.1%						16.1%	5.1%	7.3%	6.5%	6.4%	5.3%	-3.3%	8.3%	-4.3%	-8.8%	17.4%	0.6%	-2.2%	14.1%	12.2%	-2.1%	6.5%
Germany	3.4%	6.5%	5.4%	4.5%	-16.6%	-16.5%	-28.9%	5.2%	3.1%					4.8%	0.4%	9.5%	6.1%	9.6%	5.2%	3.6%	-32.6%	-89.3%	6.5%	-9.5%	23.1%	3.5%	-2.6%	12.8%	9.6%	-2.5%	6.5%
Hong Kong	3.3%	2.0%	6.4%	9.3%				8.8%	6.7%																		14.6%	7.7%	17.1%	5.7%	2.0%
Ireland	3.9%	8.6%	5.4%						1.3%																				11.8%	-5.2%	8.6%
Italy	7.0%	3.3%	4.0%	1.4%				2.0%	0.7%														6.1%	-12.8%	18.9%	0.0%	-14.1%	15.9%	8.3%	-3.7%	3.3%
Japan	3.1%	6.9%	1.2%	3.4%	3.4%	3.1%	2.6%	3.9%	3.1%										-3.9%	-1.0%	4.6%	2.6%	10.4%	-24.8%	29.5%	7.1%	3.2%	18.6%	-5.3%	-4.8%	6.9%
Netherlands	6.7%	6.5%	5.8%	6.7%				7.0%	1.9%																	2.0%	-1.4%	17.1%	17.8%	-4.7%	6.5%
New Zealand	12.9%	11.9%	7.9%						8.0%																				6.3%	3.4%	11.9%
Norway	5.8%	6.6%	7.3%	5.9%				5.7%	7.4%																		5.2%	5.4%	7.3%	5.2%	6.6%
Portugal	7.2%	-0.4%	2.9%						-0.6%																				5.1%	-1.9%	-0.4%
Spain	-4.6%	-1.7%	5.6%	2.6%				2.8%	0.7%																7.1%	12.6%	-13.9%	16.0%	14.1%	1.3%	-1.7%
Sweden	5.7%	8.9%	9.3%	8.6%	7.2%	5.6%	3.1%	9.4%	6.4%									8.5%	8.3%	4.7%	-8.2%	8.4%	-0.9%	6.5%	11.3%	4.1%	-2.0%	23.0%	15.6%	-0.6%	8.9%
Switzerland	6.2%	7.9%	7.5%	5.0%				5.6%	4.3%																		-2.8%	7.0%	13.6%	0.2%	7.9%
UK	4.5%	5.2%	5.2%	5.6%	6.5%	4.8%	4.1%	6.0%	3.3%	4.6%	6.3%	7.2%	3.7%	6.9%	3.7%	3.9%	5.4%	5.9%	3.0%	-0.2%	-5.8%	12.9%	1.4%	5.9%	12.5%	4.5%	-2.6%	15.9%	11.0%	-0.3%	5.2%
US	7.6%	10.5%	7.4%	6.2%	7.3%	6.4%	6.4%	6.3%	4.0%	11.1%	4.6%	9.1%	3.2%	10.8%	0.1%	13.6%	10.2%	5.7%	5.2%	7.4%	-2.8%	15.9%	1.6%	3.4%	16.7%	5.1%	-1.5%	11.8%	14.8%	-3.4%	10.5%
BOND																														
Australia	4.2%	5.4%	5.5%	3.9%	3.0%	2.3%	1.1%	4.1%	3.7%								5.0%	4.9%	5.6%	1.0%	-3.3%	4.6%	8.3%	-0.2%	-3.1%	1.7%	-2.9%	3.8%	10.4%	3.5%	5.4%
Austria	0.2%	3.0%	4.1%	3.9%				4.0%	2.9%																3.0%	2.7%	2.0%	4.8%	5.9%	3.9%	3.0%
Belgium	1.0%	3.6%	4.7%	4.3%		0.7%	-1.8%	4.3%	3.1%					4.9%	5.9%	3.5%	1.4%	4.0%	0.1%	-0.1%			4.6%	-6.9%	2.2%	1.6%	-0.8%	6.9%	8.2%	3.9%	3.6%
Canada	0.7%	2.3%	4.6%	4.2%	3.4%	2.3%	1.1%	4.0%	3.0%							9.8%	8.1%	6.2%	4.6%	-1.5%	-4.5%	6.7%	7.1%	-1.0%	-0.9%	1.0%	-0.7%	6.8%	8.4%	4.6%	2.3%
Denmark	2.2%	3.9%	5.0%	5.8%	4.3%	3.1%	1.3%	5.9%	3.3%	-1.7%	-20.4%	18.3%	4.4%	3.9%	3.7%	4.2%	6.1%	5.6%	3.4%	2.6%	-7.3%	7.6%	4.0%	3.7%	0.6%	-1.4%	0.5%	11.7%	9.0%	4.1%	3.9%
France	1.5%	3.8%	4.8%	4.0%	-0.5%	-1.2%	-4.7%	4.2%	3.3%						6.3%	4.3%	5.6%	4.7%	4.6%	2.7%	-11.5%	0.1%	0.8%	-22.4%	-0.2%	0.4%	-2.8%	7.3%	8.2%	4.0%	3.8%
Germany	0.9%	3.2%	4.4%	4.3%				4.4%	3.1%														9.3%	-20.4%	3.6%	3.4%	3.0%	5.3%	6.1%	4.1%	3.2%
Hong Kong	0.9%	-0.1%	3.1%						2.8%																					5.8%	-0.1%
Ireland	2.7%	7.0%	5.5%	3.7%				4.6%	3.9%														3.1%	1.9%	0.9%	-0.9%	-6.7%	8.8%	8.0%	2.5%	7.0%
Italy	3.9%	5.2%	6.1%	3.7%	-1.7%	-1.8%	-5.5%	4.0%	3.6%								10.7%	7.1%	6.1%	4.3%	-8.7%	-5.2%	5.5%	-29.8%	-0.6%	1.3%	-5.6%	6.3%	9.9%	3.4%	5.2%
Japan	0.7%	1.4%	2.8%	2.8%	-0.3%	-0.6%	-3.0%	2.9%	1.9%									10.3%	-1.4%	2.7%	-7.3%	12.3%	1.6%	-32.6%	4.7%	5.4%	-1.8%	6.7%	6.1%	2.1%	1.4%
Netherlands	0.9%	3.2%	4.1%	4.0%	1.5%	0.7%	-1.4%	4.0%	2.8%	-2.3%	-2.0%	10.8%	3.0%	7.0%	5.5%	2.6%	5.8%	8.3%	3.4%	0.8%	-6.2%	8.1%	5.8%	-3.0%	-3.4%	-11.2%	0.3%	6.7%	6.2%	3.6%	3.2%
New Zealand	6.0%	6.3%	5.8%	2.9%	2.5%			3.0%	4.7%													7.3%	5.3%	2.3%	-4.9%	1.4%	-8.3%	3.3%	9.9%	4.3%	6.3%
Norway	-0.3%	2.7%	3.8%	3.0%	3.1%	1.9%	1.0%	3.2%	2.8%				4.1%	3.1%	2.1%	4.6%	6.9%	5.2%	0.9%	2.9%	-10.2%	11.7%	3.1%	9.0%	-8.2%	1.2%	-3.7%	4.6%	8.3%	3.5%	2.7%
Portugal	6.1%	7.9%	7.0%	1.8%				1.9%	4.9%															-4.6%	3.0%	-1.3%	-13.9%	2.4%	11.4%	3.3%	7.9%
Spain	4.0%	5.8%	5.0%	2.9%	1.1%	1.4%	0.3%	3.1%	3.7%		-20.3%	20.9%	7.4%	0.0%	10.8%	3.5%	-0.7%	14.3%	6.3%	7.6%	-0.7%	4.8%	1.3%	-5.7%	-2.9%	-0.9%	-7.1%	6.1%	7.8%	2.6%	5.8%
Sweden	0.7%	2.5%	4.5%	3.1%	2.8%	1.9%	1.0%	3.2%	2.7%							4.3%	5.8%	5.5%	2.3%	2.1%	-6.8%	11.0%	3.4%	0.2%	-1.9%	0.0%	-2.5%	3.8%	8.6%	3.7%	2.5%
Switzerland	3.1%	3.5%	3.7%	2.4%	2.7%	1.9%	1.5%	2.5%	3.1%											2.4%	-6.9%	9.5%	5.5%	-0.4%	1.5%	-0.3%	0.8%	0.6%	3.7%	3.3%	3.5%
UK	1.2%	2.6%	4.4%	3.4%	2.5%	1.4%	-0.1%	3.6%	2.8%	2.7%	5.0%	9.7%	2.7%	5.9%	3.3%	2.3%	4.3%	3.1%	2.9%	0.5%	-8.1%	8.4%	6.6%	-0.8%	-3.1%	-2.0%	-4.3%	6.7%	8.4%	4.0%	2.6%
US	1.7%	2.7%	3.8%	3.5%	2.5%	1.6%	0.5%	3.3%	2.6%	8.7%	5.9%	7.8%	0.1%	10.8%	3.6%	2.7%	8.6%	5.5%	3.3%	-0.7%	-4.7%	6.6%	6.3%	-2.6%	-1.8%	-0.2%	-1.2%	7.3%	4.9%	3.7%	2.7%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 102: Developed market USD equity and bond returns (annualised)

	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	Returns by Decade: 1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																															
Australia	4.3%	4.6%	9.0%	9.6%	10.7%	10.6%	10.9%	10.2%	9.2%										8.0%	13.6%	6.9%	18.5%	5.5%	6.4%	15.3%	14.0%	8.5%	13.8%	9.0%	12.4%	4.6%
Austria	7.5%	1.7%	5.0%	8.7%				8.6%	5.8%																		14.6%	16.8%	0.0%	11.3%	1.7%
Belgium	1.3%	3.9%	6.8%	10.0%	6.4%	5.8%	2.9%	10.1%	3.3%											6.4%	-1.0%	-3.0%	-5.3%	6.3%	14.0%	3.4%	13.5%	17.8%	10.1%	5.4%	3.9%
Canada	2.4%	3.9%	8.3%	8.5%	9.0%	8.7%	8.7%	8.7%	7.8%				48.8%	9.6%	5.4%	4.1%	3.0%	6.1%	6.0%	9.8%	5.2%	15.4%	0.0%	8.5%	15.1%	8.7%	9.5%	12.3%	8.1%	9.0%	3.9%
Denmark	7.8%	10.5%	11.8%	12.6%	8.8%	7.4%	3.7%	13.1%	10.1%									4.8%	2.8%	2.1%	-0.5%	2.6%	1.3%	4.0%	11.2%	6.5%	11.5%	21.3%	9.8%	10.5%	10.5%
France	6.3%	4.9%	7.7%	9.7%	6.8%	6.2%	3.6%	10.0%	5.4%		7.6%	7.7%	9.5%	7.1%	16.9%	7.7%	5.7%	6.4%	6.2%	5.7%	0.3%	7.5%	-6.9%	-1.7%	19.9%	3.2%	10.3%	17.6%	12.9%	3.3%	4.9%
Germany	2.9%	5.2%	6.4%	8.9%	-17.1%	-17.3%	-31.8%	9.6%	4.3%					3.6%	4.3%	13.2%	5.8%	10.0%	5.1%	5.6%	-36.5%	-90.5%	10.0%	-29.1%	25.9%	7.3%	10.3%	16.1%	10.5%	2.7%	5.2%
Hong Kong	5.1%	5.1%	8.2%	14.4%				13.9%	8.1%																		26.8%	11.8%	24.3%	6.0%	5.1%
Ireland	2.4%	6.3%	6.7%						2.7%																				12.2%	0.7%	6.3%
Italy	5.3%	1.7%	5.6%	5.3%				5.9%	2.1%														6.1%	-7.6%	23.6%	3.6%	-5.4%	22.3%	8.0%	2.1%	1.7%
Japan	5.9%	6.0%	1.1%	8.5%	5.9%	6.3%	4.4%	9.0%	3.5%										-2.1%	2.5%	14.3%	-1.4%	6.1%	-25.6%	33.9%	13.0%	16.9%	27.7%	-0.9%	-4.2%	6.0%
Netherlands	6.2%	5.4%	7.2%	11.4%				11.7%	3.5%																	6.5%	12.7%	20.2%	19.0%	0.9%	5.4%
New Zealand	9.4%	12.0%	9.9%						11.1%																				6.9%	9.7%	12.0%
Norway	4.3%	3.9%	8.2%	10.2%				9.8%	8.6%																		18.4%	10.7%	7.8%	10.9%	3.9%
Portugal	6.0%	-1.9%	4.4%						0.9%																				7.9%	4.2%	-1.9%
Spain	-5.7%	-3.2%	7.3%	7.4%				7.7%	2.4%																3.8%	17.3%	-0.7%	21.2%	13.9%	8.0%	-3.2%
Sweden	2.5%	6.7%	9.6%	12.0%	9.6%	8.4%	5.5%	12.7%	7.1%									7.9%	9.2%	5.7%	-0.5%	6.0%	-1.5%	8.2%	16.3%	8.1%	9.1%	27.2%	15.4%	3.0%	6.7%
Switzerland	6.5%	8.4%	9.3%	10.6%				11.2%	6.5%																		12.7%	11.0%	15.6%	5.6%	8.4%
UK	0.9%	4.4%	6.4%	9.8%	9.0%	7.4%	5.5%	10.1%	3.8%	8.1%	5.6%	5.5%	4.3%	4.8%	3.9%	6.4%	2.9%	5.5%	3.1%	0.6%	-1.1%	12.4%	-0.2%	5.2%	17.2%	6.7%	9.3%	20.0%	14.9%	1.6%	4.4%
US	9.4%	12.4%	9.8%	10.3%	10.1%	9.6%	9.0%	10.5%	6.2%	11.1%	4.9%	6.9%	5.3%	7.8%	1.6%	18.3%	7.7%	5.7%	5.4%	9.9%	4.3%	14.8%	-0.5%	9.0%	19.3%	7.8%	5.8%	17.5%	18.2%	-0.9%	12.4%
BOND																															
Australia	1.8%	4.4%	7.5%	8.2%	6.0%	5.1%	2.9%	8.3%	6.8%							7.2%	3.2%	5.1%	4.1%	2.1%	-0.8%	8.1%	2.6%	1.5%	3.1%	4.2%	6.8%	8.7%	10.9%	10.1%	4.4%
Austria	-0.5%	2.1%	5.3%	8.7%				8.8%	4.4%														2.3%	-17.4%	7.9%	6.3%	16.3%	9.2%	7.0%	9.6%	2.1%
Belgium	0.6%	2.6%	6.0%	8.6%	5.3%	3.9%	0.7%	8.7%	4.7%					3.6%	6.3%	6.9%	3.2%	4.9%	3.4%	2.9%	-8.3%	-3.7%	5.8%	-0.3%	4.3%	4.5%	12.6%	9.4%	9.2%	9.8%	2.6%
Canada	-0.1%	1.7%	6.8%	7.9%	5.9%	5.2%	3.5%	7.5%	5.7%							8.0%	3.3%	6.6%	3.2%	2.3%	0.9%	6.5%	4.1%	3.6%	3.2%	2.4%	5.9%	13.5%	8.2%	10.2%	1.7%
Denmark	1.0%	2.3%	6.3%	10.4%	7.7%	6.5%	3.8%	10.5%	4.7%			10.5%	6.8%	4.2%	5.7%	6.5%	3.9%	5.0%	3.2%	3.7%	-2.1%	10.2%	2.5%	5.2%	4.5%	3.2%	13.9%	16.5%	10.0%	9.9%	2.3%
France	0.6%	2.3%	5.9%	8.2%	2.4%	1.5%	-2.9%	8.3%	4.5%		3.7%	12.2%	4.0%	0.3%	7.1%	7.0%	4.0%	4.5%	4.4%	3.1%	-8.2%	-0.6%	-1.9%	-16.3%	1.9%	3.0%	9.6%	10.7%	8.8%	9.7%	2.3%
Germany	0.3%	1.9%	5.4%	8.6%				8.7%	4.3%														13.0%	-37.6%	5.9%	7.1%	16.7%	8.4%	7.0%	9.6%	1.9%
Hong Kong	2.7%	2.9%	5.0%						4.1%											-0.6%	11.9%	-9.5%								6.1%	2.9%
Ireland	1.2%	4.7%	6.9%	8.1%	6.1%	4.9%	2.3%	8.9%	5.3%								1.9%	2.7%	3.0%	1.3%	-3.1%	9.4%	1.7%	3.5%	4.6%	1.8%	4.3%	14.6%	8.4%	8.8%	4.7%
Italy	2.3%	3.5%	7.8%	7.7%	2.0%	1.5%	-2.7%	7.9%	5.0%			11.8%	7.5%	18.1%	6.9%	2.3%	9.5%	7.6%	5.4%	5.8%	-7.5%	-0.8%	5.5%	-25.7%	3.4%	4.9%	3.9%	12.1%	9.6%	9.6%	3.5%
Japan	3.5%	0.5%	2.7%	7.9%	2.2%	2.4%	-1.2%	8.0%	2.3%									5.2%	0.4%	6.3%	1.2%	7.9%	-2.4%	-33.4%	8.2%	11.3%	11.2%	14.9%	11.0%	2.8%	0.5%
Netherlands	0.5%	2.2%	5.5%	8.6%	4.6%	4.0%	1.0%	8.6%	4.5%	0.1%	-3.9%	9.3%	3.2%	5.5%	6.2%	4.2%	3.9%	6.3%	2.6%	2.7%	-0.3%	6.8%	7.3%	-2.5%	0.3%	-7.3%	14.7%	9.6%	7.3%	9.6%	2.2%
New Zealand	2.8%	6.4%	7.8%	7.6%	5.4%	4.5%	2.4%	7.6%	7.7%								3.9%	6.0%	4.2%	2.4%	-2.2%	9.6%	5.5%	-0.6%	-0.5%	2.5%	1.3%	9.4%	10.5%	10.7%	6.4%
Norway	-1.7%	0.1%	4.6%	7.2%	5.7%	4.8%	3.2%	7.2%	4.0%				7.5%	4.7%	3.9%	5.4%	4.7%	4.9%	1.8%	3.7%	-2.6%	9.9%	2.5%	8.0%	-3.6%	4.8%	8.4%	9.8%	8.8%	9.0%	0.1%
Portugal	4.8%	6.3%	8.6%	6.5%	3.8%	3.2%	1.0%	6.6%	6.4%				13.3%	8.5%	12.2%	5.7%	10.6%	7.9%	-8.9%	10.5%	-8.8%	-10.0%	7.7%	2.3%	3.8%	3.1%	-3.9%	7.2%	14.4%	9.7%	6.3%
Spain	2.7%	4.2%	6.7%	7.8%	3.4%	4.1%	1.4%	8.0%	5.5%			16.7%	11.7%	-2.6%	12.3%	5.2%	-2.3%	13.9%	3.5%	10.9%	3.9%	1.6%	3.2%	-5.7%	-5.9%	3.2%	7.1%	10.7%	7.6%	9.4%	4.2%
Sweden	-2.4%	0.5%	4.8%	6.4%	5.1%	4.6%	3.4%	6.4%	3.4%							6.8%	3.8%	5.0%	3.2%	3.1%	1.0%	8.5%	2.8%	1.8%	2.5%	3.9%	8.5%	7.3%	8.4%	7.5%	0.5%
Switzerland	3.3%	4.0%	5.4%	7.8%	6.2%	5.5%	3.9%	7.9%	5.2%											3.7%	0.7%	6.9%	5.7%	4.5%	2.7%	2.9%	16.9%	4.3%	5.6%	8.9%	4.0%
UK	-2.3%	1.7%	5.6%	7.5%	4.9%	3.9%	1.3%	7.7%	3.3%	6.1%	4.4%	8.0%	3.3%	3.7%	3.4%	4.8%	1.9%	2.7%	3.0%	1.2%	-3.5%	8.0%	4.9%	-1.5%	0.9%	0.0%	7.3%	10.6%	12.2%	6.0%	1.7%
US	3.4%	4.4%	6.0%	7.5%	5.2%	4.7%	2.9%	7.3%	4.8%	8.7%	6.2%	5.7%	2.1%	7.8%	5.3%	7.0%	6.1%	5.5%	3.4%	1.6%	2.3%	5.6%	4.1%	2.6%	0.4%	2.4%	6.1%	12.8%	8.0%	6.4%	4.4%

Note: 2019 Data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 103: Emerging market nominal equity and bond returns (annualised)

	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	Returns by Decade: 1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																															
China	0.3%	1.9%	8.7%						7.0%																				11.1%	1.9%
India	7.0%	9.1%	10.7%						14.2%																			21.1%	15.2%	9.1%
Korea	4.2%	3.9%	6.7%	16.8%				16.6%	9.6%																	40.7%	29.2%	4.6%	9.9%	3.9%
Malaysia	1.2%	5.5%	5.1%						8.2%																		12.8%	5.6%	7.8%	5.5%
Mexico	2.2%	4.8%	14.0%						13.8%																			35.9%	18.3%	4.8%
Philippines	3.4%	11.0%	5.5%						8.2%																			9.3%	5.1%	11.0%
Russia	16.6%	3.7%	11.6%						16.1%																				16.6%	3.7%
South Africa	5.0%	10.5%	11.9%	15.8%				16.8%	14.7%																	16.0%	24.1%	13.9%	14.7%	10.5%
Taiwan	7.0%	7.1%	5.4%						6.3%																			3.9%	0.9%	7.1%
Thailand	5.2%	12.3%	3.9%						12.0%																		27.3%	-2.4%	8.8%	12.3%
BOND																														
China	4.1%	4.0%							4.9%																				5.9%	4.0%
India	8.4%	7.0%	8.8%	7.7%	6.5%	5.6%	4.0%	7.8%	8.2%	5.7%	6.5%	5.4%	5.6%	4.6%	4.6%	4.5%	4.4%	4.2%	3.4%	2.3%	-0.3%	5.6%	7.7%	6.0%	3.0%	4.2%	4.9%	4.4%	14.1%	8.5%	7.0%
Korea	4.4%	6.5%	8.9%	15.7%				14.8%	7.0%																	28.5%	27.2%	22.1%	15.7%	8.4%	6.5%
Malaysia	5.1%	4.6%	5.5%	7.6%				7.3%	5.3%																		11.3%	9.0%	7.6%	5.5%	4.6%
Mexico	4.9%	7.0%	15.2%						11.4%																				14.5%	7.0%
Philippines	4.6%	7.8%							13.0%																				16.3%	7.8%
Russia	18.2%	9.0%							17.2%																				16.8%	9.0%
South Africa	8.7%	9.2%	12.3%	11.5%	8.0%	7.2%	4.2%	11.8%	11.5%								4.6%	5.6%	3.7%	4.8%	2.0%	4.8%	4.8%	3.5%	5.3%	4.9%	7.4%	11.0%	17.9%	12.1%	9.2%
Taiwan	2.7%	1.7%	5.1%						4.0%																				6.9%	1.7%
Thailand	4.8%	5.3%	8.7%						6.9%																			13.6%	13.7%	7.9%	5.3%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 104: Emerging market real equity and bond returns (annualised)

	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	Returns by Decade: 1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																															
China	-1.4%	-0.5%	6.2%						4.9%																				8.9%	-0.5%
India	3.1%	2.9%	3.9%						7.9%																			10.6%	8.6%	2.9%
Korea	3.1%	2.3%	3.8%	9.7%				9.7%	7.1%																	22.3%	20.3%	-0.9%	6.5%	2.3%
Malaysia	-0.5%	3.3%	2.6%						6.0%																		9.0%	1.7%	5.5%	3.3%
Mexico	-1.3%	1.0%	5.5%						8.7%																			13.7%	12.7%	1.0%
Philippines	0.8%	7.7%	0.6%						3.9%																			0.5%	-0.2%	7.7%
Russia	10.6%	-2.8%	-4.7%						4.7%																				3.1%	-2.8%
South Africa	0.1%	5.3%	5.9%	6.2%				7.1%	8.8%																	5.4%	8.3%	4.2%	8.1%	5.3%
Taiwan	6.1%	6.1%	4.2%						5.3%																			1.0%	0.0%	6.1%
Thailand	4.6%	10.6%	1.3%						9.9%																			21.1%	-6.9%	6.1%	10.6%
BOND																															
China	2.3%	1.5%							2.8%																				3.8%	1.5%
India	4.4%	0.9%	2.1%	0.1%	1.2%	0.7%	1.1%	0.1%	2.2%									3.2%	3.8%	1.3%	-5.3%	5.0%	11.1%	-3.6%	1.6%	-1.6%	-2.6%	-4.0%	4.2%	2.3%	0.9%
Korea	3.3%	4.8%	6.0%	8.7%				8.0%	4.6%																	13.4%	10.5%	13.6%	9.6%	5.1%	4.8%
Malaysia	3.4%	2.5%	3.1%	4.0%				3.7%	3.1%																		5.4%	5.4%	3.6%	3.2%	2.5%
Mexico	1.3%	3.2%	6.5%						6.4%																				9.1%	3.2%
Philippines	1.9%	4.6%							8.5%																				10.5%	4.6%
Russia	12.1%	2.2%							5.6%																				3.2%	2.2%
South Africa	3.6%	4.0%	6.2%	2.3%	2.4%	2.2%	2.0%	2.5%	5.9%											6.0%	-3.0%	4.4%	5.3%	-1.2%	1.6%	2.2%	-2.4%	-3.2%	7.9%	5.7%	4.0%
Taiwan	1.8%	0.7%	3.9%						3.0%																				5.9%	0.7%
Thailand	4.3%	3.7%	6.0%						4.9%																			8.1%	8.5%	5.3%	3.7%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 105: Emerging market USD equity and bond returns (annualised)

										Returns by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
EQUITY																														
China	-2.5%	1.4%	9.4%						7.8%																				13.3%	1.4%
India	4.4%	4.5%	7.1%						11.4%																			10.2%	14.5%	4.5%
Korea	2.1%	3.5%	4.8%	13.6%				13.4%	9.5%																	34.3%	24.9%	-0.7%	9.6%	3.5%
Malaysia	-2.5%	3.3%	3.0%						7.7%																		10.4%	2.1%	8.9%	3.3%
Mexico	-3.9%	0.4%	7.9%						10.0%																			19.8%	14.5%	0.4%
Philippines	0.3%	9.7%	2.3%						6.7%																			2.3%	3.6%	9.7%
Russia	13.4%	-4.2%	-0.8%						9.9%																				15.4%	-4.2%
South Africa	-0.6%	2.8%	5.6%	8.9%				9.8%	9.6%																	14.3%	11.0%	4.2%	12.6%	2.8%
Taiwan	7.2%	7.3%	4.6%						6.4%																			2.0%	0.7%	7.3%
Thailand	6.7%	13.2%	3.1%						12.9%																		24.3%	-6.0%	10.0%	13.2%
BOND																														
China	1.2%	3.5%							5.6%																				7.9%	3.5%
India	5.7%	2.5%	5.3%	3.0%	2.9%	2.8%	2.7%	3.0%	5.5%				6.9%	3.8%	5.0%	6.0%	0.5%	2.7%	2.9%	2.3%	2.8%	3.5%	5.7%	2.2%	2.9%	-0.5%	4.3%	-3.2%	3.8%	7.8%	2.5%
Korea	2.3%	6.0%	7.1%	12.5%				11.7%	6.9%																	7.3%	21.4%	18.0%	9.9%	8.1%	6.0%
Malaysia	1.3%	2.5%	3.4%	6.9%				6.6%	4.8%																		15.1%	6.7%	3.9%	6.6%	2.5%
Mexico	-1.4%	2.5%	9.0%						7.7%																				10.9%	2.5%
Philippines	1.4%	6.5%							11.4%																				14.6%	6.5%
Russia	14.9%	0.8%							10.9%																				15.6%	0.8%
South Africa	2.9%	1.6%	6.0%	4.9%	4.5%	4.1%	3.4%	5.0%	6.6%								2.6%	5.6%	3.8%	4.8%	-0.6%	7.6%	2.6%	0.0%	5.3%	4.9%	5.9%	-0.7%	7.9%	10.1%	1.6%
Taiwan	2.9%	1.9%	4.4%						4.1%																				6.7%	1.9%
Thailand	6.3%	6.2%	7.9%						7.8%																			10.9%	9.5%	9.1%	6.2%

Note: 2019 data to 31 Aug 2019. Source : Deutsche Bank, GFD

Figure 106: Developed market nominal and real GDP growth for different time horizons

										Growth by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Nominal GDP																														
Australia	4.4%	4.7%	5.9%	8.4%				8.4%	5.9%																8.0%	13.8%	11.8%	5.1%	7.1%	4.7%
Austria	3.7%	3.4%	3.6%	5.8%		15.4%	22.7%	5.6%	3.6%									0.8%	2.5%	11.5%				13.4%	8.6%	10.9%	6.3%	4.8%	3.6%	3.4%
Belgium	2.9%	2.9%	3.5%	5.7%		7.2%	8.3%	5.6%	3.4%					0.0%	4.5%	4.0%	1.4%	1.0%	1.2%	1.8%			21.7%	4.6%	8.0%	11.0%	6.6%	4.7%	3.6%	2.9%
Canada	3.1%	4.0%	4.4%	6.8%	6.5%	6.9%	6.9%	6.8%	4.4%									4.2%	2.3%	8.5%	8.7%	4.1%	-0.9%	11.9%	8.3%	8.4%	13.0%	8.6%	4.3%	4.4%	4.0%
Denmark	3.0%	2.9%	3.4%	6.5%	6.2%	6.5%	6.6%	6.5%	3.2%			-1.8%	2.2%	2.8%	4.4%	3.2%	1.7%	1.6%	3.2%	4.2%	12.3%	0.4%	3.4%	8.8%	7.1%	10.0%	14.0%	8.2%	4.6%	3.3%	2.9%
France	2.3%	2.2%	3.0%	6.4%		9.4%	11.6%	6.3%	2.9%			2.5%	1.0%	1.2%	2.4%	3.6%	-1.0%	1.8%	1.7%	2.1%			4.3%	32.5%	11.7%	10.1%	13.9%	9.6%	3.6%	3.3%	2.2%
Germany	3.4%	3.5%	2.7%	4.7%		34.1%	59.3%	4.5%	2.8%							3.7%	3.6%	3.2%	3.4%	3.4%						10.0%	8.8%	4.8%	4.7%	1.8%	3.5%
Greece	1.1%	-2.3%	4.0%	11.6%	50.6%	43.5%	71.0%	11.3%	2.8%					-0.1%	7.4%	1.5%	4.0%	4.5%	2.1%	2.4%	23.7%	18.8%	5.4%	2088.2%	14.5%	10.6%	20.6%	20.3%	13.2%	7.8%	-2.3%
Hong Kong	5.7%	6.0%	4.3%	10.9%				10.8%	4.0%																	11.2%	21.0%	16.9%	9.1%	2.6%	6.0%
Ireland	11.9%	7.2%	8.3%	11.0%	7.3%	6.9%	4.1%	11.0%	7.3%								0.6%	0.2%	1.3%	-0.5%	9.9%	2.6%	0.8%	1.4%	5.2%	9.0%	18.4%	12.4%	11.1%	6.3%	7.2%
Italy	1.8%	1.2%	3.0%	8.8%	11.3%	10.9%	12.7%	8.4%	2.3%								1.3%	1.2%	1.0%	3.6%	15.1%	7.2%	1.6%	47.0%	9.9%	8.8%	19.5%	14.6%	6.6%	3.0%	1.2%
Japan	2.5%	1.6%	0.4%	4.3%	11.0%	10.8%	15.7%	4.1%	0.4%										9.3%	5.0%	15.1%	0.5%	6.7%	58.8%	15.1%	17.1%	13.0%	6.1%	2.1%	-0.7%	1.6%
Netherlands	3.8%	2.6%	4.2%	6.0%	6.0%	6.2%	6.5%	5.8%	3.9%		1.1%	0.5%	2.4%	-0.9%	1.7%	3.3%	1.3%	1.8%	1.2%	3.0%	11.4%	1.6%	-2.2%	13.1%	7.9%	10.5%	13.1%	4.3%	6.2%	4.1%	2.6%
New Zealand	4.7%	4.7%	5.0%	8.5%	7.3%	7.3%	6.6%	8.4%	5.1%								6.4%	0.8%	1.6%	5.8%	8.6%	0.7%	5.0%	9.6%	8.4%	7.5%	14.4%	14.0%	4.2%	5.6%	4.7%
Norway	3.5%	4.4%	5.9%	8.3%	6.6%	7.1%	6.3%	8.2%	5.7%					1.1%	5.0%	3.6%	2.1%	1.5%	3.3%	2.1%	16.8%	-3.5%	3.7%	8.1%	8.9%	8.4%	14.4%	10.3%	5.9%	6.8%	4.4%
Portugal	3.8%	1.7%	4.3%	11.0%	7.6%	7.0%	4.4%	11.0%	3.2%									3.2%	2.0%	1.4%	7.0%	-0.9%	1.4%	7.6%	5.6%	8.4%	16.0%	23.7%	11.1%	3.9%	1.7%
Spain	3.8%	1.5%	4.6%	9.5%	9.5%	8.7%	8.2%	9.3%	4.1%							-0.2%	4.4%	0.3%	1.1%	2.3%	7.4%	3.6%	1.7%	13.3%	15.4%	13.8%	19.5%	13.5%	7.8%	6.1%	1.5%
Sweden	4.9%	4.3%	4.3%	7.2%	6.4%	6.6%	6.3%	7.1%	4.2%	5.9%	4.9%	0.1%	2.6%	1.2%	3.8%	2.3%	3.4%	1.2%	4.2%	3.0%	13.4%	-1.8%	3.7%	8.1%	8.9%	9.1%	11.7%	11.4%	5.0%	3.9%	4.3%
Switzerland	1.6%	1.8%	2.3%	4.4%	4.7%	4.8%	5.2%	4.3%	2.4%							2.1%	2.5%	0.9%	4.1%	3.5%	7.0%	3.7%	-1.0%	7.5%	6.2%	9.1%	6.9%	7.6%	2.8%	3.1%	1.8%
UK	3.5%	3.6%	4.1%	7.9%	6.1%	6.1%	4.9%	7.8%	3.8%	3.2%	0.2%	0.2%	3.1%	0.0%	2.9%	3.5%	1.7%	2.1%	2.5%	1.3%	10.3%	-2.0%	2.3%	7.6%	7.1%	7.3%	16.0%	10.8%	5.3%	4.1%	3.6%
US	4.0%	4.0%	4.4%	6.3%	5.7%	6.1%	6.0%	6.3%	4.1%	1.8%	4.2%	1.8%	7.9%	1.3%	6.1%	6.4%	1.7%	3.9%	3.4%	6.7%	9.7%	2.2%	-1.1%	11.2%	6.9%	7.0%	10.1%	7.8%	5.6%	4.0%	4.0%
Real GDP																														
Australia	2.6%	2.7%	3.2%	3.2%				3.1%	3.0%				6.8%	10.7%	12.1%												3.3%	3.7%	3.2%	3.1%	2.7%
Austria	2.2%	1.7%	1.8%	2.5%		3.3%	3.8%	2.5%	1.8%									1.5%	2.6%	9.8%				10.7%	3.2%	5.2%	1.8%	2.3%	1.7%	1.7%
Belgium	1.5%	1.4%	2.4%	2.5%	2.4%	2.1%	1.9%	2.4%	1.6%						2.7%	2.6%	1.9%	2.4%	1.8%	2.0%	-1.4%	4.6%	0.6%	0.0%	2.0%	4.8%	3.5%	1.9%	3.8%	1.7%	1.4%
Canada	3.5%	3.1%	2.8%	3.0%	3.6%	3.7%	4.3%	3.0%	2.7%									3.5%	3.2%	5.9%	2.8%	4.6%	0.5%	5.9%	5.3%	5.2%	4.1%	2.9%	2.6%	2.1%	3.1%
Denmark	2.1%	1.7%	1.6%	1.7%	2.6%	2.6%	3.2%	1.7%	1.4%				1.1%	2.9%	1.7%	2.0%	2.2%	2.1%	3.2%	3.3%	1.8%	3.7%	2.5%	1.9%	3.6%	5.5%	2.0%	1.4%	2.7%	1.0%	1.7%
France	1.5%	1.4%	1.6%	2.4%	2.8%	2.3%	2.3%	2.3%	1.5%				1.4%	2.1%	1.5%	1.7%	-0.3%	2.0%	2.4%	1.0%	-1.8%	7.0%	-1.1%	0.1%	5.0%	5.7%	4.5%	2.6%	2.0%	1.5%	1.4%
Germany	1.7%	2.0%	1.4%	2.0%	3.4%	2.8%	3.5%	1.9%	1.4%							2.6%	1.9%	2.5%	3.4%	2.7%	-2.6%	5.3%	3.3%	2.1%	8.7%	4.8%	3.1%	2.5%	1.6%	0.8%	2.0%
Greece	0.8%	-2.1%	0.8%	1.7%	3.2%	3.2%	4.4%	1.6%	0.4%					-0.5%	4.0%	2.1%	1.9%	4.2%	0.5%	2.4%	4.3%	4.8%	3.8%	0.8%	7.4%	6.8%	5.4%	0.9%	1.7%	2.7%	-2.1%
Hong Kong	2.7%	3.2%	3.3%	6.0%				5.9%	3.6%																	8.5%	9.3%	7.4%	5.9%	4.2%	3.2%
Ireland	10.2%	6.2%	6.1%	5.0%				5.1%	5.2%														0.8%	1.3%	1.4%	4.5%	4.6%	3.0%	7.8%	3.6%	6.2%
Italy	1.0%	0.3%	0.7%	1.8%	2.7%	2.5%	3.0%	1.7%	0.4%								1.0%	1.4%	1.3%	2.7%	0.0%	3.7%	1.5%	0.5%	6.4%	6.4%	4.0%	2.9%	1.4%	0.5%	0.3%
Japan	0.4%	0.9%	0.7%	2.7%	3.5%	3.4%	4.0%	2.6%	0.7%									2.9%	3.0%	1.5%	4.5%	1.8%	4.9%	-4.1%	8.8%	10.7%	5.3%	5.4%	1.6%	0.5%	0.9%
Netherlands	2.4%	1.5%	2.1%	2.5%	2.9%	2.7%	3.0%	2.4%	1.7%				1.7%	0.9%	0.9%	2.0%	2.3%	3.0%	2.0%	1.4%	2.4%	4.7%	1.0%	1.4%	3.9%	5.7%	3.9%	2.2%	3.3%	1.7%	1.5%
New Zealand	3.3%	2.8%	3.0%	2.6%	2.9%	3.0%	3.2%	2.6%	3.0%									3.3%	2.8%	4.3%	2.6%	2.1%	3.1%	2.6%	3.9%	4.1%	2.6%	1.8%	2.7%	2.9%	2.8%
Norway	1.7%	1.6%	2.1%	2.7%	3.1%	3.0%	3.2%	2.8%	1.7%					2.0%	3.0%	3.2%	1.8%	1.7%	2.2%	1.9%	3.1%	3.4%	3.3%	2.6%	3.7%	4.7%	4.4%	2.4%	3.6%	1.9%	1.6%
Portugal	2.1%	0.6%	0.9%	1.6%	2.6%	2.2%	2.7%	1.4%	0.9%								0.6%	2.2%	2.1%	0.5%	0.0%	4.3%	2.1%	2.9%	3.5%	4.8%	2.7%	2.6%	1.2%	0.9%	0.6%
Spain	3.0%	1.0%	2.4%	2.7%	2.9%	2.7%	2.7%	2.6%	2.0%							0.1%	3.2%	1.2%	1.3%	1.8%	0.9%	4.2%	-2.7%	2.2%	4.7%	7.9%	3.9%	2.8%	3.0%	2.7%	1.0%
Sweden	2.7%	2.6%	2.5%	2.4%	2.7%	2.5%	2.5%	2.4%	2.4%	0.6%	-0.3%	0.4%	0.7%	0.5%	0.6%	0.9%	1.5%	1.2%	2.4%	1.4%	1.1%	3.4%	3.5%	1.4%	2.8%	3.8%	2.4%	3.4%	1.8%	2.0%	2.6%
Switzerland	1.8%	1.9%	1.9%	1.6%	2.5%	2.3%	2.9%	1.5%	1.9%							1.5%	1.1%	3.0%	3.6%	2.8%	0.4%	5.0%	0.3%	2.6%	4.5%	4.7%	1.6%	1.2%	1.2%	1.9%	1.9%
UK	2.3%	2.1%	2.2%	2.3%	2.2%	2.0%	1.9%	2.2%	2.0%	1.5%	0.9%	2.5%	3.0%	1.5%	2.0%	1.8%	1.9%	2.4%	2.2%	1.0%	1.4%	0.7%	2.1%	1.6%	3.1%	3.4%	2.6%	2.6%	2.2%	1.7%	2.1%
US	2.3%	2.3%	2.4%	2.8%	3.2%	3.2%	3.5%	2.8%	2.2%	2.3%	3.7%	5.3%	6.1%	4.2%	4.2%	1.9%	6.6%	4.7%	4.3%	4.6%	2.3%	3.3%	0.9%	5.4%	4.3%	4.4%	3.3%	3.1%	3.4%	1.8%	2.3%

Source : Deutsche Bank, GFD

Figure 107: Developed market nominal and real GDP growth for different time horizons in USD

	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	Growth by Decade: 1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Nominal GDP																															
Australia	1.2%	2.2%	5.4%	7.4%				7.4%	6.6%																	8.0%	13.7%	8.1%	3.2%	10.5%	2.2%
Austria	2.5%	1.0%	3.1%	7.4%		5.1%	3.7%	7.3%	3.4%									0.9%	2.2%	11.6%					13.5%	8.7%	19.3%	6.8%	3.4%	7.3%	1.0%
Belgium	1.7%	0.5%	3.1%	6.4%		5.5%	4.9%	6.3%	3.2%					-0.1%	4.6%	5.9%	-0.5%	1.0%	1.2%	1.8%				15.6%	4.6%	8.1%	17.5%	4.1%	3.5%	7.3%	0.5%
Canada	0.6%	1.7%	4.7%	6.4%	6.3%	6.6%	6.9%	6.2%	5.2%									4.2%	2.2%	8.3%	7.9%	4.7%	-1.8%	11.9%	10.0%	7.1%	12.0%	8.7%	2.0%	7.8%	1.7%
Denmark	1.6%	0.5%	3.1%	6.8%	6.0%	6.0%	5.5%	6.7%	3.1%			-0.3%	4.7%	3.4%	5.0%	4.9%	-0.2%	1.6%	3.2%	4.2%	8.6%	3.8%	0.1%	5.7%	7.1%	9.1%	17.8%	6.0%	3.5%	7.0%	0.5%
France	1.1%	-0.1%	2.7%	6.4%		5.2%	4.5%	6.2%	2.7%			2.8%	1.1%	1.1%	2.6%	5.5%	-2.8%	1.8%	1.8%	2.1%			-1.4%	7.9%	8.0%	8.7%	17.7%	5.7%	2.4%	7.0%	-0.1%
Germany	2.1%	1.2%	2.3%	6.3%		5.3%	4.7%	6.2%	2.6%							5.6%	1.7%	3.1%	3.4%	3.5%						11.3%	17.4%	5.0%	3.3%	5.4%	1.2%
Greece	-0.2%	-4.5%	3.0%	6.6%	5.7%	6.6%	7.0%	6.2%	2.5%					-0.2%	7.7%	3.4%	2.0%	4.5%	2.1%	2.4%	20.8%	-7.2%	-0.8%	16.9%	6.9%	10.6%	18.5%	3.8%	5.2%	11.3%	-4.5%
Hong Kong	5.5%	5.9%	4.2%	10.4%				10.2%	3.9%																	10.4%	23.6%	11.6%	9.2%	2.6%	5.9%
Ireland	10.5%	4.8%	8.0%	9.9%	6.3%	5.8%	3.1%	9.9%	7.1%								-1.3%	0.2%	1.4%	-0.6%	7.1%	5.4%	-1.3%	-2.0%	5.2%	7.3%	17.1%	8.8%	9.0%	10.1%	4.8%
Italy	0.5%	-1.1%	2.8%	6.6%	6.0%	5.8%	5.5%	6.2%	2.2%								-1.2%	2.4%	0.4%	4.3%	4.8%	3.3%	1.2%	4.1%	9.9%	8.7%	16.5%	9.5%	2.2%	6.7%	-1.1%
Japan	4.7%	0.1%	0.1%	6.9%	6.7%	7.2%	7.5%	6.7%	0.6%										4.3%	5.0%	15.2%	0.4%	-0.9%	1.9%	15.1%	17.1%	17.7%	11.7%	5.7%	0.3%	0.1%
Netherlands	2.6%	0.3%	3.7%	7.3%	6.4%	6.4%	6.0%	7.1%	3.8%		0.5%	0.8%	2.4%	-0.9%	2.1%	5.0%	-0.8%	1.8%	1.2%	3.0%	10.6%	2.4%	0.6%	5.4%	8.0%	11.0%	20.6%	4.3%	4.8%	7.8%	0.3%
New Zealand	1.6%	3.8%	5.2%	7.4%	6.2%	6.2%	5.4%	7.3%	6.4%								4.4%	0.8%	1.7%	5.8%	5.8%	3.4%	5.1%	3.6%	8.3%	5.2%	13.0%	8.5%	2.9%	9.1%	3.8%
Norway	0.8%	0.4%	4.9%	7.9%	6.1%	6.3%	5.4%	7.8%	5.1%					1.7%	5.5%	5.3%	0.2%	1.5%	3.4%	2.1%	13.5%	-0.7%	2.0%	3.0%	8.9%	8.4%	18.7%	7.1%	3.9%	10.4%	0.4%
Portugal	2.5%	-0.6%	3.9%	7.0%	3.4%	2.8%	0.0%	6.9%	3.1%									3.2%	-1.7%	4.0%	-4.1%	-18.5%	-0.8%	7.2%	5.6%	8.5%	9.7%	10.9%	7.9%	7.6%	-0.6%
Spain	2.5%	-0.8%	4.2%	7.9%	5.9%	5.9%	4.7%	7.7%	3.9%							1.3%	2.1%	-0.2%	-0.8%	4.3%	8.1%	-0.2%	-1.2%	3.4%	5.7%	12.1%	20.2%	7.9%	3.4%	9.9%	-0.8%
Sweden	1.3%	1.6%	3.4%	5.9%	5.6%	5.8%	5.8%	5.8%	3.5%			0.4%	2.5%	0.8%	4.2%	3.9%	1.4%	1.2%	4.3%	2.9%	10.8%	0.6%	2.4%	5.9%	8.9%	9.1%	14.1%	7.0%	1.7%	5.7%	1.6%
Switzerland	1.9%	2.4%	3.5%	7.6%	6.6%	6.3%	5.5%	7.5%	4.1%							4.0%	0.5%	0.9%	4.1%	3.6%	6.1%	4.6%	0.4%	7.9%	6.2%	9.1%	18.1%	8.0%	2.4%	7.6%	2.4%
UK	-0.7%	1.1%	3.2%	6.5%	5.0%	4.9%	3.8%	6.4%	2.5%	3.2%	0.3%	0.9%	3.0%	-0.1%	3.0%	5.4%	-0.2%	2.1%	2.6%	1.2%	7.5%	0.6%	0.2%	4.0%	7.1%	5.6%	15.1%	7.4%	5.4%	4.1%	1.1%
US	4.0%	4.0%	4.4%	6.3%	5.7%	6.1%	6.0%	6.3%	4.1%	1.8%	4.2%	1.8%	7.9%	1.3%	6.1%	6.4%	1.7%	3.9%	3.4%	6.7%	9.7%	2.2%	-1.1%	11.2%	6.9%	7.0%	10.1%	7.8%	5.6%	4.0%	4.0%
Real GDP																															
Australia	-0.5%	0.2%	2.7%	2.3%				2.2%	3.7%				6.6%	10.3%	12.6%												3.2%	0.2%	1.4%	6.4%	0.2%
Austria	0.9%	-0.6%	1.4%	4.1%		-5.9%	-12.3%	4.1%	1.6%									1.7%	2.3%	9.9%					10.7%	3.2%	13.2%	2.3%	0.9%	5.3%	-0.6%
Belgium	0.3%	-0.9%	2.0%	3.2%	1.2%	0.5%	-1.3%	3.1%	1.5%						2.9%	4.5%	0.0%	2.4%	1.8%	2.0%	-8.4%	-7.1%	2.4%	-5.0%	2.0%	4.9%	9.6%	-0.5%	2.6%	5.4%	-0.9%
Canada	1.1%	0.9%	3.1%	2.5%	3.4%	3.5%	4.2%	2.4%	3.5%									3.6%	3.2%	5.8%	2.0%	5.2%	-0.5%	5.9%	7.0%	3.9%	3.2%	3.0%	0.3%	5.4%	0.9%
Denmark	0.8%	-0.7%	1.3%	2.0%	2.3%	2.1%	2.2%	2.0%	1.3%				3.7%	3.5%	2.2%	3.7%	0.3%	2.1%	3.2%	3.4%	-1.5%	7.3%	-0.8%	-1.1%	3.7%	4.6%	5.5%	-0.7%	1.5%	4.6%	-0.7%
France	0.3%	-1.0%	1.3%	2.3%	-1.2%	-1.7%	-4.2%	2.2%	1.3%				1.5%	2.0%	1.7%	3.5%	-2.1%	2.0%	2.5%	1.0%	-8.9%	-1.6%	-6.5%	-18.5%	1.5%	4.4%	7.9%	-1.1%	0.8%	5.1%	-1.0%
Germany	0.5%	-0.4%	1.0%	3.6%	-20.7%	-19.3%	-32.0%	3.5%	1.2%							4.5%	0.1%	2.5%	3.4%	2.7%	-23.9%	-91.5%	8.8%	-23.0%	8.8%	6.1%	11.3%	2.7%	0.2%	4.4%	-0.4%
Greece	-0.4%	-4.3%	-0.1%	-2.9%	-27.5%	-23.3%	-34.7%	-3.1%	0.1%					-0.6%	4.2%	3.9%	0.0%	4.2%	0.5%	2.4%	1.8%	-18.1%	-2.3%	-94.6%	0.2%	6.8%	3.5%	-12.9%	-5.5%	6.1%	-4.3%
Hong Kong	2.5%	3.2%	3.2%	5.4%				5.4%	3.6%																	7.8%	11.7%	2.5%	6.0%	4.2%	3.2%
Ireland	8.8%	3.8%	5.8%	4.0%				4.0%	5.0%														-1.3%	-2.2%	1.4%	2.9%	3.4%	-0.3%	5.7%	7.3%	3.8%
Italy	-0.3%	-2.0%	0.5%	-0.2%	-2.1%	-2.3%	-3.6%	-0.3%	0.3%								-1.5%	2.6%	0.8%	3.4%	-8.9%	-0.1%	1.1%	-28.8%	6.4%	6.3%	1.5%	-1.7%	-2.8%	4.1%	-2.0%
Japan	2.5%	-0.6%	0.4%	5.2%	-0.5%	0.0%	-3.3%	5.1%	0.9%									1.3%	-1.7%	1.5%	4.6%	1.7%	-2.6%	-38.5%	8.8%	10.7%	9.6%	10.9%	5.1%	1.5%	-0.6%
Netherlands	1.1%	-0.8%	1.6%	3.8%	3.2%	2.9%	2.4%	3.7%	1.6%				1.6%	0.9%	1.3%	3.7%	0.2%	3.1%	2.0%	1.4%	1.7%	5.5%	3.8%	-5.5%	3.9%	6.1%	10.8%	2.1%	1.9%	5.3%	-0.8%
New Zealand	0.2%	2.0%	3.2%	1.5%	1.8%	1.9%	2.1%	1.5%	4.2%									3.2%	2.9%	4.3%	0.0%	4.8%	3.3%	-3.0%	3.8%	1.8%	1.3%	-3.2%	1.4%	6.4%	2.0%
Norway	-1.0%	-2.3%	1.2%	2.4%	2.6%	2.3%	2.3%	2.4%	1.2%					2.5%	3.5%	4.9%	-0.1%	1.6%	2.3%	1.9%	0.2%	6.4%	1.6%	-2.3%	3.8%	4.7%	8.3%	-0.6%	1.6%	5.3%	-2.3%
Portugal	0.9%	-1.7%	0.5%	-2.0%	-1.5%	-1.9%	-1.6%	-2.3%	0.8%								-1.2%	2.2%	-1.5%	3.0%	-10.3%	-14.1%	-0.2%	2.5%	3.5%	4.9%	-2.9%	-8.1%	-1.7%	4.5%	-1.7%
Spain	1.7%	-1.3%	2.0%	1.2%	-0.4%	0.1%	-0.6%	1.1%	1.9%							1.6%	0.8%	0.8%	-0.6%	3.8%	1.5%	0.5%	-5.5%	-6.7%	-4.1%	6.3%	4.5%	-2.3%	-1.2%	6.4%	-1.3%
Sweden	-0.8%	0.0%	1.6%	1.2%	2.0%	1.7%	2.1%	1.2%	1.7%			0.7%	0.7%	0.2%	1.1%	2.4%	-0.4%	1.2%	2.5%	1.3%	-1.2%	5.9%	2.2%	-0.7%	2.8%	3.8%	4.6%	-0.7%	-1.4%	3.8%	0.0%
Switzerland	2.2%	2.5%	3.1%	4.6%	4.3%	3.8%	3.2%	4.6%	3.6%							3.3%	-0.8%	3.0%	3.6%	2.9%	-0.4%	5.9%	1.7%	3.0%	4.4%	4.6%	12.2%	1.6%	0.8%	6.4%	2.5%
UK	-1.8%	-0.3%	1.3%	1.0%	1.1%	0.9%	0.9%	0.9%	0.7%	1.5%	1.1%	3.3%	2.9%	1.4%	2.1%	3.7%	0.0%	2.4%	2.3%	0.9%	-1.2%	3.4%	0.0%	-1.9%	3.1%	1.8%	1.8%	-0.6%	2.2%	1.7%	-0.3%
US	2.3%	2.3%	2.4%	2.8%	3.2%	3.2%	3.5%	2.8%	2.2%	2.3%	3.7%	5.3%	6.1%	4.2%	4.2%	1.9%	6.6%	4.7%	4.3%	4.6%	2.3%	3.3%	0.9%	5.4%	4.3%	4.4%	3.3%	3.1%	3.4%	1.8%	2.3%

Source : Deutsche Bank, GFD

Figure 108: Emerging market nominal and real GDP growth for different time horizons

										Growth by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Nominal GDP																														
China	8.8%	10.9%	12.8%	13.2%				13.2%	12.3%																3.1%	7.6%	15.1%	18.6%	14.4%	10.9%
India	10.9%	13.1%	12.8%	13.3%	9.2%	8.5%	5.2%	13.4%	12.5%									1.7%	1.1%	3.6%	6.2%	0.5%	-2.8%	13.0%	5.1%	11.4%	11.0%	15.6%	14.7%	12.1%	13.1%
Korea	4.5%	4.8%	6.9%	14.5%	23.1%			14.2%	6.4%													0.0%				25.7%	31.1%	17.3%	13.2%	7.7%	4.8%
Malaysia	6.3%	7.4%	8.2%	10.3%				10.4%	7.9%																4.7%	7.3%	15.3%	8.2%	12.3%	8.6%	7.4%
Mexico	6.1%	6.6%	10.7%	24.1%	16.4%	19.7%	16.7%	24.4%	7.8%											8.4%	75.6%	-0.1%	4.8%	16.0%	15.2%	10.9%	22.7%	68.3%	23.9%	8.0%	6.6%
Philippines	8.5%	9.0%	9.7%	13.4%				13.3%	9.3%																7.1%	10.4%	20.1%	16.6%	12.2%	9.5%	9.0%
Russia	7.5%	10.6%	23.3%	29.6%		30.8%	31.4%	30.0%	19.3%										5.1%	3.7%			28.7%	8.5%	6.2%	6.8%	5.3%	2.7%	148.4%	23.2%	10.6%
South Africa	5.7%	7.1%	9.6%	12.8%	9.7%			12.8%	9.4%													1.7%	4.1%	9.6%	8.1%	9.8%	15.8%	17.6%	12.4%	11.5%	7.1%
Taiwan	2.2%	3.3%	4.0%	9.4%	23.3%			9.3%	3.1%												10.9%	3.1%	5.7%	211.5%	33.4%	14.4%	19.8%	12.7%	9.3%	2.8%	3.3%
Thailand	5.2%	5.8%	6.3%	10.3%				10.2%	6.3%																8.0%	10.4%	15.8%	12.6%	10.1%	7.3%	5.8%
Real GDP																														
China	6.7%	7.7%	9.0%	10.2%				10.0%	8.9%																	2.2%	7.3%	9.7%	16.2%	10.3%	7.7%
India	7.5%	7.4%	6.9%	5.6%	3.7%	3.3%	1.7%	5.7%	7.1%										0.6%	1.9%	0.3%	0.2%	0.8%	0.5%	3.9%	4.0%	2.8%	5.9%	5.4%	6.8%	7.4%
Korea	2.8%	3.3%	4.3%	6.8%	4.4%			6.7%	4.3%													1.3%	3.8%	-2.9%	4.6%	4.0%	10.4%	8.7%	7.0%	4.7%	3.3%
Malaysia	4.9%	5.4%	6.3%	6.8%	5.1%			6.9%	6.6%													6.1%	1.7%	0.8%	2.1%	6.8%	7.9%	5.7%	7.2%	7.8%	5.4%
Mexico	1.7%	2.5%	2.5%	3.0%	3.3%	3.0%	3.1%	2.9%	2.3%											3.2%	0.7%	0.9%	1.9%	1.8%	6.3%	7.1%	4.7%	1.8%	3.9%	2.0%	2.5%
Philippines	6.4%	6.3%	5.0%	4.2%	3.9%			4.2%	5.3%												6.6%	3.6%	3.0%	-0.1%	6.5%	4.7%	5.8%	1.9%	2.8%	4.4%	6.3%
Russia	0.5%	1.8%	4.1%	2.1%				2.0%	3.7%														6.1%	0.8%	5.2%	5.0%	3.1%	1.8%	-1.6%	5.4%	1.8%
South Africa	1.0%	1.8%	2.6%	2.4%	3.2%			2.3%	2.7%													1.3%	4.5%	4.4%	4.7%	5.3%	3.3%	2.0%	1.6%	3.5%	1.8%
Taiwan	2.1%	3.3%	4.0%	6.1%	5.5%			6.0%	3.7%												2.2%	4.5%	2.5%	-0.8%	9.4%	9.5%	10.2%	6.8%	6.6%	3.8%	3.3%
Thailand	3.6%	3.7%	3.5%	6.7%				6.6%	4.0%																3.9%	8.3%	7.3%	7.2%	11.1%	4.3%	3.7%

Source : Deutsche Bank, GFD

Figure 109: Emerging market nominal and real GDP growth for different time horizons in USD

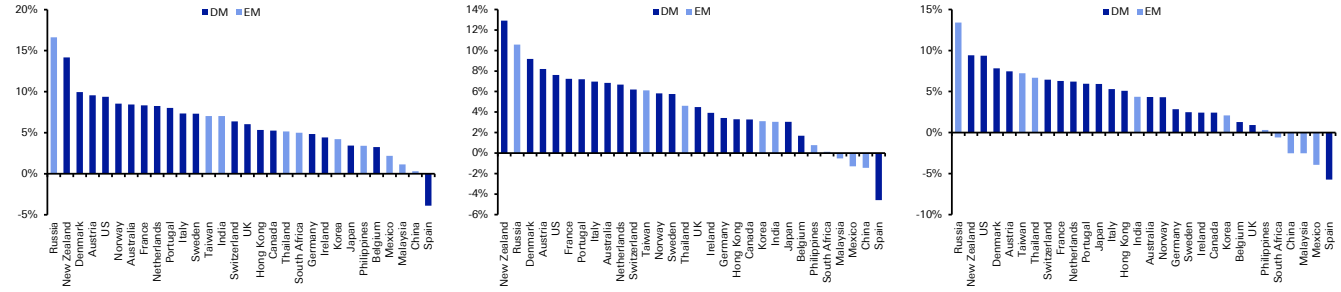
										Returns by Decade																				
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	since 1900	1900-1970	since 1971	since 1999	1800-1809	1810-1819	1820-1829	1830-1839	1840-1849	1850-1859	1860-1869	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Nominal GDP																														
China	6.6%	10.8%	13.7%	10.9%				10.8%	13.3%																	3.1%	13.1%	2.6%	12.1%	16.6%	10.8%
India	8.9%	8.7%	9.3%	8.4%	5.5%	5.7%	3.9%	8.4%	10.0%									0.3%	0.6%	3.7%	9.6%	-1.5%	-4.6%	9.0%	5.0%	6.4%	10.3%	7.2%	4.4%	11.3%	8.7%
Korea	3.3%	4.9%	5.2%	11.5%	7.8%			11.2%	6.6%													-0.3%				4.9%	25.2%	13.4%	7.6%	7.4%	4.9%
Malaysia	2.7%	5.4%	6.1%	9.7%				9.8%	7.5%																4.6%	7.2%	19.3%	6.0%	8.5%	9.7%	5.4%
Mexico	0.6%	2.5%	5.0%	7.1%	6.2%	6.4%	6.0%	7.1%	4.5%											8.7%	6.6%	-0.6%	-4.9%	10.9%	11.0%	10.9%	15.5%	4.4%	9.3%	4.6%	2.5%
Philippines	5.6%	7.9%	6.5%	7.7%				8.5%	7.8%																7.1%	3.3%	13.2%	4.6%	5.1%	7.9%	7.9%
Russia	5.7%	2.7%	9.9%	3.7%		4.9%	5.9%	3.6%	13.1%										5.7%	3.9%			28.4%	8.5%	-0.3%	7.9%	7.3%	2.7%	-13.2%	22.0%	2.7%
South Africa	1.6%	0.4%	3.7%	6.3%	6.1%			6.2%	4.9%													4.4%	1.9%	5.9%	8.0%	9.8%	14.1%	5.2%	2.9%	9.5%	0.4%
Taiwan	2.6%	3.6%	3.3%	10.0%	7.9%			9.9%	3.3%												11.1%	2.8%	-1.8%	6.3%	7.2%	15.6%	21.1%	16.4%	7.3%	2.6%	3.6%
Thailand	6.7%	6.7%	5.5%	9.4%				9.3%	7.2%																8.9%	10.5%	16.3%	9.9%	6.0%	8.5%	6.7%
Real GDP																														
China	4.5%	7.6%	9.9%	8.0%				7.7%	9.9%																	2.2%	12.8%	-2.2%	9.9%	12.5%	7.6%
India	5.5%	3.2%	3.5%	1.1%	0.3%	0.7%	0.4%	1.0%	4.6%										0.1%	2.0%	3.5%	-1.8%	-1.1%	-3.0%	3.9%	-0.6%	2.3%	-1.8%	-4.1%	6.1%	3.2%
Korea	1.6%	3.3%	2.7%	4.0%	-8.6%			3.9%	4.5%													1.0%	-3.6%	-43.2%	-30.0%	-13.2%	5.4%	5.1%	1.7%	4.4%	3.3%
Malaysia	1.5%	3.4%	4.2%	6.2%	4.5%			6.2%	6.1%													8.8%	-0.3%	-2.6%	2.1%	6.7%	11.6%	3.5%	3.6%	8.9%	3.4%
Mexico	-3.6%	-1.4%	-2.8%	-11.1%	-5.8%	-8.4%	-6.3%	-11.4%	-0.9%											3.5%	-38.9%	0.4%	-7.5%	-2.7%	2.4%	7.1%	-1.4%	-36.8%	-8.3%	-1.3%	-1.4%
Philippines	3.5%	5.3%	1.9%	-1.0%	0.6%			-0.1%	3.9%												6.1%	4.1%	3.1%	-0.1%	6.5%	-2.1%	-0.3%	-8.6%	-3.7%	2.9%	5.3%
Russia	-1.2%	-5.5%	-7.2%	-18.4%				-18.8%	-1.7%														5.8%	0.8%	-1.3%	6.1%	5.1%	1.8%	-65.6%	4.3%	-5.5%
South Africa	-2.9%	-4.6%	-2.9%	-3.5%	-0.1%			-3.7%	-1.5%													4.0%	2.4%	0.8%	4.7%	5.4%	1.9%	-8.8%	-7.0%	1.6%	-4.6%
Taiwan	2.5%	3.6%	3.3%	6.6%	-7.7%			6.5%	3.8%												2.4%	4.1%	-4.8%	-66.2%	-12.1%	10.6%	11.3%	10.3%	4.7%	3.6%	3.6%
Thailand	5.1%	4.6%	2.7%	5.9%				5.8%	4.9%																4.8%	8.3%	7.7%	4.7%	7.0%	5.5%	4.6%

Source : Deutsche Bank, GFD

LT Asset Returns in Charts

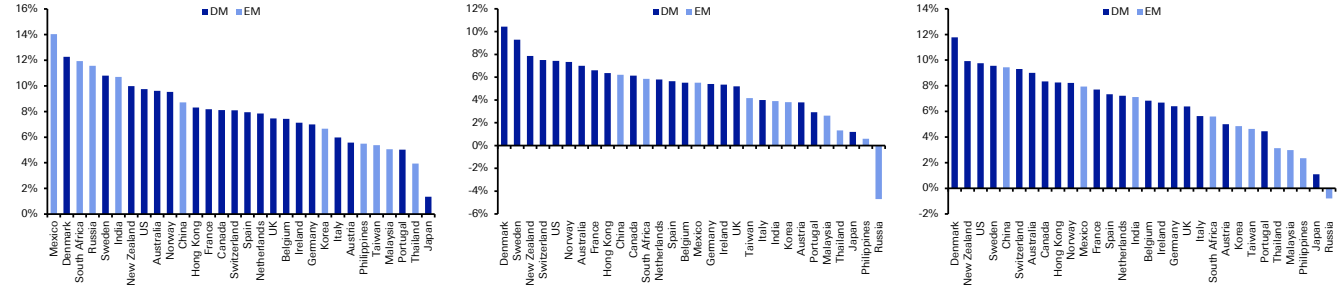
International equity return charts

Figure 110: Last 5 years annualised equity returns - nominal (left), real (middle), USD (right)



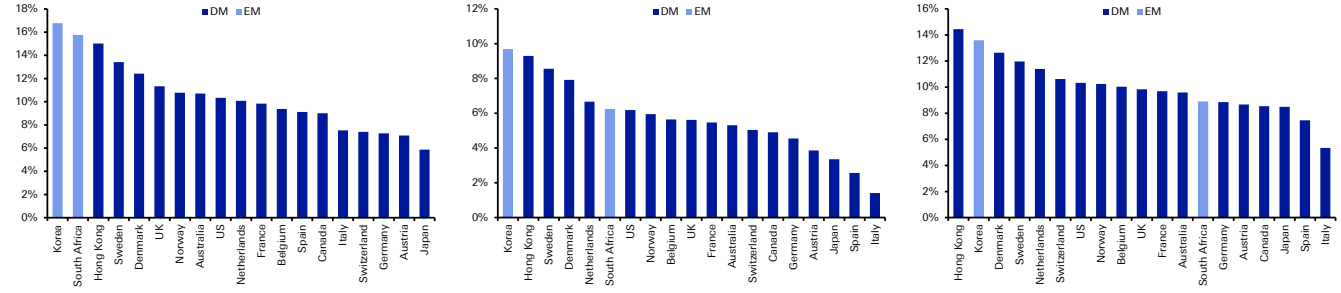
Source : Deutsche Bank, GFD

Figure 111: Last 25 years annualised equity returns - nominal (left), real (middle), USD (right)



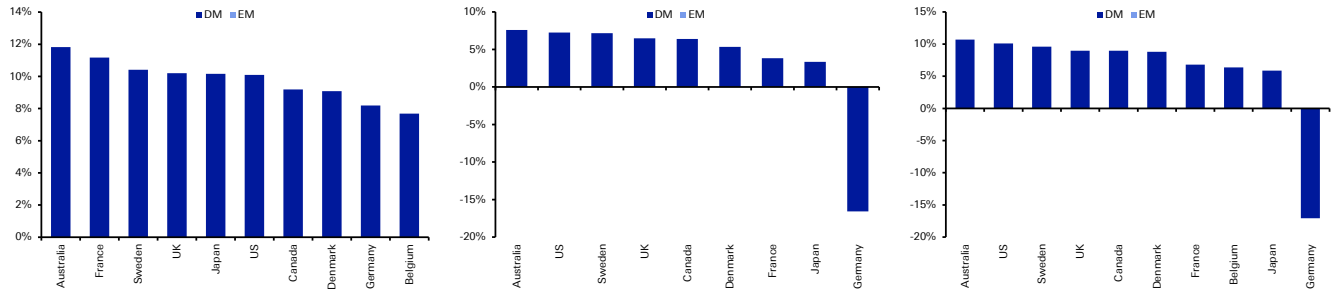
Source : Deutsche Bank, GFD

Figure 112: Last 50 years annualised equity returns - nominal (left), real (middle), USD (right)



Source : Deutsche Bank, GFD

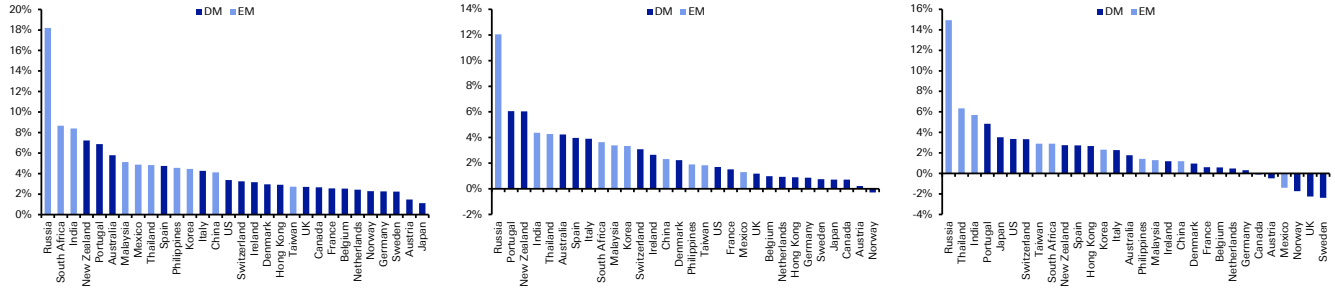
Figure 113: Last 100 years annualised equity returns - nominal (left), real (middle), USD (right)



Source : Deutsche Bank, GFD

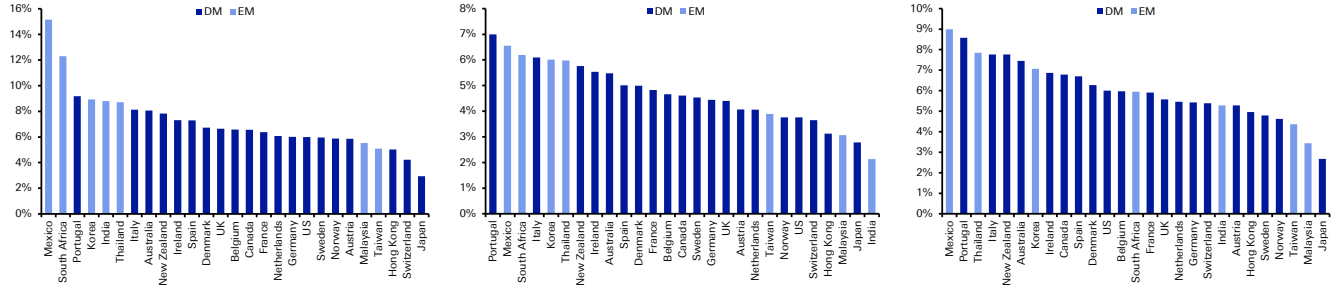
International 10 year government bond return charts

Figure 114: Last 5 years annualised bond returns - nominal (left), real (middle), USD (right)



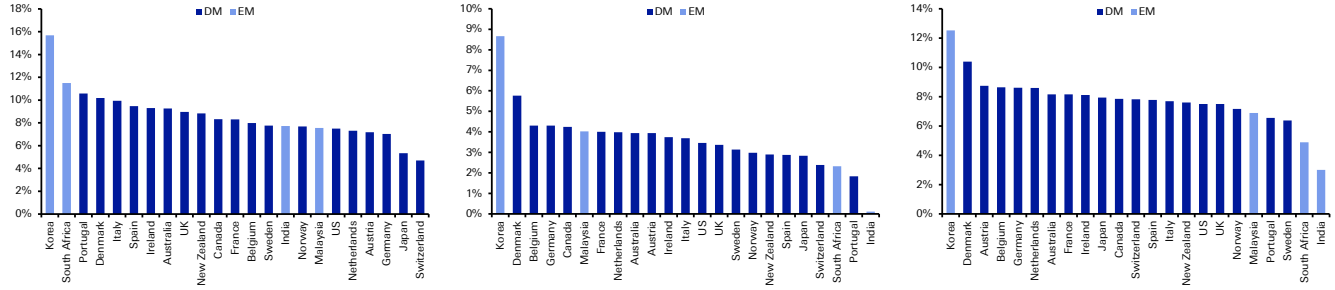
Source :Deutsche Bank, GFD

Figure 115: Last 25 years annualised bond returns - nominal (left), real (middle), USD (right)



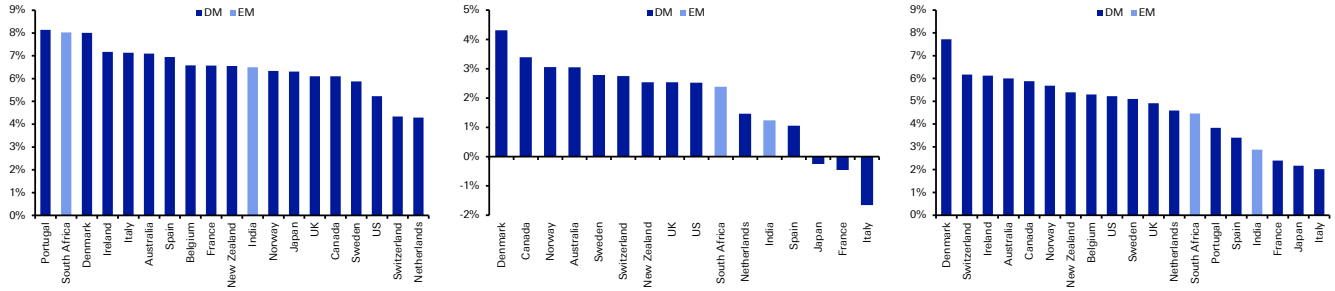
Source :Deutsche Bank, GFD

Figure 116: Last 50 years annualised bond returns - nominal (left), real (middle), USD (right)



Source :Deutsche Bank, GFD

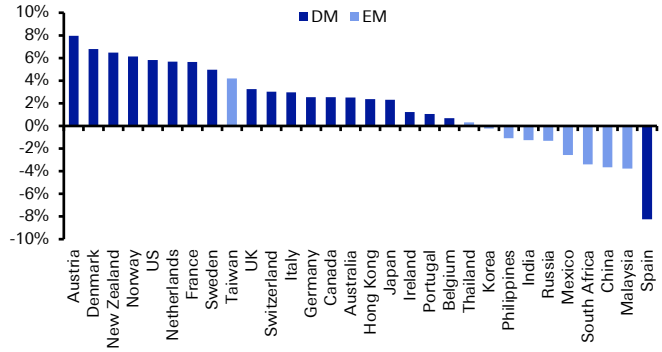
Figure 117: Last 100 years annualised bond returns - nominal (left), real (middle), USD (right)



Source :Deutsche Bank, GFD

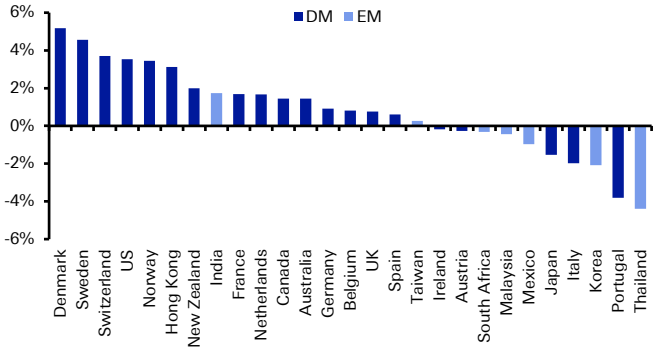
International equity minus bond returns

Figure 118: Last 5 years annualised equity-bond return



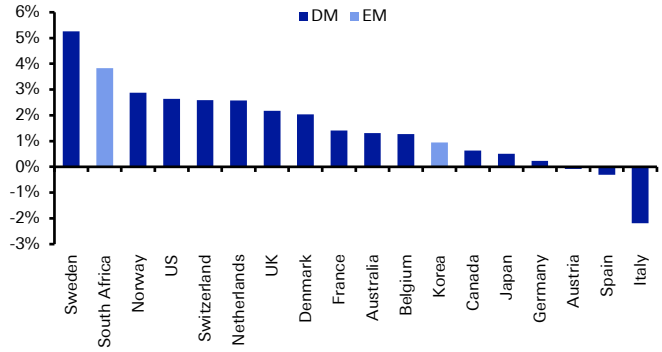
Source : Deutsche Bank, GFD

Figure 119: Last 25 years annualised equity-bond return



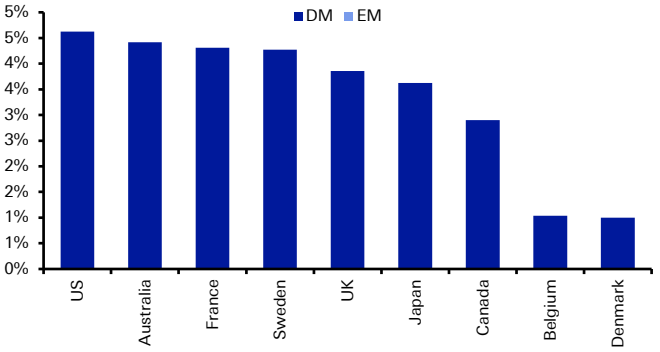
Source : Deutsche Bank, GFD

Figure 120: Last 50 years annualised equity-bond return



Source : Deutsche Bank, GFD

Figure 121: Last 100 years annualised equity-bond return



Source : Deutsche Bank, GFD

Appendix 1

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