

The debt of nations

A POLICY INSIGHT



Foreword

'It is vital to regain control of our public debt in order to be able to cope with a future increase in interest rates.'

Francois Villeroy de Galhau
Governor, Bank of France, 1 July 2017

Over the past century, many governments have become increasingly dependent on borrowing to finance public spending. In the last decade there has been a dramatic increase in public debt, with governments around the world now owing almost £30tn to external investors.

Borrowing is an important tool for government. When used to finance public investment, for example in infrastructure, it can be beneficial. That investment is likely to contribute to greater growth in the economy and consequently greater tax revenues. However, public borrowing has frequently been used to finance day-to-day public spending where it exceeds the tax revenues raised by a government; so-called 'deficit spending'.

Where the rate of growth in that deficit spending exceeds the rate of growth in tax revenues it gives rise to questions about the sustainability of public finances. Over time there is a weakening in the financial position of the country concerned, making it far less resilient to future economic shocks.

Global public debt has tripled over the last decade since the 2008 financial crisis. Countries have only been able to sustain these levels of debt because monetary policy interventions such as quantitative easing have resulted in extremely low interest rates.

The era of ultra-low interest rates appears to be coming to an end. As the global economic recovery leads to lower unemployment and higher inflation, central banks are starting to increase interest rates and reverse programmes of quantitative easing. Both factors are likely to increase the cost of future borrowing.

With global public indebtedness at such high levels, this situation means considerable risk has been built up by governments. Economic growth should provide higher tax revenues, but without action the risks associated with public debt will grow further. History shows us that it's not a question of whether another economic shock will come, but rather when. Consequently, we believe it is time for greater scrutiny of the risks that have been built up in public balance sheets around the world.

We need a better public understanding of how that debt is managed and whether appropriate steps are being taken to build resilience into our public finances.

If we are to build a world of strong economies, it is in all of our interests that public debt is kept under control.

INSIGHT

A decade after the corporate debt crisis, public debt is at an all-time high and continues to rise. The potential for a global public debt crisis should not be ignored.



Michael Izza

Michael Izza
Chief Executive
ICAEW

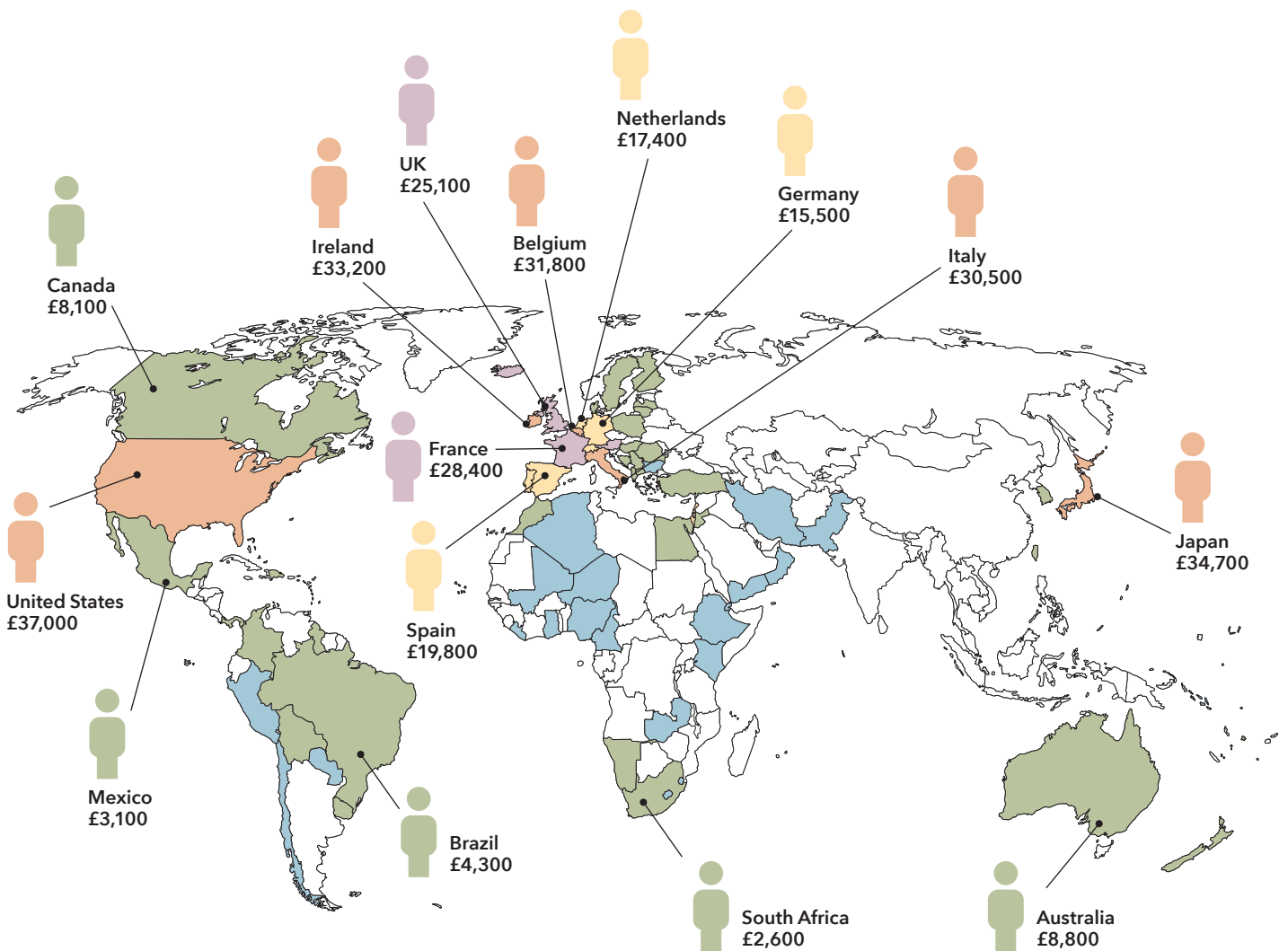
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Public debt by country

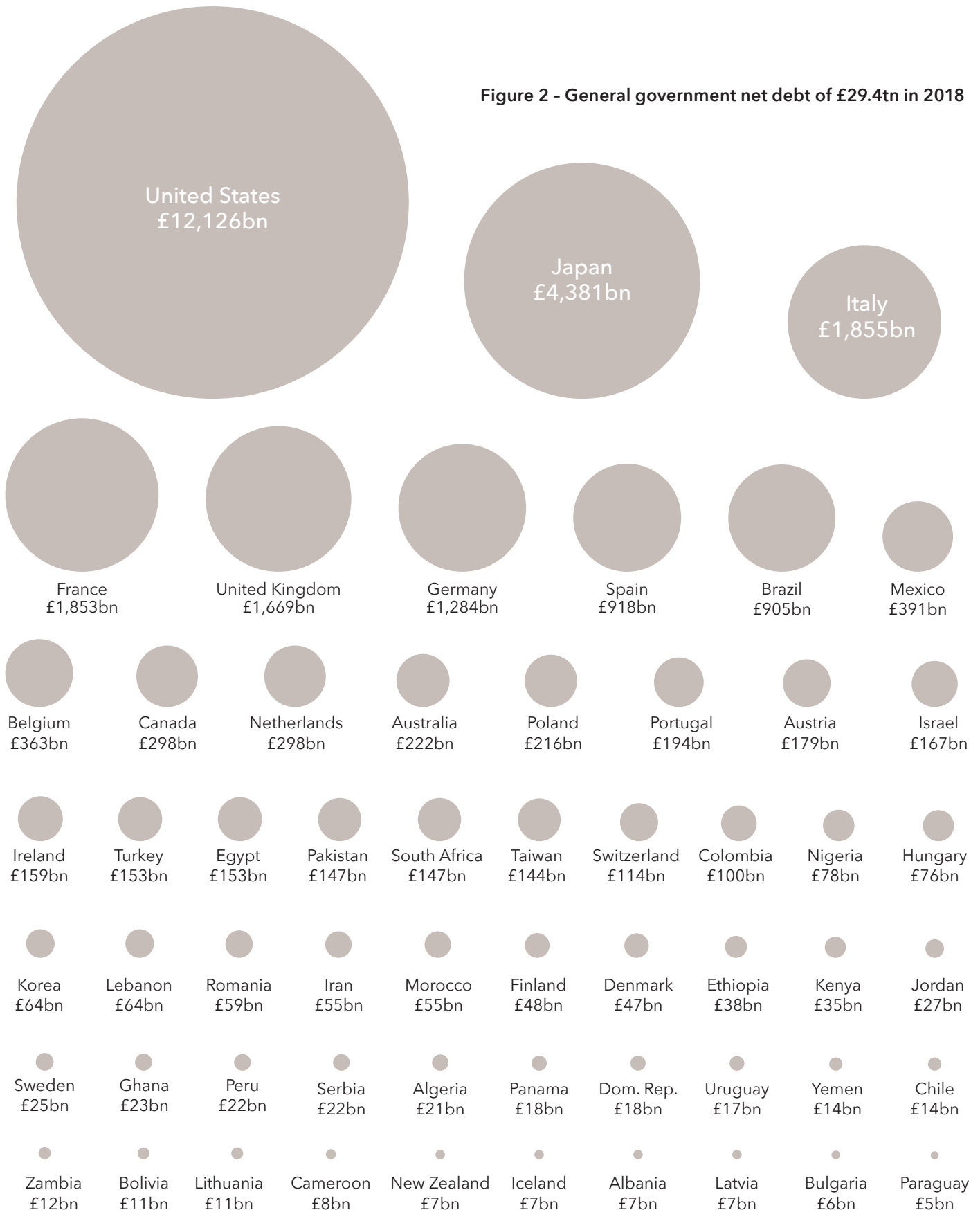
Figure 1 - General government net debt per capita by country

Net debt per capita (£)



Public debt by country

Figure 2 - General government net debt of £29.4tn in 2018



Source: IMF World Economic Outlook Database October 2017.

Executive summary

INTRODUCTION

Globally, public debt is expected to reach almost £30tn in 2018 and is continuing to increase.

In this policy insight we look at how public debt has been growing, the risks faced by indebted countries and whether public debt is sustainable at its current levels.

KEY FINDINGS

- **Public debt** for the 76 countries that report net debts **has more than tripled since 2001**, from £9.7tn to £29.7tn this year.
- **Just 12 countries owe 90%** of that public debt.
- Indebted governments expect to add more than £800bn to debt in 2018, although this is **likely to exceed £1tn** after taking account of recently-enacted tax cuts and greater spending planned in the US this year.

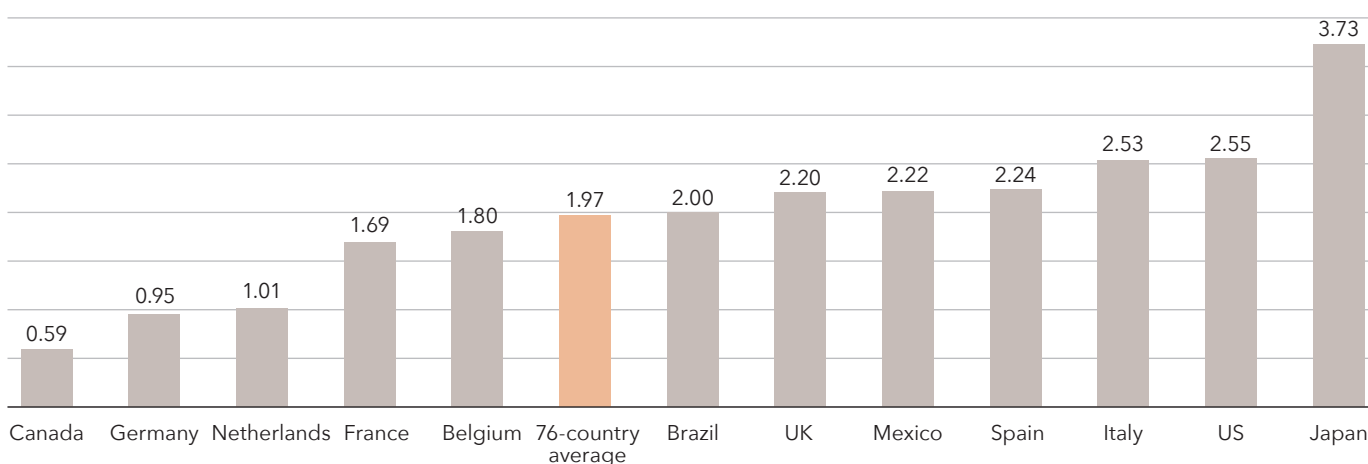
- Indebted countries owe an average of almost two years' government revenue, as illustrated in Figure 3.
- The **US is the most indebted country**, with £12.1tn in net debt, 2.55 times government revenue for 2018. **Japan is the second** most indebted country, with £4.4tn in net debt, 3.73 times revenue.
- Since 2001, the **UK has seen its public debt increase by an average of 9.9% a year**.
- Public debt is **not transparent**, with multiple different measures of indebtedness causing confusion and making it difficult to understand the true financial position of indebted nations.
- **Other liabilities and commitments can be even larger** than the amounts owed in debt, such as those for unfunded public employee pensions. Relatively few government provide transparent reports on their full liabilities.

INSIGHT

The 12 most indebted countries owe £26.3tn, 90% of the total owed by indebted countries.

Together they plan to borrow a further £1tn in 2018.

Figure 3 - Ratio of general government net debt to government revenue - 2018



Source: IMF World Economic Outlook Database October 2017; ICAEW calculations.

EXCHANGE RATES

We have used the following exchange rates in this policy insight:

GBP	£	1.00
	=	
USD	\$	1.35
EUR	€	1.13
CNY	元	8.78
JPY	¥	152
BRL	R\$	4.47
MXN	Mex\$	26.6
INR	₹	86.2
CAD	C\$	1.70
AUD	A\$	1.73

KEY FINDINGS (CONTINUED)

- **Most public debt will be perpetual** with almost all governments issuing new debt to fund the repayment of existing debt. The 12 most indebted countries need to **refinance £2.6tn in 2018**.
- Indebted countries are exposed to changes in interest rates, with **the cost of borrowing likely to rise** over the next few years.
- Exposure to rising interest rates has been **exacerbated by quantitative easing**, which has swapped long-term fixed-rate bonds for variable-rate central bank deposits.
- Despite the scale of public debt and exposure to interest rates, many indebted countries have investment grade credit ratings, implying that **lenders are still confident there is a high probability they will be repaid**.
- In extremis, where countries lose the confidence of investors they can **print money**. In practice, doing so to fund public spending usually means a country is in serious trouble.
- Traditionally countries have used a strategy of **'inflating away' their debts** to manage excessive debts in their own currency. This strategy is, however, at the expense of their own citizens who suffer a loss in the value of the assets they own in their domestic currency.
- Some governments have **hedged against low inflation** by issuing inflation-linked debt. This has reduced their borrowing costs in recent years, but the corollary is that such countries will **pay out more if inflation increases**.

CONCLUSION

Many economists seem sanguine about public debt. After all, public debt may be a liability on a government's balance sheet, but it is an asset in the hands of investors. And in theory, investors can be taxed on the returns they receive from owning debt.

Governments also appear relatively comfortable about public debt levels. Historically low interest rates have reduced the cost of servicing debt substantially. In some cases, such as **Japan, negative real interest rates mean investors pay the government** for the privilege of investing their money in government securities.

But.

The era of ultra-low interest rates and low inflation appears to be coming to an end, with higher costs to borrowing as a result, while the consequences of unwinding quantitative easing remain unclear.

There are two key risks facing governments:

- if the cost of debt rises faster than growth in the government revenues available to service it, pressures on public spending will increase, in turn **raising questions about sustainability**; and
- over-indebted governments that rely on borrowing to support public spending **could experience an economic shock** that restricts their ability to borrow.

In the developed countries which are the biggest borrowers, the public finances are already under pressure due to a combination of immediate demands for spending combined with the changing demographic from increasingly long-lived populations.

The eventual impact of artificial intelligence and automation on employment and in turn on taxation is another unknown. Even in the absence of an economic shock, these factors would suggest a prudent approach to public debt management is going to be needed to maintain the confidence of investors.

Even in government, little focus is given to the state of public balance sheets and how debt is managed. Given the importance of public debt to the economy this subject needs more scrutiny: there needs to be more **public debate about public debt.**

RECOMMENDATIONS

Greater transparency and scrutiny

Current measures for government debt do not provide an adequate picture of the financial position of governments.

We recommend that governments adopt a standardised approach of reporting and forecasting their revenues, public debt and other financial liabilities in accordance with international accounting standards, supported by the IMF, OECD and credit rating agencies. Governments should be able to provide a much clearer picture than they do today of their funding requirements and the capacity of their economies to service their debts.

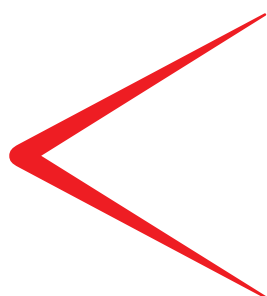
In addition, national parliaments need to do more on behalf of their citizens to scrutinise the levels of public debt, treasury strategy and the operation of debt management agencies.

Regular country-level stress tests

We recommend that governments carry out regular stress tests on their public finances and publish the results.

Only by examining a realistic range of economic scenarios can countries assess the potential impact of an economic downturn on their public finances.

There is a role for international bodies such as the IMF and the UN to develop and promote standard toolkits to support governments in carrying out country-level stress tests.



ICAEW believes that governments need to demonstrate that they have public debt under control.

Borrowing is easy ... until it isn't

INSIGHT

Many governments rely on external finance to provide the funds they need.

But how much debt is too much? There does not appear to be a clear indicator to tell us when investors might lose confidence and withdraw funding.

Many governments rely on external investors to provide them with the funding they need.

Cash to pay for spending not covered by taxes or other income, cash to invest in infrastructure and other assets, cash to lend to students and business, and cash to settle previously-incurred liabilities, including repaying existing debts as they fall due.

The good news for most countries needing money is that borrowing is easy.

The bad news for most countries needing money is that borrowing is easy.

Investors typically lend money by investing in government securities, even in countries with very large deficits and high levels of indebtedness such as the UK, or in countries with struggling economies such as Greece.

INSIGHT

Printing money to pay for spending sounds attractive, but the experience of countries such as Zimbabwe illustrate the pitfalls of such an approach.

Government securities are perceived to be so secure that they are sometimes described as 'risk-free', a safe haven that provides investors with a lower risk alternative to depositing money in commercial banks or in lending or investing in business ventures. This can allow governments to borrow at much lower interest rates than might appear justified given their reported level of debt.

In addition, sovereign countries with their own currencies have an additional backup 'line of credit' in the form of their ability to print money. In theory, this enables governments to continue spending more on public services than is collected in taxes and other income, even if external investors are not willing to provide the finance needed.

Irrespective of whether an indebted country needs to borrow to fund public spending, it will still need to repay existing debts as they fall due. Such repayments are in most cases financed by issuing replacement debt, requiring external investors to continue to have confidence in the public finances of the countries concerned.

Countries may be able to respond to weakening confidence by increasing the interest rate they are prepared to pay, increasing the burden that debt places on a nation's public finances.

Eventually a country may not be able to continue to service its debts and so default.

As there is no international equivalent of a Chapter 9 or Chapter 11 process, a sovereign default affects more than just government institutions. The experience of Argentina in 2001 shows that an entire economy can be affected when the central bank is cut out of the international financial system. The economy contracted by 11% and unemployment rose to 22.5%.

The more recent experiences of Greece in 2008-09 also show the economic impact of a loss of confidence by investors in a country's ability to service its debt. The result was a five-year recession with a 26% fall in the economy between 2008 and 2014.

Even where governments in financial difficulty are rescued by the IMF or are able to restructure their debts with the agreement of their creditors, there can still be significant adverse consequences for citizens and domestic businesses. This can include austerity measures to cut public spending and higher taxes to raise money to service debt and interest payments.

The growth in public debt

The IMF World Economic Database contains economic and fiscal data on 193 countries around the world, including information about their public debts.

In 2018, 76 countries are expected to be indebted, owing an estimated net amount of £29.4tn to external investors.

Figure 4 shows how general government net debt for indebted countries has increased by more than threefold since 2001, from £9.7tn to £29.4tn.

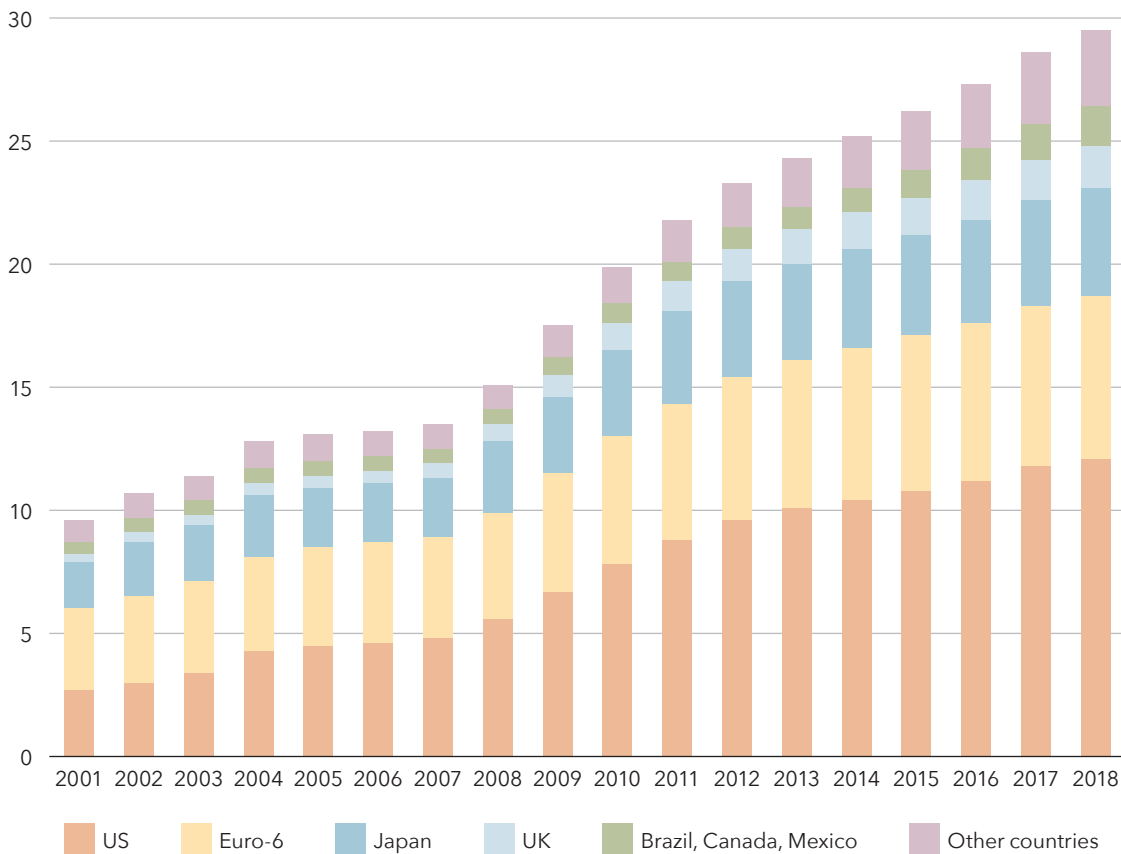
This is an increase of over £1tn a year.

This explosion in public debt has been led by the major developed countries, in particular the US, Japan and the UK.

INSIGHT

Public debt has tripled since 2001, with the US and Japan borrowing the most.

Figure 4 - General government net debt from 2001 to 2018 (£tn)



General government net debt for the 76 indebted countries in 2018. Euro-6 = Italy, France, Germany, Spain, Belgium and the Netherlands. Source: IMF World Economic Outlook Database October 2017; all years converted at 31 December 2017 exchange rates.

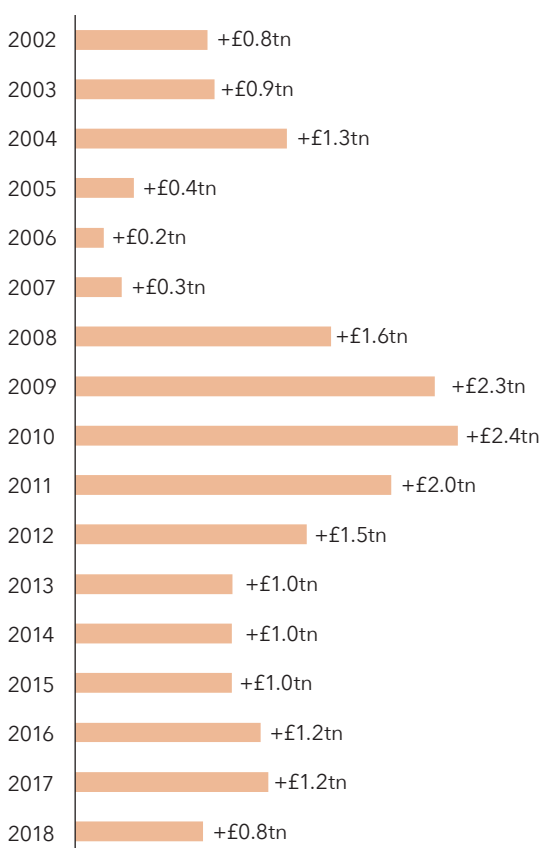
INSIGHT

The UK has seen its general government net debt grow by 9.9% a year since 2001.

Figure 5 summarises how general government net debt has increased in each year since 2001. Debt increased even in the boom years before the financial crisis, with significant increases subsequently.

This year's increase in public debt was expected by the IMF to be £0.8tn, below the average increase over the last 17 years. However, this is before reflecting the effect of tax cuts and higher spending plans announced by the federal government of the US and so the actual increase is likely to be nearer to £1tn.

Figure 5 - Change in net debt by year



Source: IMF World Economic Outlook Database October 2017.

Table 1 highlights how the 12 most indebted countries have increased the amount they owe significantly over the last 17 years. This has been led by the US and Japan, who together have borrowed £11.9tn in that time.

Table 1 - Change in net debt 2001 to 2018

General government	Net debt 2001 £bn	Net change £bn	Net debt 2018 £bn	Average change per year %
US	2,657	9,469	12,126	+9.3%
Japan	1,904	2,477	4,381	+5.0%
Italy	1,113	742	1,855	+3.1%
France	677	1,176	1,853	+6.1%
UK	337	1,332	1,669	+9.9%
Germany	868	416	1,284	+2.3%
Spain	281	637	918	+7.2%
Brazil	151	754	905	+11.1%
Mexico	90	300	391	+9.0%
Belgium	231	132	363	+2.7%
Canada	278	20	298	+0.4%
Netherlands	162	136	298	+3.7%
12 countries	8,751	17,591	26,342	+6.7%
Other	906	2,147	3,053	+7.4%
76 countries¹	9,657	19,738	29,395	+6.8%

¹ Excludes net debt of countries in 2001 that are no longer indebted or for which there is no data in 2018.

Source: IMF World Outlook Economic Database October 2017.

It is not surprising that the US and Japan are the largest contributors to public debt growth in recent years as they are the first and third largest economies in the world and have a greater capacity to borrow. However, the scale of their borrowing is significant even taking that into account.

Of the major developed countries, the UK has seen its public debt grow at the highest rate, with an annualised rate of increase of 9.9% over the last 17 years.

The picture is more mixed once adjusted for the growth in government revenues, as shown in Figure 6. This illustrates how the ratio between general government net debt and government revenue has changed since 2001.

Of the 12 most indebted countries, the UK has the greatest growth in general government net debt in proportion to government revenues, with its ratio growing from 0.86 in 2001 to 2.20 times in 2018. This is a concern for the UK, as it is now more vulnerable to potential economic shocks.

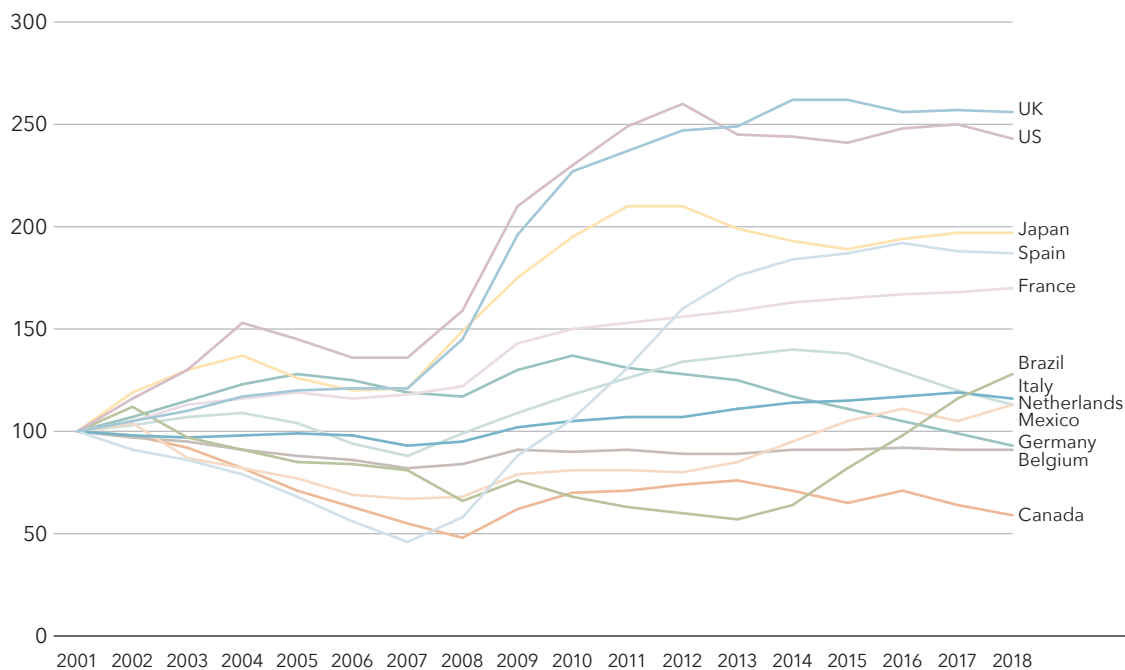
The US is only marginally better than the UK, with net debt up from 1.05 times government revenue to 2.55 times over the same period. However, this is before taking account of recently-enacted tax cuts and additional spending pledges, which are likely to increase the ratio further in 2018 from that shown here.

At the other end of the scale, Canada has seen its indebtedness rise more slowly than its government revenues, with its net debt reducing from 0.99 of a year's revenue in 2001 to 0.59 in 2018.

While some countries have been acting to reduce fiscal deficits to slow the rise in debt, others, such as the US, continue to borrow significant sums to fund the gap between government revenue and spending.

Is this sustainable?

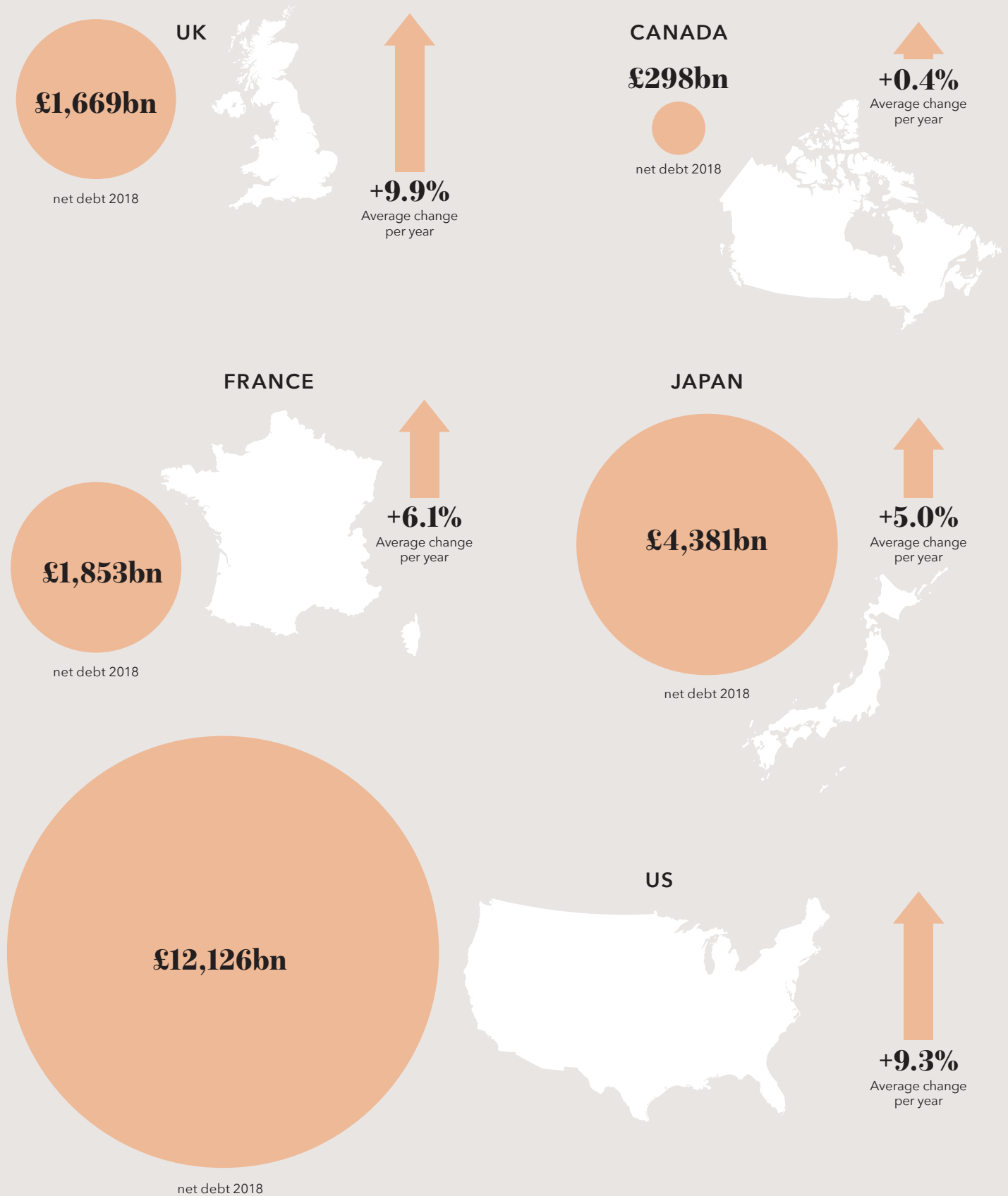
Figure 6 - Change in general government net debt to revenue ratio 2001 to 2018



General government net debt to government ratios in 2001 = 100.
Source: IMF World Economic Outlook Database October 2017.

Change in public debt 2001 to 2018

NET DEBT 2018 AND AVERAGE CHANGE PER YEAR



How much do nations owe?

Indebted countries are expected to owe a total of £42.0tn in 2018, before taking account of cash and other liquid financial assets of £12.6tn. Net debt is £29.4tn.

The 12 most indebted nations are expected to owe £26.3tn or around 90% of the total, as summarised in Table 2.

Table 2 - Forecast gross and net debt 2018

General government	Gross debt £bn	Cash and liquid assets £bn	Net debt £bn
US ¹	16,131	(4,005)	12,126
Japan	8,716	(4,335)	4,381
Italy	2,034	(179)	1,855
France	2,026	(173)	1,853
UK	1,857	(188)	1,669
Germany	1,837	(553)	1,284
Spain	1,043	(125)	918
Brazil	1,376	(471)	905
Mexico	462	(71)	391
Belgium	411	(48)	363
Canada	1,152	(854)	298
Netherlands	365	(67)	298
12 countries	37,410	(11,067)	26,342
Other	4,595	(1,543)	3,053
76 countries	42,005	(12,610)	29,395

¹ Does not reflect higher borrowing expected in 2018 following recent tax cuts and planned spending increases.

Source: IMF World Outlook Economic Database October 2017.

Cash and other liquid financial assets include cash available for operational reasons as well foreign currency reserves invested in the debt of other countries.

These balances tend to be higher in federal countries, where it is not uncommon for states or provinces to maintain positive cash balances, especially where they have legal or constitutional restrictions on borrowing.

The remaining 117 countries have gross debts of £9.9tn in total, but no net debt, implying that they each have cash and other liquid financial assets equal to or in excess of their gross debts.

In a few cases this may be due to incomplete data. For example, neither Greece (gross debt of £309bn) nor Argentina (gross debt of £260bn) are reported by the IMF as having net debt.

Very few non-indebted countries apart from Norway (where cash and other financial assets of £383bn significantly exceed gross debt of £103bn) report their net cash position to the IMF, so it is unclear how much countries such as China, India, Indonesia and Russia have in cash and liquid financial assets in excess of their gross debts.

Table 3 illustrates how much is owed by the other countries within the 20 largest economies in the world.

Table 3 - Other top 20 economies

General government	Rank	Gross debt £bn	Net debt £bn
China	2	5,095	-
India	5	1,456	-
Korea	11	483	64
Russia	12	222	-
Australia	13	460	222
Indonesia	16	235	-
Turkey	18	187	153
Saudi Arabia ¹	19	109	-
Switzerland	20	216	114

¹ The IMF reports Saudi Arabia as having net cash of £0.5bn.
Source: IMF World Outlook Economic Database October 2017.

The most effective and cheapest way to borrow money is to do so directly from lenders. As a consequence, the primary routes through which governments seek to raise funds are either by selling securities directly to institutional and other debt investors or by taking deposits directly from retail investors.

In most countries, state and local government bodies will also borrow directly from external investors. For example, many states in the US issue state or municipal bonds to fund infrastructure projects, such as investment in public transport.

Smaller countries may not have the scale to raise funds in this way, so syndicated loans arranged by international commercial banks are often used to provide the finance they need.

Most public debt is in the form of official certificates promising that investors will receive payments in the future. These are known as government securities and are generally unsecured, meaning that investors have limited recourse if a government decides not to pay.

Government securities can range from treasury bills repayable within a year through to notes or bonds that may be due for repayment from as little as two years after the date of issue up to 30 years or even longer.

Government securities are usually sold to banks and other institutional investors initially. They are then traded on open markets, allowing other investors to buy them.

Some countries also borrow directly from individual citizens by issuing bonds targeted at retail investors (eg, US Savings Bonds) or by establishing their own deposit-taking institutions, such as National Savings & Investments in the UK.

Public debt includes more than the 'national debt' owed by central or federal governments. Amounts owed to external investors by state, provincial and municipal authorities are also included.

As an example, Table 4 summarises the components of debt owed by public institutions in the UK to external investors.

Table 4 - UK public sector net debt

At 31 December 2017	£bn	/GDP
Government securities	1,153	56.0%
Bank of England deposits	565	27.4%
National Savings & Investments	153	7.4%
Local authorities' external debt	21	1.0%
Other debt	45	2.2%
Public sector gross debt ex banks¹	1,937	94.0%
Less: cash and financial assets	(178)	(8.6%)
Public sector net debt ex banks¹	1,759	85.4%

¹ Excluding banks, principally The Royal Bank of Scotland.
Sources: UK Office for National Statistics and the Bank of England.

The amounts shown in Table 4 don't include internal balances, such as the £69bn owed by local authorities to central government, principally for infrastructure loans via the UK Public Works Board.

A sizeable component of public debt in the UK relates to central bank deposits, which is a consequence of quantitative easing purchases of government securities by the Bank of England since the financial crisis. This is discussed in more detail on page 28.

Measuring public debt

In this policy insight we have used general government net debt as a measure of a country's indebtedness.

This is reported in countries' National Accounts, based on international statistical rules set out in the United Nations System of National Accounts 2008 and the related European National Accounts 2010. These rules specify the financial liabilities that should be included within gross debt, and the financial assets that can be deducted to arrive at net debt.

In practice, governments use a wide variety of numbers to report on their level of indebtedness. For a start, different definitions of what constitutes 'government' mean that there is a minimum of six different debt measures.

Gross and net versions of central government debt report on the debt obligations of a central or federal government alone. General government gross and net debt encompass state, provincial and local governments as well, while public sector gross and net debt, further incorporate the debts of central banks and of publicly-owned corporations.

The multiplicity of numbers for measuring the scale of public debt can cause confusion, especially as many governments use their own country-specific measures that differ from the international ones.

For example, the UK reports 12 different measures of indebtedness, as illustrated by Table 5.

Table 5 - Debt measures used by the UK

At 31 December 2017	Gross	Net
Central government debt	1,765	1,590
General government debt	1,786	1,588
Public sector debt	2,476	2,059
Public sector debt ex BoE	1,812	1,591
Public sector debt ex banks ¹	1,937	1,760
Public sector fin. liabilities ex banks	2,066	1,454

¹ The principal bank excluded is The Royal Bank of Scotland.
Source: UK Office for National Statistics.

The UK focuses on two of these measures.

Its primary metric is a non-standard measure described as 'public sector net debt excluding banks' (PSNDex). This includes debts owed by most public corporations and by the Bank of England, the UK's central bank, but excludes amounts owed by The Royal Bank of Scotland, a commercial bank nationalised during the financial crisis that is expected to be returned to the private sector in the near future. It also uses general government gross debt (sometimes described as 'Maastricht debt'), as this is the measure used by the EU in assessing compliance with fiscal rules.

Unfortunately, none of the various measures for public debt are ideal. Both central government and general government debt measures exclude central banks, a key element in the public finances of most countries. And while public sector net debt includes central banks, it can often distort the financial picture by including the debts of commercial businesses owned by governments, irrespective of whether those debts are guaranteed by government.

With countries adopting very different ways of calculating their financial positions, the plethora of different measures makes international comparisons more difficult than they might otherwise be.

INSIGHT

Multiple measures for public debt can cause confusion. But, whichever measure is used, the numbers are big!

INSIGHT

On average, general government net debt of indebted countries is around two years' total revenues.

One method of comparing public debt internationally is to do so on a per capita basis. This adjusts for the different population sizes of each country and provides an indication of how much is owed for each person living in each country. For example, the US is estimated to owe £37,000 per person, substantially more than the £25,100 owed by the average person living in the UK, as illustrated in Figure 7.

The advantage of this approach is that it helps convert the very large numbers for public debt into more understandable amounts. Its downside is that it fails to take account of economic conditions that, for example, mean that Canada's £8,100 of net debt per person is much more affordable to its citizens than Brazil's £4,300 per person.

Another common approach when analysing public debt is to compare it to the size of the economy: the ratio of debt to GDP. This allows debt to be understood in relation to the economy that supports it.

For the 76 indebted countries, general government gross debt was 97% of GDP and general government net debt was 68% of GDP on average.

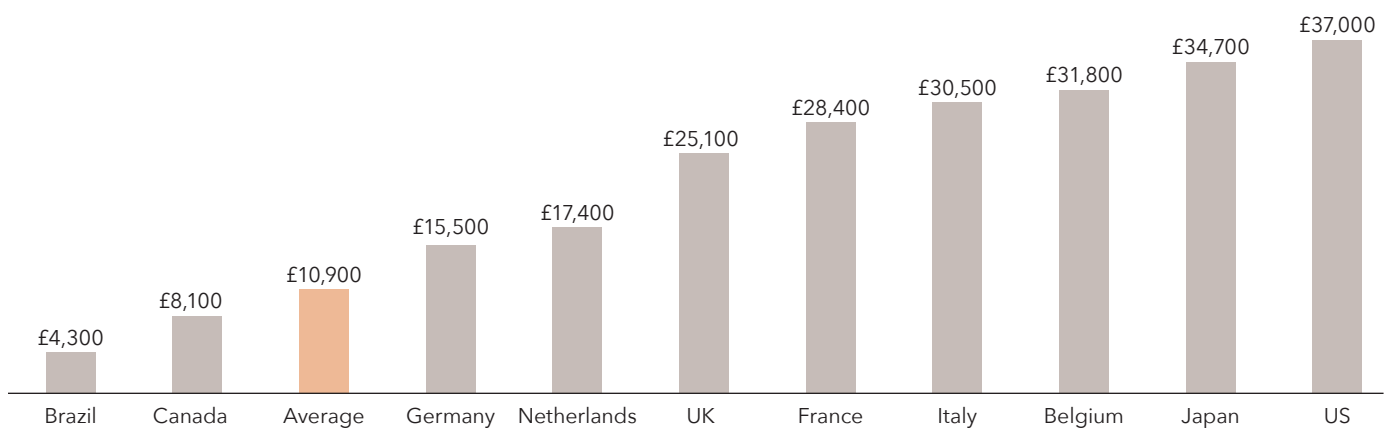
For the remaining 117 countries without net debt, general government gross debt to GDP was 48% on average.

Although dividing debt into GDP is a common way to assess the scale of public debt, as a measure it depends on the quality of statistical practices around the world. GDP is not always reliable, may be incomplete, and can be subject to manipulation.

GDP is also not available to governments as a source of income. A better approach is to calculate public debt in proportion of the revenue that governments actually receive and use to service their debts.

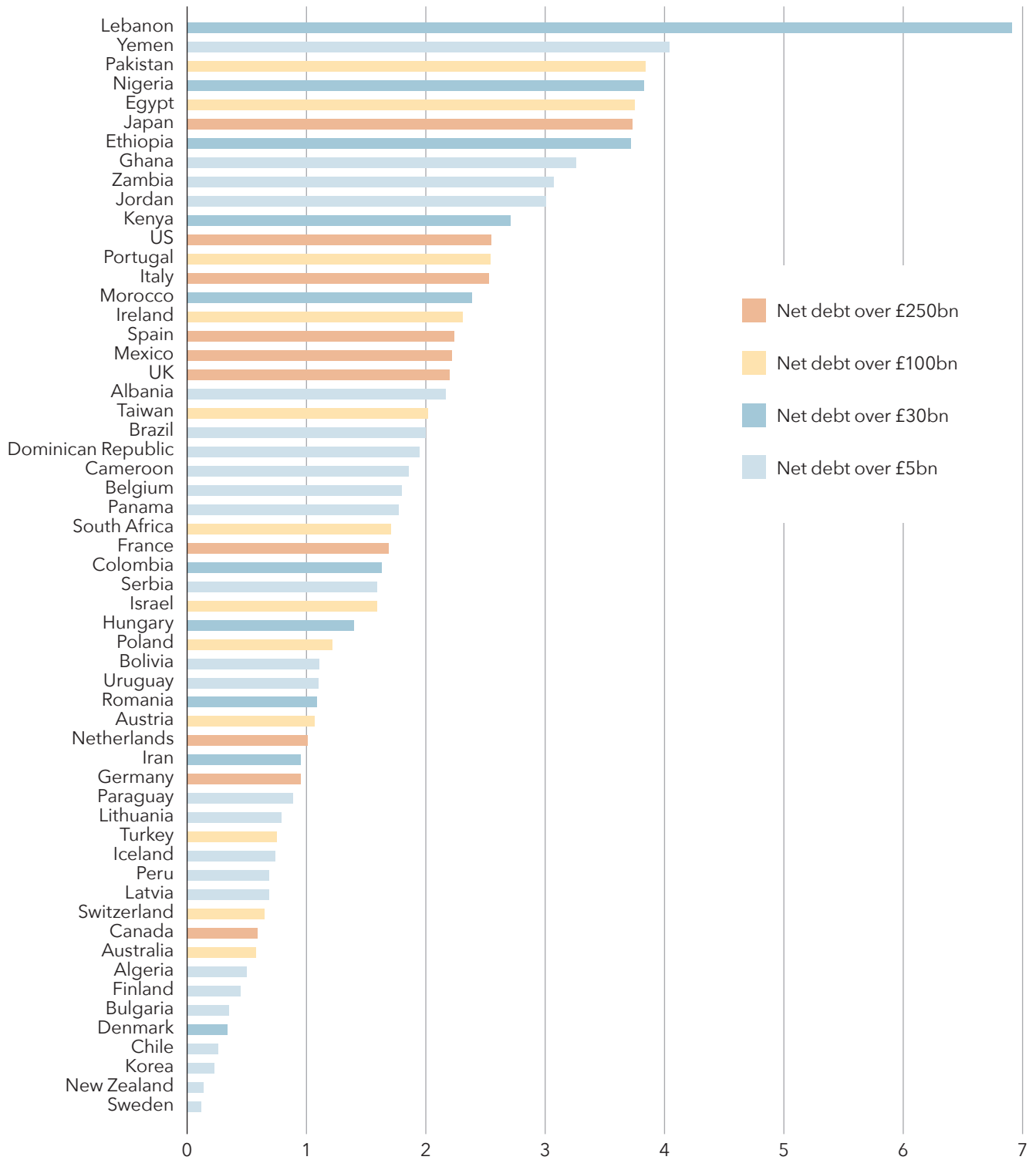
Figure 8 summarises these ratios for countries owing more than £5bn in 2018.

Figure 7 - General government net debt per capita in 2018 (£ per person)



Source: IMF World Economic Outlook Database October 2017.

Figure 8 - Ratio of general government net debt to government revenue - 2018



Source: IMF World Economic Outlook Database October 2017; ICAEW calculation

RECOMMENDATION

Current measures for government debt do not provide an adequate picture of the financial position of governments.

We recommend that governments adopt a standardised approach of reporting and forecasting their revenues, public debt and other financial liabilities in accordance with international accounting standards, supported by the IMF, OECD and credit rating agencies.

Governments should be able to provide a much clearer picture than they do today of their funding requirements and the capacity of their economies to service their debts.

In addition, national parliaments need to do more on behalf of their citizens to scrutinise the levels of public debt, treasury strategy and the operation of debt management agencies.

INSIGHT

Public debt is not the only liability on government balance sheets. Other liabilities and future commitments can be significantly larger.

At one extreme is Lebanon, which owes £64bn, some 6.91 times forecast annual government revenue of £9bn for 2018.

In contrast, Sweden owes £25bn, only 0.12 times its forecast government revenue of £211bn.

Of the countries with the highest ratios, these are either legacies of borrowing during more prosperous times, such as Lebanon and Yemen, or countries heavily dependent on foreign support, such as Egypt and Pakistan.

The outliers appear to be Nigeria, which seems excessively indebted given its natural resources, and Japan, which remains a very prosperous nation despite its very high level of debt.

Table 6 summarises both debt to GDP and debt to revenue ratios for the 12 most indebted countries.

Table 6 - Forecast debt ratios in 2018

General government	Net debt £bn	Net debt /GDP %	Net debt /revenue (times)
US ¹	12,126	81%	2.55
Japan	4,381	121%	3.73
Italy	1,855	120%	2.53
France	1,853	89%	1.69
UK	1,669	81%	2.20
Germany	1,284	43%	0.95
Spain	918	86%	2.24
Brazil	905	58%	2.00
Mexico	391	44%	2.22
Belgium	363	91%	1.80
Canada	298	23%	0.59
Netherlands	298	44%	1.01

¹ Does not reflect higher borrowing expected after tax cuts and spending increases announced in early 2018.
Source: IMF World Outlook Economic Database October 2017.

The use of net debt to revenue as a ratio implicitly adjusts for differences in tax systems. For example, France's net debt to GDP ratio of 89% is greater than the UK's 81%, but it has a significantly lower net debt to revenue ratio (1.69 times compared with 2.20). This reflects the relatively higher level of taxes levied as a proportion of the economy in France compared with the UK.

In any case, debt alone does not provide a comprehensive picture of the amounts owed by most countries, irrespective of the measure used.

This is not just because of 'off balance sheet debt', such as public-private partnership arrangements in the UK that have been structured specifically to avoid being classified as debt. It is instead because most countries have sizeable non-debt liabilities.

For example, the UK owes in the order of £1.5tn to current and former public employees for their pension entitlements and has other liabilities reported in its Whole of Government Accounts of £0.4tn.

Debt also excludes the commitments that many countries have to pay for social security benefits in the future, in particular for the pensions and medical costs of retirees. The majority of governments have not attempted to quantify these obligations, but in the UK some estimates have been made by others that these could be in the order of between £3tn-£7tn.

Of course, none of these measures take account of the ability of governments to raise taxes and the capacity of an economy to be taxed. Our understanding of the financial sustainability of governments would be vastly improved if they were to publish both accurate and comprehensive reports of their liabilities and of their projected revenues.

Selling government securities

Governments principally borrow money by selling official certificates, known as government securities. These typically entitle the holder to receive a principal amount (the 'face' or 'nominal' value) at a future date, together with interest payments (known as a 'coupon') at six-monthly intervals over their term.

For example, a £100 10-year government security with a coupon of 2% would entitle an investor to receive £1 every six months for 10 years and £100 on maturity. If 10,000 of these securities were sold at a price of £95 per security, then the amount raised would be £950,000 at an effective interest rate of 2.59%.

Because of their short-term nature, securities issued for less than a year do not pay a coupon. The cost of borrowing arises solely from the difference between how much they are sold for and their face value. For example, an investor might earn an annualised yield of 0.5% by purchasing £100 six-month treasury bills for £99.75 each, providing a return of 25p for each bill.

Government securities are usually reported at their nominal value under the non-standard accounting rules used by governments. This is based on how much they expect to repay on maturity, rather than how much they originally borrowed. The first example above would be reported as £1m of debt, even though only £950,000 was borrowed. This contrasts with accounting standards in the corporate world, where the £50,000 difference would be recorded as part of interest charge over the term of the debt.

Countries use a variety of descriptions for their government securities, as summarised in Table 7.

Table 7 - Names of government securities

Country	Security	Length
US	T-bills	<1 year
	US treasury notes	2-10 years
	US treasury bonds	10+ years
Japan	Treasury discount bills	<1 year
	Government bonds (JGBs)	2+ years
France	Treasury bills (BTFs)	<1 year
	Treasury bonds (OATs)	2+ years
UK	Treasury bills	<1 year
	Short-term gilts	2-7 years
	Medium-term gilts	8-15 years
	Long-term gilts	15+ years
Germany	Bubils	<1 year
	Schaetze	2 years
	Bobls	5 years
	Bunds	10+ years
Spain	Letras del Tesoro	<1 year
	Bonas del Estado	2-5 years
	Obligaciones del Estado	7+ years
Netherlands	Treasury certificates	<1 year
	State loans	2+ years

Sources: National debt management agencies.

Government securities longer than a year are typically issued with fixed coupons, although a number of governments also issue inflation-linked bonds, where coupon payments and the amount payable on maturity increase in line with an inflation index. Other varieties include securities issued in foreign currency, such as Canada's US dollar-denominated Canada Notes, and variable-interest bonds, such as the Floating Rate Notes issued by the US federal government.

Boxes 1 and 2 provide more detail on UK and US government securities.

Box 1 – UK government securities

Treasury bills are usually issued for periods of one, three or six months. They do not pay any coupons; investors in effect receive interest in the form of the difference between the discounted price at which they are issued and the repayment on maturity.

An example is a six-month Treasury bill issued in January 2018 and due to mature on 17 July 2018. £100 Treasury bills were issued at an average discounted price of £99.91, providing a yield to investors equivalent to an annual rate of interest of 0.18%.

Conventional fixed-interest gilts are bonds issued for a variety of periods in excess of a year: short-term if they are due to be repaid within seven years of the date of issue, medium-term between seven and 15 years, and long-term if longer than 15 years. They pay interest (known as a coupon) twice a year until they mature, when the principal amount is repaid.

An example of a long-term fixed-interest gilt is the **1.75% Treasury Gilt 2037** issued by the DMO on 10 October 2017. Investors bought these in units of £100, entitling them to coupon payments of 87.5p twice a year over the next 20 years, followed by a final payment of £100 in 2037. These gilts were sold at an average price of £96.86, equivalent to an effective annual interest rate of 1.94% on the funds raised.

Index-linked gilts are generally issued in medium- or long-term lengths and also pay a fixed coupon twice a year between their issue and their maturity date. The principal payable when they mature is not fixed and is instead linked to the change in the Retail Prices Index (UK RPI) over that time.

An example of an index-linked gilt is the **0.625% Index-Linked Treasury Gilt 2042** issued by the DMO on 24 October 2017. Each £100 gilt pays a coupon of 31.25p twice a year over its 25-year term, followed by a payment of principal equal to £100 uplifted by the increase in the UK RPI between 2015 and 2042. These gilts were sold at an average price of £166.91, equivalent to a real interest rate of -1.55%.

Bank of England deposits are another form of public finance on which interest is paid at the Bank of England base rate. These have been an extremely cheap form of financing recently since rates have been either 0.50% or 0.25% since 2009.

At 31 December 2017, the net amount owed to external parties by the Bank of England was £554bn. This has increased significantly since the financial crisis as a consequence of quantitative easing, as described in Box 6 on page 29.

Box 2 – US government securities

T-bills are usually issued for periods of 4, 13, 26 or 52 weeks. They do not pay any coupons; investors in effect receive interest in the form of the difference between the discounted price at which they are issued and the repayment on maturity.

An example is the 13-week T-bill issued in October 2017 that matured on 4 January 2018. \$100 of these T-bills were issued at an average discounted price of \$99.73, providing a yield to investors equivalent to an annual rate of interest of 1.11%.

Treasury Notes are fixed-interest bonds issued for periods of 2, 3, 5, 7 or 10 years, while **Treasury Bonds** are fixed-interest rate bonds issued for periods greater than 10 years. They pay interest (known as a coupon) twice a year until they mature, when the principal amount is repaid.

An example of a Treasury Note is the **2¼% 10-year Treasury Note F-2027** issued by the Department of the Treasury on 15 November 2017. Units of \$100 are entitled to coupon payments of \$1.125 twice a year over the next 10 years, followed by a final payment of \$100 in 2027. The notes were sold at an average price of \$99.43, equivalent to an effective annual interest rate of 2.31% on the funds raised.

Treasury Inflation Protected Securities (TIPS) are generally issued for periods of 5, 10 or 30 years and also pay a fixed coupon twice a year between their issue and their maturity date. The principal payable when they mature is not fixed and is instead linked to the change in the US consumer price inflation index (US CPI) over that time.

An example of a TIPS is the **0.875% 30-year TIPS of February 2047** issued by the Department of the Treasury in February 2017. Each \$100 TIPS pays a coupon of \$4.375 twice a year over its 30-year term, followed by a payment of principal equal to \$100 uplifted by the increase in the US CPI between 2017 and 2047. 63% of these units were sold at a price of \$98.76, equivalent to a real interest rate of 0.92%.

Federal Reserve deposits are another form of public finance on which interest is paid, either at the rate on required reserves (IORR) or at the rate on excess reserves (IOER). These were both 0.25% between December 2008 and December 2015, but they have increased since then to reach 1.75% in March 2018.

At 31 December 2017, total reserve balances maintained with Federal Reserve Banks were \$2.2tn. This compares with \$10bn of reserve balances in 2008 before quantitative easing (see Box 6 on page 29).

Government securities are generally sold at regular public auctions, with institutional investors bidding to buy treasury bills or government bonds.

This is explained in more detail in Box 3, which describes auctions in the UK.

Box 3 - UK gilt auctions and syndications

The UK Debt Management Office primarily raises funds through public **auctions** at which market participants bid to buy gilts. There are around 30-50 of these held each year, subject to market demand.

For example, on 18 January 2018 the Debt Management Office sold £2.5bn of 0¾% Treasury Gilt 2023. These are five-year gilts with a fixed coupon of 0.75%; paying a total of £18.75m each year in interest.

Bids were received for £5.2bn in gilts, meaning the auction was more than twice subscribed. Only bids within a certain range were accepted, with an average price of £98.699 for each £100 gilt, providing total funds to the exchequer of £2,467m. This price was a discount of £33m to face value. The initial yield to investors and the effective interest rate payable by the government was 0.993%.

Market yields will change over time and so the value of these gilts in secondary markets will rise or fall. However, the government is not exposed to these subsequent changes as the amounts it will pay out are fixed at the date of issue or, in the case of index-linked gilts, linked to changes in the RPI.

As an alternative to public auctions, the DMO sometimes chooses to raise funds through a **syndication** process. This is a negotiated process where a lead investor agrees terms with the DMO, which are then accepted by a wider group of investors.

Syndications allow the DMO to access a different group of investors from those who normally participate in gilt auctions, while allowing syndicates to create more tailored investment packages – for example, by combining gilts issued by the government with other investment products.

One of the key attractions of investing in government securities is that they are easily tradeable.

While some investors may choose to hold government securities until maturity, many will sell them before then. This may be at a profit if interest rates fall, or at a loss if interest rates increase.

These gains or losses may be helpful to investors, as they can be used to provide a hedge against movements in interest rates or increases due to inflation. For example, in the UK many pension funds invest in index-linked gilts in order to offset increases in pension obligations that are linked to inflation.

Government debt management agencies are active participants in secondary debt markets, as they want sovereign debt markets to be liquid, enabling investors to be confident they can always buy and sell whenever they need to – and therefore more willing to invest in government securities in the first place. As a consequence, governments routinely buy and sell their own securities on a regular basis.

Box 4 - Yields and valuations

The value of government securities to an investor can change over time as market interest rates change.

This is because the cash flows due under a government security are generally fixed. If interest rates reduce, then this means that investors will value the cash flows more than before and so values will increase. Conversely, higher interest rates imply lower prices for government securities as the fixed cash flows will be worth less to investors.

This inverse relationship between the value of a government security and its yield means that investors can lose money if they buy a government security and interest rates subsequently increase.

INSIGHT

Liquid sovereign debt markets are important to being able to raise funds.

INSIGHT

Despite high levels of public debt, market sentiment is generally positive.

For most organisations wanting to borrow money, an important factor is their credit rating. These are assessments provided by independent private sector agencies on the risks associated with investing in debt.

Out of the 12 most indebted economies, 11 have investment grade credit ratings. This is important as these countries depend on the willingness of investors to provide the funds they need, both to fund public spending and to refinance existing debts when they fall due for repayment.

Table 8 - Credit risk by country

16 March 2018	Average credit rating ¹		CDS default risk ²
Germany	1	AAA	0.8%
Netherlands	1	AAA	0.9%
Canada	1	AAA	2.3%
US	1¼	AAA	1.6%
UK	2½	AA	1.4%
France	2¾	AA	1.4%
Belgium	3¼	AA	1.3%
Japan	5½	A+/A	1.1%
Mexico	7¾	BBB+	14.8%
Italy	8¾	BBB	8.4%
Brazil	12¾	BB-	12.6%
China	5	A+	4.8%
India	10½	BBB-/BBB	7.7%
Argentina	14¾	B	22.3%
Greece	15¾	B-	27.3%
Venezuela	23	SD	100%

1 Credit ratings 1-10 (AAA to BBB-) are investment grade; 11-21 (BB+ to C) are below investment grade or speculative; 22-24 (RD-D) are in default.

2 Implied probability of default over five years, based on 40% recovery.

Sources (credit ratings): Standard & Poors, Moody's, Fitch and DBRS. Sources: (CDS) CNBC, Bourserama; ICAEW calculations.

For corporate debt issuers, credit ratings are a very important factor in determining the cost of their borrowing. For governments this rule doesn't always apply, as other factors come into play. A number of countries have even seen their interest costs fall after a downgrade by the major credit rating agencies, contrary to what might normally be expected.

Despite that, credit ratings are still very important to most governments. Many investors will not invest, or will restrict investment, in securities below certain credit ratings and a credit rating downgrade could reduce the pool of investors available.

Credit rating agencies generally rate debt issuers on a 24-point scale, from D (in default) up to AAA (prime) depending on their assessment of the credit risks to debt investors in lending money to the organisations concerned. The top 10 ratings from BBB- to AAA are described as 'investment grade', while the top four from AA- to AAA are described as 'high investment grade', with AAA being 'prime'.

Another way of assessing market sentiment towards public debt is to look at credit default swaps (CDSs), which are one of the most widely used forms of credit derivatives.

CDSs pay out in the event of a negative credit event or default, such as a failure to repay debt on time or where less is paid back than the full amount due. For a premium, they 'swap' the interest and principal payments due for equivalent payments from the CDS issuer.

For debt investors, credit default swaps can provide an insurance policy, protecting them from the risk that they may not receive all of the payments that they are due. Prices for CDSs can be converted into a rough estimate of the implied probability of default, giving an indication of how debt investors perceive the risk of investing in different countries. Some recent estimates are included in Table 8.

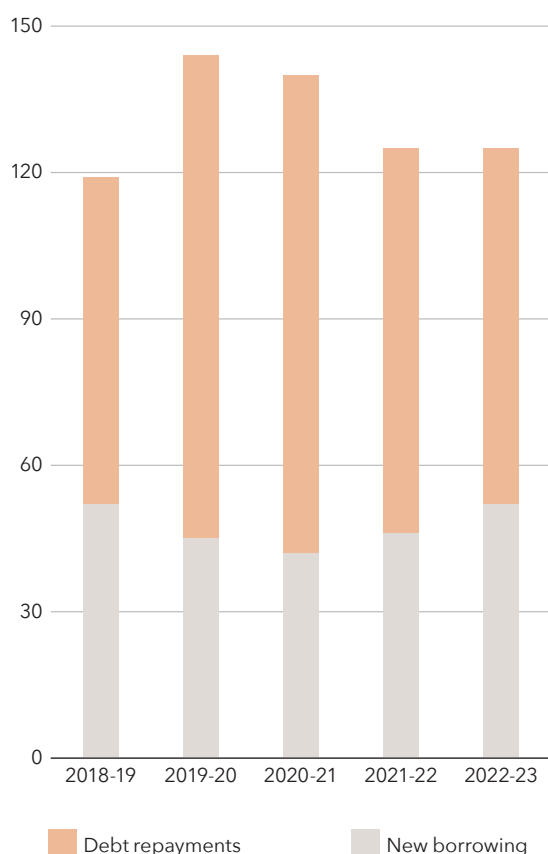
Maturity and refinancing

The need to borrow is driven both by the need to provide funding for government operations, but also the need to fund repayments of existing debt.

The latter can be greater than the former.

For example, the UK plans to raise £652bn over the next five financial years, of which £415bn is needed to fund debt repayments. This is illustrated by Figure 9.

Figure 9 - UK borrowing plan to 2022-23 (£bn)



Source: UK Office for Budget Responsibility *Economic and Fiscal Outlook March 2018*; HM Treasury *Debt Management Report March 2018*.

Many investors will reinvest the cash they receive when a government security matures. However, this is a matter of choice, and governments can't rely on investors continuing to do so if market conditions change.

Even if investors do decide to reinvest, any new government securities issued will be based on market conditions at the time, potentially with a higher cost of borrowing.

Governments can limit their exposure to refinancing by issuing longer dated debt. This comes at a cost, with investors usually expecting to receive more in interest for lending over longer periods, as described in Box 5.

INSIGHT

The need to repay existing debts means that much more needs to be raised from debt investors each year.

Box 5 - Maturity and interest rates - the choice

The length of time until a bond is repaid affects the cost of borrowing, the length of time before the interest rate is reset, and the amount of debt that needs to be refinanced each year.

For example, consider the choice between issuing a 30-year government bond and issuing a 2-year bond.

At 2.0%, the interest on a £1bn 30-year bond would be £20m a year, fixed for the next 30 years.

In comparison, a £1bn two-year bond yielding 0.5% would cost only £5m in interest each year, a saving of £15m a year.

This saving only relates to the first two years; as a new bond would then need to be issued, potentially at a higher interest rate. Over 30 years, there is a reasonable chance that 15 two-year bonds may pay out more than a single 30-year bond. Using two-year bonds also increases the amount that needs to be raised from investors each year.

In making this choice, debt management agencies must balance the attractiveness of short-term debt in minimising their cost of borrowing with the risk that interest rates could increase by more than the additional cost of issuing debt for longer periods.

In practice, most governments will issue a mixture of short-, medium- and long-term debt, balancing the amount of refinancing they need to do each year with the length of time they are locked-in to particular interest rates.

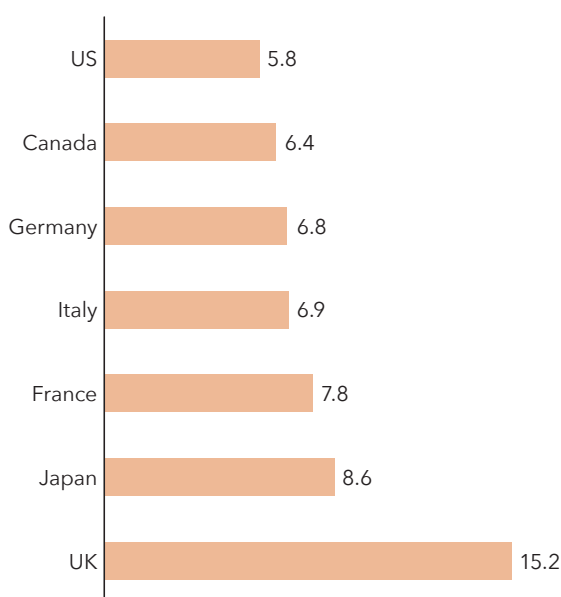
INSIGHT

The 12 most indebted countries need to finance £2.6tn of debt repayments in 2018, in addition to borrowing needed to fund operations.

Different governments have made different choices in the balance between short- and long-term debt.

This is illustrated in Figure 10, which summarises the average maturities of the government securities issued by major sovereign debt issuers.

Figure 10 - Average maturities in years



Calculated on a nominal weighted basis, excluding inflation uplifts. Sources: National debt management agencies.

In the UK, for example, government securities have an average maturity of over 15 years at 31 December 2017, an increase from 11 years in 2005.

One of the key drivers in the UK behind this longer-maturity profile is that the UK Debt Management Office has been able to take advantage of strong demand from domestic institutional investors for long-term debt to lock-in low interest rates for longer periods that would otherwise not be possible. Pension funds in particular have an appetite for index-linked gilts that provide a hedge against pension increases that are linked to the inflation rate.

This does mean that the UK has missed out to a certain extent on the ultra-low interest rates payable on shorter-dated debt. However, the benefit is that the UK will be less affected by interest rate rises than other countries that will need to refinance more of their debt portfolios in the next few years.

This is illustrated by Table 9, which shows how UK refinancing is much lower than in Italy or France, despite having similar levels of public debt.

Table 9 - Forecast funding in 2018

	Increase in net debt £bn	Debt to repay £bn	Funds to raise £bn
US ¹	291	672	962
Japan	56	891	947
Italy	20	161	181
France	56	122	178
UK	54	67	121
Germany	(33)	194	161
Spain	26	179	205
Brazil	121	155	276
Mexico	23	38	61
Belgium	7	25	32
Canada	(10)	78	68
Netherlands	(6)	53	47
12 countries	604	2,635	3,239
Other	198	Not known	Not known
76 countries	802	Not known	Not known

¹ Does not reflect higher borrowing expected by the US after tax cuts and spending increases coming into force in 2018.

Sources: IMF World Outlook Economic Database October 2017; national debt management agencies.

The cost of borrowing

Indebted countries expect to pay debt interest of £0.8tn in 2018, as summarised in Table 10.

This is equivalent to an average nominal interest rate of approximately 2.8%, based on dividing net interest charges over average net debt for the year.

Table 10 - Nominal interest in 2018

General government	Nominal interest £bn	Nominal interest rate %	Share of revenue %
US ¹	338	2.8%	7%
Japan	(1)	-0.02%	0%
Italy	56	3.0%	8%
France	33	1.8%	3%
UK	35	2.1%	5%
Germany	20	1.5%	1%
Spain	26	2.9%	6%
Brazil	109	12.9%	24%
Mexico	27	7.2%	16%
Belgium	8	2.2%	4%
Canada	8	2.5%	1%
Netherlands	5	1.6%	2%
12 countries	663	2.5%	6%
76 countries	798	2.8%	5%

¹ Excludes effect of higher borrowing in 2018 after tax cuts.
Source: IMF *World Outlook Economic Database October 2017*; ICAEW calculations.

Fortunately for Japan, it is currently borrowing at negative interest rates on average, meaning that interest is not absorbing money that could be spent on public services. This contrasts with countries such as Mexico and Brazil, where interest rates are much higher and so a greater proportion of their revenues are needed to service their debts.

The interest rates reported in Table 10 are based on nominal values. These don't take account of premia or discounts when securities are issued, which means that they do not represent the true cost of borrowing for the countries shown. For example, the UK's effective interest rate has been estimated by ICAEW to be closer to 1.7% rather than the 2.1% shown in Table 10.

Despite this, the rates calculated do provide a rough estimate of the cost of borrowing for the nations concerned.

Table 11 summarises recent market interest rates, ie, how much the UK and US governments would pay for new debt issued on 29 March 2018.

Table 11 - UK and US interest rates

Yields at 29 March 2018	UK	US
Base/federal reserve rate	0.50%	1.75%
3-month treasury bills	0.45%	1.71%
6-month treasury bills	0.55%	1.92%
2-year government bonds	0.82%	2.27%
5-year government bonds	1.11%	2.56%
10-year government bonds	1.35%	2.74%
30-year government bonds	1.71%	2.97%

Source: Bloomberg.

The effective interest rate paid on public debt reflects market interest rates when debt was originally issued. In the case of treasury bills, this will only be a matter of months ago, but for government bonds it might be several decades since the cost of borrowing was set.

As a consequence, changes in market interest rates will feed through gradually into borrowing costs, depending on when existing debts are repaid and refinanced with new debt.

INSIGHT

Interest on public debt is around 2.8% on average, but some countries can borrow much more cheaply than that, with Japan benefiting from negative interest rates.

INSIGHT

Higher interest rates will lead to higher costs for indebted countries, reducing the money available for public services.

Table 12 shows how the reported interest rate on the UK’s public debt has declined gradually over the last decade, from nearly 5% to close to 2% in the 2018-19 financial year. This has meant that although public sector debt excluding banks has increased by around 230% in that time, interest has grown by less than 40%.

Table 12 - UK interest on public debt

Public sector ex banks	Net debt ¹ £bn	Nominal interest ² £bn	Interest rate %
2006-07	523	24	4.8%
2007-08	557	24	4.5%
2008-09	768	26	3.9%
2009-10	1,012	24	2.7%
2010-11	1,158	37	3.4%
2011-12	1,253	39	3.2%
2012-13	1,364	35	2.7%
2013-14	1,464	34	2.4%
2014-15	1,555	31	2.0%
2015-16	1,603	31	2.0%
2016-17	1,675	33	2.0%
2017-18 FCST3	1,658	36	2.2%
2018-19 FCST	1,710	33	2.0%
2019-20 FCST	1,755	33	1.9%
2020-21 FCST	1,797	32	1.8%
2021-22 FCST	1,841	33	1.8%
2022-23 FCST	1,893	34	1.8%

1 Public sector net debt ex banks, also excluding Term Funding Scheme.
 2 Net interest comprises interest payable on government debt (eg, £46bn in 2017-18), less interest income (eg, £6bn in 2017-18).
 3 Reduction in debt in 2017-18 reflects £65bn reclassification of housing associations to the private sector.

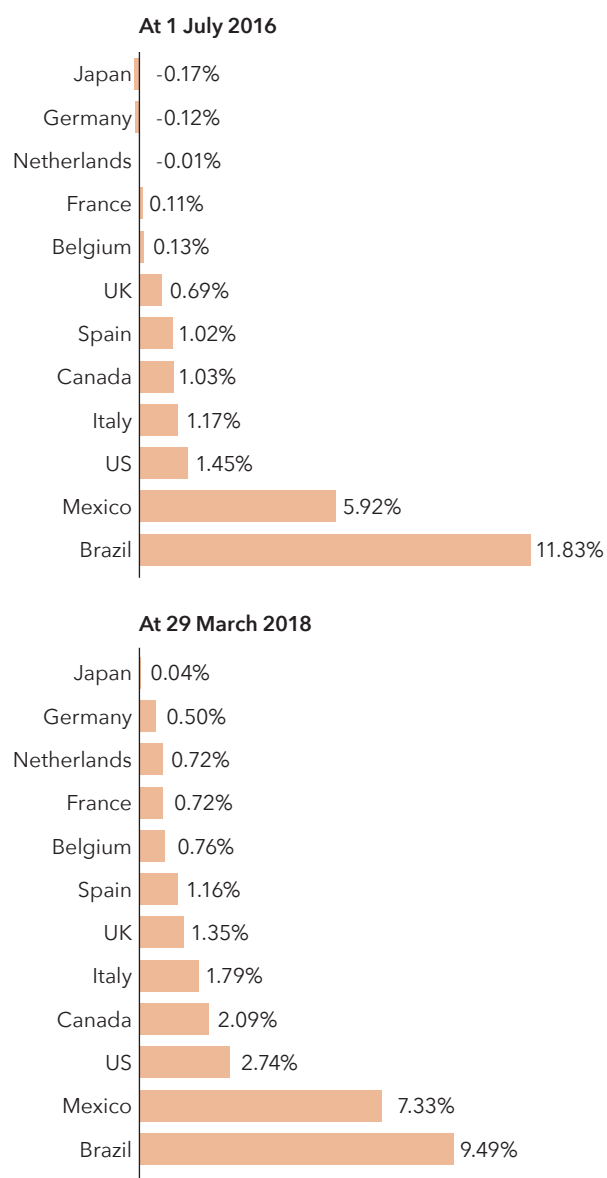
Source: Office for Budget Responsibility.

By adopting a policy of issuing debt for longer periods, the UK has paid out more in interest than it would have otherwise in the past few years. However, it should benefit from a less rapid rise in interest rates in the future than will other countries.

Market interest rates in most other jurisdictions also appear to be on the rise. For example, the base federal reserve interest rate in the US increased from a low of 0.25% in 2015 to 1.75% in March 2018.

Figure 11 illustrates how current 10-year government bond yields for the 12 most indebted countries have changed since July 2016, when yields were generally at their lowest level in recent years.

Figure 11 - 10-year government bond yields



Source: Bloomberg.

Quantitative easing

Since the financial crisis, the world of public debt has been revolutionised by quantitative easing (QE), a monetary policy tool that has been used by central banks to support the economy.

Although commonly described as ‘printing money’, this differs from the process of creating money in order to pay government bills. QE is closer to the process by which commercial banks operate: lending money in exchange for creating new bank deposits.

Under QE programmes, central banks have bought government and corporate securities from commercial banks in exchange for cash deposits. The objective of this exercise has been to reduce the cost of borrowing and to encourage commercial banks to lend more to businesses in order to encourage greater economic activity.

The financial effect of buying securities paying fixed interest in exchange for deposits paying floating rate is similar to that of an interest-rate swap, a common derivative financial instrument.

In the UK, for example, around a quarter of public debt has been swapped by QE from fixed to variable interest exposure. By purchasing gilts in this way, the Bank of England has changed the external profile of government debt, reducing the amount owed to external investors in gilts in exchange for a higher level of Bank of England deposits.

As the overall interest rate payable on gilts is higher than the current base rate, this has the effect of reducing the interest bill. In 2016–17, this saving was approximately £13bn.

The corollary is that governments undertaking QE are much more exposed to movements in short-term interest rates than they would otherwise be.

For example, if the UK bank base rate were to return to 5% (as it was in 2008), then interest charges on this element of the UK’s public debt would increase by £20bn a year, even before taking account of the higher cost of issuing gilts and treasury bills that would feed through more gradually into the interest bill.

Table 13 - QE at 31 December 2017

Quantitative easing	Gov’t securities £bn	Corporate securities £bn	Total balances £bn
Japan	2,899	372	3,271
US	1,884	1,358	3,242
Eurozone	1,657	348	2,005
UK	435	160	595
Total	6,875	2,238	9,113

Amounts shown are at amortised purchase cost, which differ from nominal values. UK amounts include Term Funding Scheme and Funding for Lending. China has been excluded as it is not an indebted country. Sources: US Federal Reserve, Bank of Japan, European Central Bank and the Bank of England.

The US has started to unwind its QE programme, actively selling government securities that it holds at a rate of around £40bn a month.

Japan continues to buy government securities and to lend to businesses under its QE programme, but it has slowed purchases in recent months. Similarly, the European Central Bank has recently reduced its bond purchases from €60bn to €30bn a month and it is expected to stop growing its balance sheet at some point during 2018.

INSIGHT

QE is an interest-rate swap, switching fixed-rate securities into variable-rate central bank deposits.

Unwinding QE will have consequences for debt markets.

The Bank of England has already stopped adding to its holdings of UK government securities, but it continues to buy replacement securities as existing holdings mature. It has yet to announce any plans to unwind its positions either through active sales or through a passive approach of not replacing securities when they mature.

The challenge facing these four central banks is that by unwinding their QE positions they could risk sharp declines in asset prices, potentially damaging the global economic recovery.

However, if they don't unwind these balances, or unwind them only passively, they will remain exposed to future increases in interest rates for a long time to come.

This could have an adverse effect on their respective public finances if interest rates increase significantly.

Box 6 - Quantitative easing in the UK

In January 2009, the Bank of England set up its Asset Purchase Facility. The aim was to buy high-quality assets (such as corporate bonds) financed by the issuance of Treasury bills with the aim of improving liquidity in credit markets. At the same time, the government also authorised the Bank of England's Monetary Policy Committee (MPC) to support monetary policy by purchasing financial assets in exchange for creating new deposits in the Bank of England.

The latter process is known as QE and has become a key part of the MPC's response to the financial crisis. Its aim is to increase private sector spending in the economy and help return inflation to target.

Decisions about QE are made by the independent MPC. With continued low inflation and weak economic growth, the MPC has, on several occasions, increased the target for gilt purchases, with the latest being to reach £435bn in gilt holdings by 31 March 2017.

The MPC has also extended QE beyond the purchase of gilts, with a £10bn corporate bond purchase scheme and a Term Funding Scheme of £127bn, the aim of which is to encourage lending by providing low-cost finance for up to four years to UK banks and building societies for onward lending to businesses.

The issue of new bank deposits by the Bank of England is sometimes described as 'printing money', even though it still gives rise to financial liabilities on which the Bank of England has to pay interest at the bank base rate, currently 0.50%.

Returns from the corporate bonds it has bought and interest on the Term Funding Scheme loans it has advanced should cover the cost of the deposits used to finance them. As a consequence, the principal financial effect of the Bank of England's QE programme has been to swap one form of debt (fixed-interest gilts) with another (variable-rate central bank deposits). This interest-rate swap has allowed the Bank of England to drive down market interest rates and to reduce the cost of government borrowing by around £13bn a year.

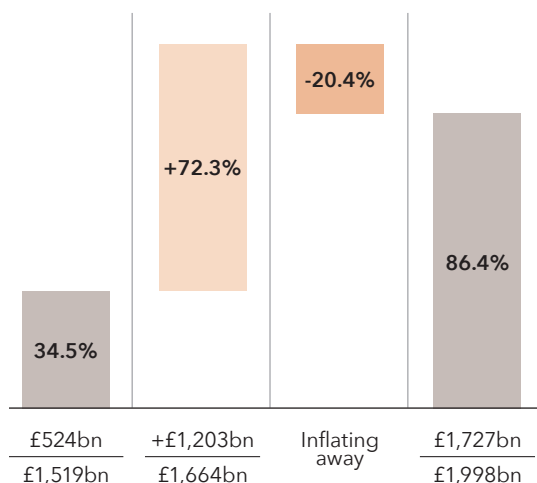
Inflation and inflation-linked debt

As tax revenues increase over time as a consequence of inflation and economic growth, the amount of debt that can be serviced will increase.

Governments have relied on this effect to ‘inflate away’ public debt over time, sometimes claiming that public debt is reducing even where it is increasing in cash terms.

This is illustrated in Figure 12, which shows how debt as a proportion of GDP went up by less than the amount that was borrowed by the UK over the 10 years to 31 March 2017. GDP increased by almost a third over the decade as a result of inflation and economic growth. As a consequence, the ratio of debt to GDP only increased by 51.9% despite the UK borrowing the equivalent of 72.3% of a year’s GDP in that time. In effect, debt of 20.4% of GDP was inflated away.

Figure 12 - UK debt/GDP 2007 to 2017



Sources: UK Office for Budget Responsibility; ICAEW calculations.

This is one of the reasons that many governments have adopted a target of borrowing no more than 3% of GDP each year, equivalent to 30% over the course of a decade.

As long as the combination of inflation and economic growth exceeds this rate, then debt to GDP should fall even as the amount of debt in cash terms increases.

To illustrate the effect of differing levels of inflation and economic growth over time, Table 14 summarises how the debt to GDP ratio in the UK has been eroded at differing rates in each of the last nine decades.

INSIGHT

Inflation has traditionally been good for governments, allowing them to ‘inflate away’ their debts.

Table 14 - UK debt to GDP 1927 to 2017

Year	Debt to GDP	Net borrowing	Inflating away	Debt to GDP
1927 to 1937	176.2%	6.2%	(29.5%)	152.9%
1937 to 1947	152.9%	169.0%	(63.1%)	258.8%
1947 to 1957	258.8%	(6.9%)	(128.7%)	123.2%
1957 to 1967	123.2%	17.6%	(57.0%)	83.8%
1967 to 1977	83.8%	26.9%	(62.6%)	48.1%
1977 to 1987	48.1%	33.3%	(46.7%)	34.8%
1987 to 1997	34.8%	33.3%	(20.7%)	47.5%
1997 to 2007	47.5%	2.6%	(15.6%)	34.5%
2007 to 2017	34.5%	72.3%	(20.4%)	86.4%
1927 to 2017	176.2%	354.3%	(178.1%)	86.4%

Sources: Office for Budget Responsibility; ICAEW calculations.

With central banks now mandated to target low inflation and with ageing populations imposing a greater burden on governments, it is unlikely that the high levels of erosion seen in the 20th century will be repeated in the same way.

In the UK for example, the Bank of England is now tasked with keeping consumer price inflation (CPI) close to 2%, compared with average inflation in the UK since 1948 in excess of more than twice that rate.

This slower rate of erosion means that national governments looking to finance themselves through borrowing are less able to inflate away their debts than they have been historically.

INSIGHT

Index-linked debt acts as a hedge against low inflation, but there is a cost if inflation rises.

Many governments have implemented austerity programmes to mitigate the effects of slower economic growth, particularly since the financial crisis.

Germany is an example of where growth in debt has been restrained by austerity in public spending and taxes increases.

This is not the only approach. Some governments have also sought to mitigate low inflation by issuing inflation-linked debt.

This can benefit governments by reducing the cost of debt when inflation is low.

The UK has been a key proponent, with approximately one quarter of its external debt in the form of index-linked gilts. These pay a small coupon each year (much lower than is paid on fixed-interest gilts), with the coupons and the principal amount paid on maturity uplifted each year in line with an official inflation index.

The US federal government has also issued Treasury Inflation Protected Securities (TIPS), albeit as only around 9% of US external debt is in this form, this is proportionately much less than in the UK.

Index-linked securities are popular with a number of investors as they are relatively secure investments that provide a protection against the effects of inflation. For instance, they are popular with corporate pension funds, insurance companies and other investors that have liabilities that increase with inflation each year.

An example of inflation-linked government securities is the 10-year US Treasury Inflation Protected Securities issued on 31 January 2018. This had a real yield of 0.72%, compared with the yield of 2.72% available on 10-year US treasury notes on the same date.

For an investor this means that they will earn more if inflation in the US averages more than 2% over the next 10 years, but if inflation is lower than 2% then they will end up losing out compared with investing in fixed-rate treasury notes.

The benefit for government is that inflation-linked debt acts as a hedge against low inflation, partially offsetting the slower erosion of debt caused by low levels of inflation.

Over the past three decades, this approach has paid off, with the UK in particular saving significant sums in this way.

However, if inflation is higher than expected then governments that have issued inflation-linked debt will need to pay out more to service their debts. Central banks should act to prevent inflation rising too far, but their success cannot be guaranteed.

Treasury strategy and debt management

The primary goal for debt management agencies and their respective finance ministries is to obtain funding at the lowest possible cost.

Each of them will have a treasury strategy, setting out how they plan to achieve this objective.

The UK's approach to raising and managing debt was established by a debt management review conducted in 1995. This set out an overall objective **'to minimize over the long term the cost of meeting the government's financing needs, taking account of risk, whilst ensuring that debt management policy is consistent with monetary policy'**.

This emphasises the importance of fostering a strong and liquid gilt market that remains open and available for new debt to be issued as required. It goes on to set out a principle that the UK should seek to balance its exposure to short-term and long-term interest rates and to inflation.

Other countries have adopted similar treasury strategies to the UK's, in line with recommended best practice by the IMF and the OECD. As a consequence, most indebted countries run open debt auctions, promote liquid markets for their government securities, and publish forward guidance on anticipated funding requirements.

This does not mean that all countries take exactly the same approach. Economies are different, as are the wider risks associated with running public services and the opportunities available to debt management agencies.

For example, in choosing to hedge against inflation, the UK has been able to take advantage of strong demand to issue over a quarter of its public debt as inflation-linked securities. Other countries might or might not have wanted to hedge against low inflation to the same extent, but whether they could in practice depends on potential demand from debt investors.

The UK has also been able to extend maturities to lock-in interest rates for longer periods and so reduce its refinancing requirements in subsequent decades. This contrasts with its neighbour France, for example, which, despite having a similar level of debt, has a very different profile for its government securities.

The UK is generally considered to be a leader in its approach to public debt management. It is, for example, one of the very few countries to perform a stress test on its public finances, considering the potential impact of a range of potential adverse economic scenarios. The results of these tests don't present a comfortable picture of what could happen if the economy takes a turn for the worst, indicating how important it is for policymakers to understand the risks that exist for the public finances.

Despite the sophistication of the UK's treasury approach, its formal treasury strategy hasn't been updated since it was written in 1995. This means that there is no clear statement of treasury strategy that formally addresses developments such as Bank of England independence in 1997, the global financial crisis in 2008, QE since then, and the UK's decision to leave the EU.

RECOMMENDATION

We recommend that governments carry out regular stress tests on their public finances and publish the results.

Only by examining a realistic range of economic scenarios can countries assess the likely impact of an economic downturn on their public finances.

There is a role for international bodies such as the IMF and UN to develop and promote standard toolkits to support governments in carrying out country-level stress tests.

INSIGHT
 Debt management agencies receive very little public scrutiny even though they are critical to the ability of governments to continue to operate.

Most countries have dedicated debt management units within their finance ministries. They are each responsible for issuing government securities, facilitating a liquid secondary market, for developing a treasury strategy and for mitigating risks associated with public debt.

Table 15 lists the debt management agencies for the 12 most indebted countries.

Table 15 - Debt management agencies

Country	Agency
Belgium	Belgian Debt Agency
Brazil	Brazilian Debt Management Office
Canada	Department of Finance Funds Management Division
France	Agence France Trésor
Germany	Die Finanzagentur
Italy	Dipartimento del Tesoro Directorate II
Japan	Ministry of Finance Financial Bureau
Mexico	Ministry of Finance and Public Credit
Netherlands	Dutch State Treasury Agency
Spain	Tesoro Público
UK	UK Debt Management Office
US	US Office of Debt Management ¹

¹ Debt operations are conducted by the Bureau of the Fiscal Service. Sources: National debt management agencies.

Unlike central banks, debt management agencies are not independent from their respective governments as their role is an integral function of governing.

However, in most cases they have a degree of operational autonomy in the way they seek to raise funds and to facilitate trading in government securities.

Despite being responsible for billions, or trillions, of public debt, debt management agencies are subject to very little public scrutiny.

In the UK, the Debt Management Office, an executive agency within HM Treasury, receives very little attention from parliamentarians; its last appearance in front of the House of Commons Treasury Committee was back in 2014.

Public debt management receives even less attention from the British public. For example, there has been minimal press coverage following the establishment of the UK Municipal Bond Agency to provide participating local authorities with direct access to external investors, bypassing the UK Debt Management Office.

This lack of interest in the capabilities and quality of debt management agencies extends to most countries; at least up until the point at which problems arise.

Risk

Debt management agencies seek to manage risks associated with public debt. These include:

- liquidity risk - the risk that funding may not be available when required to meet obligations, in particular the need to make debt repayments;
- interest rate exposure - how the cost of borrowing will change as interest rates move;
- inflation exposure - how the cost of borrowing will change as the rate of inflation changes; and
- currency exposure - how the cost of borrowing will change as currencies fluctuate. For countries issuing significant amounts of foreign currency debt, this could be significant.

Liquidity risk is the most important as governments are in trouble if they can't meet their financial obligations.

Debt management agencies therefore seek to ensure that government securities continue to be attractive to investors.

This involves operational measures to provide liquidity to government securities markets as well as seeking to maintain high credit ratings and so ensure the widest possible pool of investors. Interest rates can also be increased if necessary.

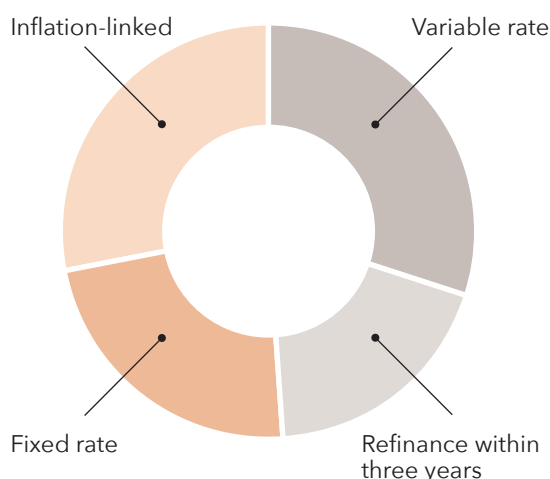
Liquidity is important even where debt is not increasing overall: debt management agencies still need to raise money to finance the repayment of existing debts as they fall due.

One way to minimise this exposure to market sentiment is to spread out the maturity dates of long-term government bonds so that the refinancing required in any one year is minimised.

Ultimately, indebted governments are dependent on the willingness of investors to continue to provide funds. Although governments could in theory use their 'backup credit line' in the form of their sovereign ability to print money, in practice this is only possible to a limited extent without risking significant adverse economic consequences.

This option is, in any case, not available to governments that have substantial debts denominated in foreign currencies.

Figure 13 - UK interest rate exposure



Sources: UK Debt Management Office; Bank of England; ICAEW calculations.

Figure 13 provides an illustrative picture of the interest rate and inflation exposures in the UK. It shows how exposed the UK's public debt is to changes in interest rates, with almost half of its public debt either at variable rates or due to be refinanced within the next three years.

INSIGHT

Good risk management is important if countries are to keep public debt under control.

INSIGHT

The IMF recommends that countries look at their balance sheets as well as cash flows in order to manage risk effectively. Unfortunately, most countries don't prepare full balance sheets.

Ideally, most public debt will be issued in the currency of the country concerned. This matches the currency of government revenue with the currency of the payments due. For domestic investors, this will also be the currency that they normally use.

Governments do issue debt in other currencies. This is primarily in order to access a wider pool of investors than are available domestically.

For more prosperous countries, this can be a matter of choice and only to a limited extent. For example, Canada issues US dollar denominated Canada Notes in order to tap into US credit markets, but these are a relatively small proportion of its overall debt portfolio. Indeed, given how interlinked the Canadian economy is with the economy of the US, this acts to a certain extent as a hedge, with a stronger US dollar likely to lead to higher government revenues in Canada at the same time as the amounts payable on Canada Notes cost more in Canadian dollars.

For some countries, however, issuing debt in a foreign currency is less a matter of choice or hedging strategy, but a necessity in order to obtain the money needed at reasonable cost. This can expose such countries to significant exchange rate risk, especially where compounded by a weakening domestic economy that leads to a fall against the currency in which debt has been issued.

Venezuela, for example, issued substantial amounts of public debt denominated in US dollars. This made sense given its domestic economy is dependent on oil revenues, also denominated in US dollars. However, all did not turn out so well when the oil price fell.

The IMF has published guidance for national debt management agencies, stressing the importance of developing a risk management framework and in monitoring financial exposures. This includes assessing contingent liabilities and implicit indemnities that could be triggered in certain circumstances, just as they were when commercial banks were rescued by governments during the financial crisis.

The IMF guidance also recommends that governments should have sufficient cash reserves available to meet immediate needs as well as closely tracking key metrics concerning debt, including debt to GDP, average interest rates, average maturities and currency exposures.

The IMF advises governments to look at their balance sheets as well as cash flows in order to have a better understanding of the financial risks across government, including those related to public debt. This is recommended even though the majority of governments do not publish complete balance sheets. This is easier for those that do, such as France, the UK, Canada, Australia and New Zealand.

Insights

- A decade after the corporate debt crisis, public debt is at an all-time high and continues to rise. The potential for a global public debt crisis should not be ignored.
- Just 12 countries owe £26.3tn, 90% of the total owed by indebted nations. Together they plan to borrow a further £1tn in 2018.
- Many governments rely on external finance to provide the funds they need. But how much debt is too much? There doesn't appear to be a clear indicator to tell us when investors might lose confidence and withdraw funding.
- Printing money to pay for spending sounds attractive, but the experience of countries such as Zimbabwe illustrate the pitfalls of such an approach.
- Public debt has tripled since 2001, with the US and Japan borrowing the most.
- The UK has seen its general government net debt grow by 9.9% a year since 2001.
- Multiple measures for public debt can cause confusion. But whichever measure is used, the numbers are big!
- On average, general government net debt of indebted countries is around two years' total revenues.
- Public debt is not the only liability on government balance sheets. Other liabilities and future commitments can be much larger.
- Liquid sovereign debt markets are important to being able to raise funds.
- Despite high levels of public debt, market sentiment is generally positive.
- The need to repay existing debts means that much more needs to be raised from debt investors each year.
- The 12 most indebted countries need to finance £2.6tn of debt repayments in 2018, in addition to borrowing needed to fund operations.
- Interest on public debt is currently around 2.8% on average, but some countries can borrow much more cheaply than that, with Japan benefiting from negative interest rates.
- Higher interest rates will lead to higher costs for indebted countries, reducing the money available for public services.
- QE acts as an interest-rate swap, switching fixed-rate securities into variable-rate central bank deposits. Unwinding QE will have consequences for debt markets.
- Inflation has traditionally been good for governments, allowing them to 'inflate away' their debts.
- Index-linked debt acts as a hedge against low inflation, but there is a cost if inflation rises.
- Debt management agencies receive very little public scrutiny even though they are critical to the ability of governments to continue to operate.
- Good risk management is important if countries are to keep public debt under control.
- The IMF recommends that countries look at their balance sheets as well as cash flows in order to manage risk effectively. Unfortunately, most countries don't prepare comprehensive balance sheets.

Glossary

Amortised purchase cost of debt	The price paid for debt plus interest accrued since that date, less coupons or principal received.	Market interest rates	The current yield to investors, equivalent to the effective interest rate payable on debt issued at that point in time.
Borrowing	Obtaining money in exchange for assuming a contractual obligation to repay that money plus interest.	Maturity	The date of the final payment due on a loan or security.
Cash	Money.	Monetary policy	An approach to managing a currency (commonly to achieve a target level for inflation) using a central bank's ability to set interest rates or to expand or contract the supply of money to an economy.
Central bank deposit	A financial asset (money) of a commercial bank or other depositor. A financial liability (debt) of a central bank.	Money	Physical currency or a bank deposit.
Chapter 9	US law for municipal bankruptcies.	National Accounts	Economic statistics for a country, including government finances. Prepared under statistical rules that differ from IFRS or IPSAS.
Chapter 11	US law for corporate bankruptcies.	Net debt	Gross debt, less cash and liquid financial assets.
Coupon	Cash payments on a loan or security that do not reduce the amount owed to the lender.	Nominal interest rate	Coupons divided by principal, expressed as an annualised percentage.
Effective interest rate	Interest divided by the amount borrowed, expressed as an annualised percentage. Equal to the yield to an investor at the date of borrowing.	Nominal value	The face value of debt, being the total principal due on a loan or security. (In the case of index-linked debt this only includes uplifts for inflation to date).
External investors	Individuals and non-public corporations owning public debt.	Principal	Cash payments on a loan or security that reduce the amount owed to the lender.
(Fiscal) deficit	A shortfall in government revenue compared with spending.	Public corporations	Government-owned businesses, including central banks.
Gross debt	Total contractual obligations to repay money borrowed, including securities, loans, bank deposits and finance lease obligations.	Public debt	Gross or net debt owed by government and public bodies.
IFRS	International Financial Reporting Standards.	Quantitative easing (QE)	The purchase of financial assets or the provision of a loan by a central bank in exchange for newly created central bank deposits.
Indebted	Owing more in gross debt than possessed in cash and liquid assets.	Real	After adjusting for inflation.
Interest	The difference between the amount borrowed and the total to be paid in coupons and principal.	Real interest rate	On inflation-linked debt, the interest rate before taking account of uplifts for inflation. On other debt, the interest rate after adjustment for the effect of actual or anticipated inflation.
Interest rate	The effective or nominal interest rate, depending on context.	Yield	The expected return to an investor assuming a security is held to maturity, expressed as an annualised percentage. Unlike the effective interest rate this changes over time as the value of the security varies.
IMF	The International Money Fund, an international bank for governments.		
IPSAS	International Public Sector Accounting Standards.		
Liability	A legal or similar obligation to pay cash or deliver value in the future that arises as a consequence of a current or past event.		
Liquidity	The availability of money when it is needed to meet contractual or other legal obligations.		

More about the authors

Ross Campbell



Ross is the Director, Public Sector at ICAEW where he leads ICAEW's work to improve standards in the management of the public finances, both in the UK and internationally. Before taking up his current role at ICAEW, Ross was the accounting policy lead and financial reporting standard setter for the UK Central Government at HM Treasury. Other recent senior roles in government include being the group chief accountant at the Ministry of Defence (MOD) and the director at the National Audit Office responsible for the value for money review of defence. Ross has also held a senior civil service role as head of commercial assurance and governance at the MOD, set up and led the department's commercial scrutiny and due diligence team and was also deputy director of the MOD private finance unit.

Martin Wheatcroft



Martin is the managing director of Pendan Fiscal Analysis, which specialises in providing insights into public finances. He works closely with ICAEW's Public Sector team and has co-authored a number of ICAEW publications, including *Funding UK Infrastructure* and *Managing the Public Balance Sheet*. Martin is also the author of the *Simply UK Government Finances* series of books and has contributed to the Institute for Fiscal Studies' *Green Budget* pre-Budget reports since 2015. As a senior financial professional with over 25 years of business experience he brings an external perspective to the public finances. Senior roles include being the group financial controller of AVG Technologies NV, an international software business, the chief accountant and then US controller of National Grid plc, a major UK and US utility, and a director at Deloitte, a global professional services firm.

Further information

International organisations

IMF - imf.org - imf.org/weodata

World Bank - worldbank.org - worldbank.org/en/topic/debt

OECD - oecd.org - oecd-ilibrary.org/finance-and-investment/oecd-working-papers-on-sovereign-borrowing-and-public-debt-management_22264132

National debt management agencies and other information about public finances

Belgium - debtagency.be

Brazil - tesouro.fazenda.gov.br

Canada - fin.gc.ca - budget.gc.ca - fin.gc.ca/purl/afr-eng.asp

France - aft.gouv.fr - performance-publique.budget.gouv.fr

Germany - deutsche-finanzagentur.de - bundesfinanzministerium.de

Italy - dt.tesoro.it - bancaditalia.it/statistiche

Japan - mof.go.jp/english/jgbs/debt_management - mof.go.jp/english/budget

Mexico - gob.mx/shcp/en

Netherlands - english.dsta.nl - government.nl/topics/budget-day

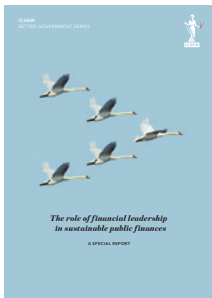
Spain - tesoro.es

UK - dmo.gov.uk - obr.uk - gov.uk/government/collections/whole-of-government-accounts

US - treasurydirect.gov - fiscal.treasury.gov - transparency.treasury.gov

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This special report addresses finance leadership and the role of accountants in the public sector. Rules and regulations imposed on the private sector have been introduced to address poor financial management practices in large companies, but similar standards do not apply to public sector bodies. Stronger standards over data quality, reporting disciplines and transparency could improve efficiency and effectiveness in the public sector.



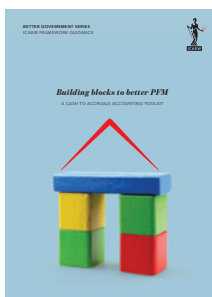
Managing the public balance sheet

This policy insight aims to help public officials understand what is in their balance sheets. The value of the information about different sorts of assets and liabilities and how some governments around the world are using it to support more effective policy-making. In particular, it is written to help governments ask the right questions to make the most of their financial information.



The UK central government public financial management system

While the UK system is transparent, the relationship between the government, acting on behalf of the Crown and Parliament is complex, with a number of parties involved in the overall process by which public expenditure is approved, managed and accounted for. This document aims to provide a simple and clear explanation of how the system works - in one short and accessible document.



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