Box B

Why Are Long-term Bond Yields So Low?

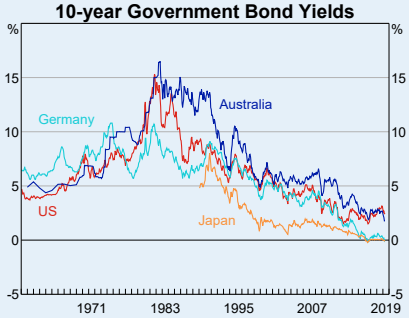
Long-term bond yields in major advanced economies have fallen noticeably over the past six months. In many cases, yields are close to, or have reached, historic lows, and in some cases are negative (Graph B1). The most recent declines have been largely driven by cyclical factors: global growth has eased, many central banks have revised down their growth and inflation forecasts, and market participants have lowered their expectations for central bank policy rates (see the 'International Environment' chapter).

However, these developments have occurred against the backdrop of a long-run decline in yields that has extended for several decades. This trend has been driven by slow-moving but significant structural changes in the global economy and financial markets. It can be better understood by decomposing long-term nominal bond yields into three components:

- expected real short-term interest rates (i.e. nominal rates adjusted for expected inflation);
- expected inflation; and
- a term premium, which is the extra return that investors require to hold a longer-term bond instead of investing in a series of short-term securities.

Graph B1

10-year Government Bond Yields



Sources: Bloomberg; FRED; RBA

Understanding how these individual components have contributed to the overall decline in bond yields can also provide a lens through which to interpret what the financial markets might be implying about the outlook for policy rates, growth, inflation and economic uncertainty more generally.

Expected real short-term interest rates

Financial markets currently expect central bank policy rates to be much lower on average in the future than they have been in earlier decades. This is true of policy rates when expressed in either nominal or real terms. This, in turn, primarily reflects the trend decline in estimates of the so-called 'neutral' rate of interest – the policy rate that is considered to be neither stimulatory nor contractionary for an economy over the medium term (Graph B2). Although it cannot be observed directly, estimates of the neutral rate can provide a useful guide for both central banks and financial market participants in determining the policy rate required to maintain full employment and stable inflation.

The long-run decline in neutral interest rates reflects the interaction of slow-moving fundamental factors that appear prevalent

across many advanced economies, including Australia. A rise in desired savings, or a fall in desired investment, as a share of income, will tend to reduce an economy's neutral rate of interest. These factors have been widely discussed in both Australian and international literature.[1]

Inflation expectations

Since its peak in the 1970s, inflation in advanced economies has declined to very low levels, and is expected to remain low for some time (Graph B3). As a result, investors currently demand less compensation for the erosion of the purchasing power of their savings. This decline in inflation and the emergence of stable inflation expectations that began in the early 1980s (when high real interest rates contributed to recession in many advanced economies) was reinforced with the adoption of inflation targeting by many central banks in the early 1990s.[2] In more recent years, a period where realised inflation outcomes have been below central bank targets in several major economies, despite unprecedented monetary stimulus, may also have contributed to a reduction in inflation expectations.

The term premium

Finally, the low level of long-term bond yields also reflects unusually low 'term premiums'. The term premium is the extra return that compensates investors for lending at a fixed rate of interest; this exposes the investor to the risk that interest rates might rise, in which case they would forego higher returns, including in the event that inflation is higher than expected. Historically, term premiums have tended to be positive but, on some measures, they are currently negative (Graph B4). The low level of term premiums can be traced to two factors: low uncertainty about future macroeconomic outcomes, and an increased presence of price-insensitive buyers for long-term government securities.

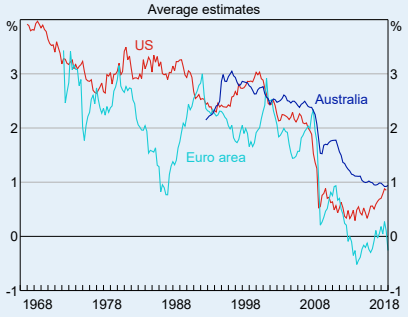
Macroeconomic influences on the term premium: the role of uncertainty

Where investors believe that *uncertainty* about the future level of real interest rates and inflation is low, the term premium will also be low (all else being equal). One indicator suggesting that investors' uncertainty is low can be seen in the price of options used to hedge against, or speculate

Graph B2

Neutral Real Interest Rates

Average estimates

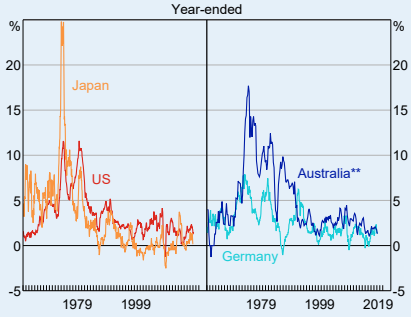


Sources: Holston; Laubach and Williams (2015); Laubach and Williams (2016); Lubik and Matthes (2015); RBA

Graph B3

Headline Inflation*

Year-ended



* PCE for the United States, CPI otherwise

** Excludes interest charges and indirect deposit & loan facilities; adjusted for the tax changes of 1999–2000

Sources: ABS; FRED; OECD; RBA

on, interest rate movements. The level of expected volatility implied by the prices of these options has been well below its historical average for a number of years and is currently close to all-time lows (Graph B5). This may also partly reflect technical factors in financial markets.[3]

Uncertainty around future real interest rates has declined for several reasons. As nominal rates are lower than in the past, they are more likely to encounter the effective lower bound in many economies. That implies that the distribution of future policy rates is truncated on the downside, which, in turn, narrows the range of uncertainty around future real rates. In addition, a number of central banks have provided more explicit guidance for future policy rates, which has lessened uncertainty about the path of policy rates to the extent that market participants view this guidance as credible. Finally, uncertainty around key determinants of real interest rates may have also declined, in particular economic growth rates.[4]

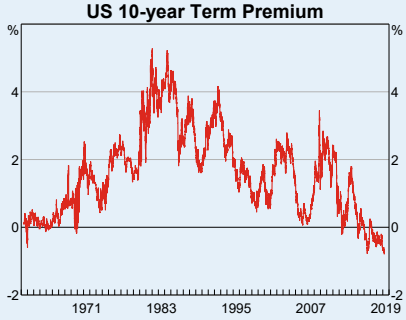
Similarly, uncertainty about future inflation appears to have declined, particularly over the past decade. A range of measures supports this: for example, the dispersion of CPI forecasts by market participants has narrowed steadily since 2010 (Graph B6). This greater certainty about future inflation in part reflects declines in actual, or 'realised', inflation volatility, and can be explained by the tendency for inflation volatility of the recent past to influence expectations about future inflation uncertainty (Graph B7).

Other influences on the term premium: the role of price-insensitive buyers

The rising influence of price-insensitive buyers (relative to the supply of long-term debt securities) will also have suppressed term premiums. Most notably, quantitative easing (QE) programs in the wake of the

Graph B4

US 10-year Term Premium

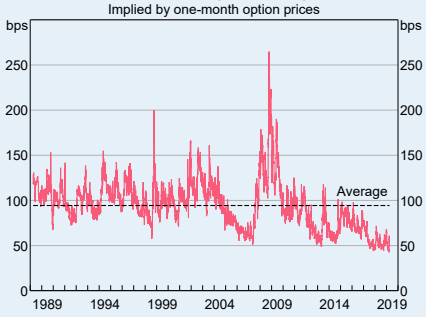


Source: Refinitiv

Graph B5

US Treasury Volatility

Implied by one-month option prices



Sources: RBA; Refinitiv

Graph B6

Dispersion of US Inflation Forecasts

10-year ahead CPI forecasts*

* Based on survey of professional forecasters, four-quarter moving average, dispersion is the 75th less 25th percentile

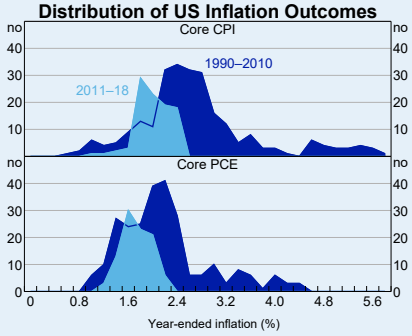
Sources: RBA; Refinitiv

Global Financial Crisis absorbed part of the supply of long-term government bonds available to the private sector (Graph B8). The Federal Reserve's QE program alone is estimated to have compressed the US 10-year term premium by around 100 basis points, although this is likely to have partly unwound of late.[5] In addition, there has been ongoing demand for long-term government bonds from other price-insensitive buyers, such as insurers and defined benefit pension funds, despite very low or negative interest rates.[6] These firms often have significant long-term liabilities with maturities that are longer than those of many financial assets. The resulting maturity gap means that the decline in bond yields increases the present value of these firms' liabilities by more than the present value of their assets. As a result, these firms have an incentive (and are often required by regulation) to purchase additional long-term assets to hedge interest rate risk. Finally, financial institutions have also increased their holdings of such assets, partly to meet requirements under stricter liquidity regulations in the wake of the financial crisis.

So, while the bond market may provide useful information about expectations for neutral interest rates, inflation and economic uncertainty, this is less the case when movements in government bond yields largely reflect the impact of price-insensitive buyers.

Graph B7

Distribution of US Inflation Outcomes

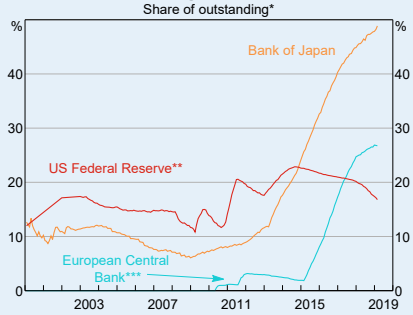


Sources: RBA; Refinitiv

Graph B8

Central Bank Holdings of Government Bonds

Share of outstanding*



* Central bank holdings of government bonds are at amortised cost, while government debt outstanding is at nominal value.

** Annual data prior to 2002

*** Denominator includes regional and local government debt consistent with the scope of ECB purchases

Sources: Bank of England; Bank of Japan; European Central Bank; US Federal Reserve

Endnotes

[1] For an overview of the drivers of global neutral interest rates see Rachel L and T Smith (2015), 'Secular drivers of the global real interest rate', Bank of England Working Paper No 571. For a discussion on Australia's neutral rate see McCririck R and D Rees (2017), 'The Neutral Interest Rate', RBA *Bulletin*, September. Available at <https://www.rba.gov.au/publications/bulletin/2017/sep/pdf/bu-0917-2-the-neutral-interest-rate.pdf>.

[2] Sánchez J and H Kim (2018), 'Why is Inflation so Low?', Federal Reserve Bank

of St Louis Regional Economist, First Quarter 2018.

[3] Market participants suggest that there has been an increase in the selling of instruments that protect against a rise in volatility (like US Treasury options) to generate additional returns in the low-yield environment. An increase in the supply of volatility insurance would reduce its price and therefore lower the expected volatility implied by these instruments. For more information, see RBA (2018), 'Box A: The Period of Low Volatility in Financial Markets', *Statement on Monetary Policy*, February, pp 25–26. Available at <https://www.rba.gov.au/publications/smp/2018/feb/box-a-the-period-of-low-volatility-in-financial-markets.html>.

[4] RBA (2018), 'Box A: The Period of Low Volatility in Financial Markets', *Statement on Monetary Policy*, February, pp 25–26. Available at <https://www.rba.gov.au/publications/smp/2018/feb/box-a-the-period-of-low-volatility-in-financial-markets.html>.

[5] Bonis B, J Ihrig and M Wei (2017), 'The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates', FEDS Notes, Washington: Board of Governors of the Federal Reserve System, 20 April. Available at <https://doi.org/10.17016/2380-7172.1977>.

[6] RBA (2015), 'Box A: Effects of Low Yields on Life Insurers and Pension Funds', *Financial Stability Review*, October, pp 16–18. Available at <https://www.rba.gov.au/publications/fsr/2015/oct/box-a.html>.