

# CBA's director of interest rate strategy says demography is destiny for interest rates, but immigration a fountain of youth

Posted in [Bonds](#) February 01, 2017 - 06:38am, [Jarrod Kerr](#)



By Jarrod Kerr\*



We are in the middle of a seismic shift.

The post-war baby boom was the largest in human history. The baby boomers are now retiring. Their influence on interest rates is profound, and understated.

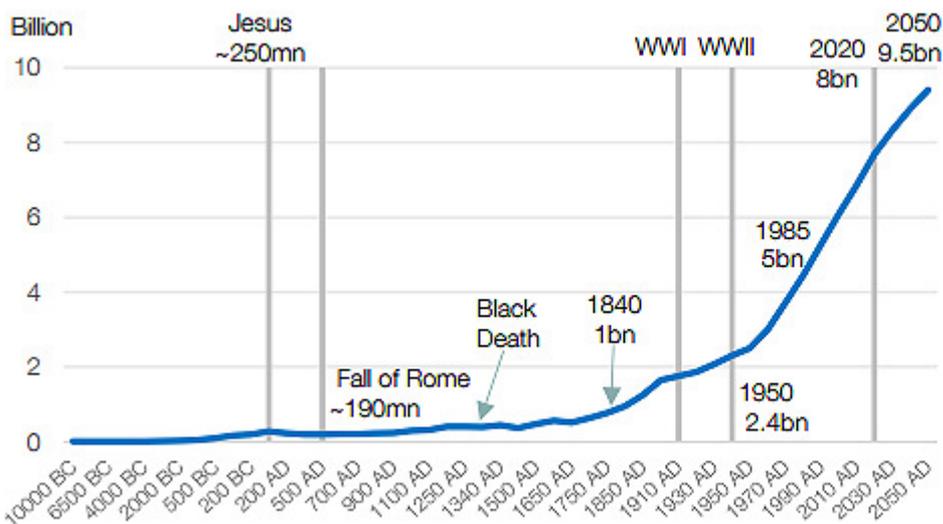
The three **Ps of growth** are in metamorphosis. The first P, population, is waning as fertility rates decline. The second P, participation, is declining as populations' age. The third P, productivity, is also being weighed down by ageing populations.

Fed researchers say demography explains ALL the decline in real interest rates. We think this fits with other work showing the US real neutral rate is near zero and that market pricing for the Fed to only slowly raise rates to 2% is not too aggressive.

We are not all created equal. There is one differentiator. Immigration is the fountain of youth. Interest rates in high migration nations like the US, Australia and New Zealand, should diverge further from old Europe and Japan.

The risks are evening up and we see room for Treasuries term premiums to lift and take 10yrs to 3.0%. But the demographic story tells us we shouldn't be looking for much more on a through-the-cycle view.

**Figure 1: Global population estimates.**



In Figure 1, we plot global population estimates over the longest time frame.

The end of two world wars spurred the greatest boom in human history.

In figure 2, we illustrate the unprecedented surge in global population growth post war.

Growth is now waning.

Source: US census bureau, Thomlinson, Biraben, Durand, Haub, McEvedy

The end of two world wars spurred the greatest boom in human history.

We often hear of the impact of demographics. Demographic shifts influence just about everything we touch. We are in the middle of the largest demographic shift ever experienced. The seismic shift will keep a lid on potential growth and real yields. Yields can rise from here, off historic lows. But we are unlikely to see the levels once

**Figure 2: Global population growth.**



Source: US Census Bureau, CBA estimates

deemed “normal”, prior to the great financial crisis.

Interest rates experienced during the great inflation period of the 1970s and 80s are the anomaly – generated by the largest surge in population ever recorded. A population surge that boosted growth, put an enormous strain on resources, and caused inflation to spiral to levels no longer allowed.

Expansionary fiscal policy and regulated market structures, compounded by OPEC, no doubt contributed to higher interest rates. But, according to the US Fed, demographics explain ALL of the subsequent decline in real interest rates, and potential growth rates. That may be excessive, but it fits neatly with theories of a new normal that we think will keep interest rates and bond yields low. Notwithstanding some rise in term premiums to come.

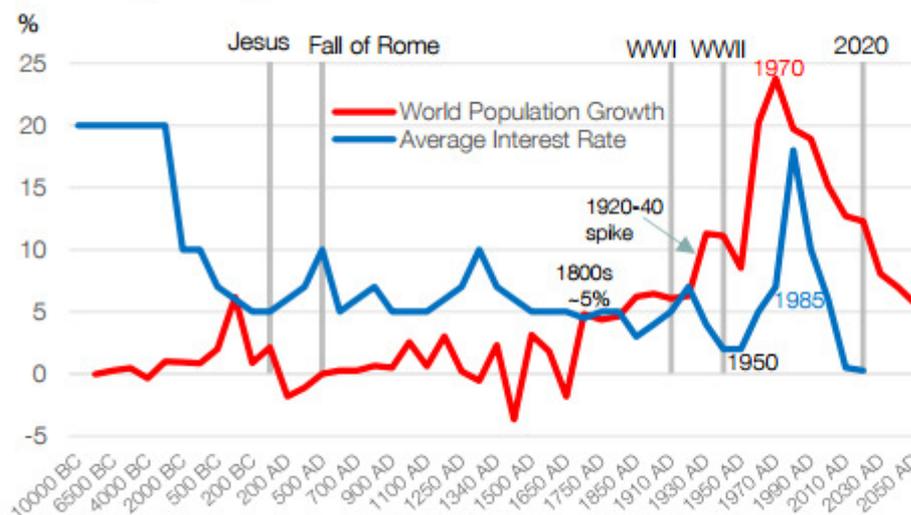
**The population boom like no other, drove the never before seen spike in interest rates**

In Figure 3, we overlay global population growth with global interest rates back to 3000BC. What stands out is the baby boom, and the impact on interest rates. The peak in population growth is long behind us, so too is the peak in interest rates. We are now in a “new normal”, with lower terminal rates. We are not all created equal, however. Australia is much younger than most. And fertility is not the source of Australia’s youth. Immigration is the

fountain of youth. Immigration policy influences the three Ps of potential growth, and suggests growth and interest rates will be higher in countries like the US, Australia and New Zealand.

Early interest rate settings ~3000BC were between 20-40%. Interest rates declined as markets evolved, and averaged a much more civilised 5.5% between 500BC and 1910. Churches and Kings were known to control interest rates, from time to time. By 1950, following two world wars and a great depression, interest rates had fallen to the lowest levels ever scribed. A record low that was smashed 66 years later with the advent of negative interest rates. The 'great inflation' period of the 1970s and 80s stands out. The spike in population preceded the spike in rates.

**Figure 3: Population growth and interest rates.**



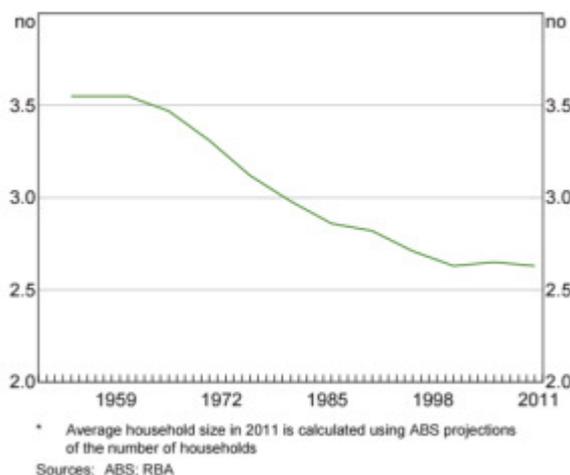
**Figure 3 overlays population growth and interest rates.**

**Two world wars truncated population, but set the scene for the largest boom ever seen.**

**Population growth is forecast to decline out to 2100. And interest rates will be weighed lower.**

Source: Bank of England 1, US census bureau, Thomlinson, Biraben, Durand, Haub, McEvedy. CBA.

**Figure 4: Average Australian household size.**

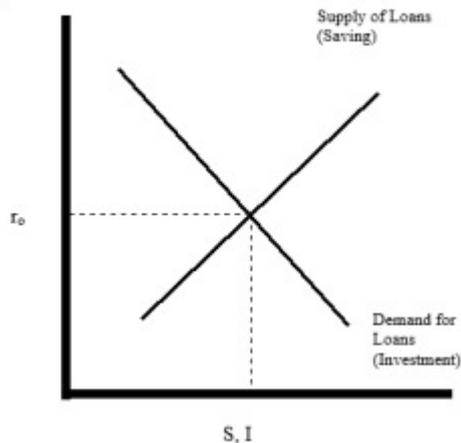


Global population jumped from ~2-to-2.5bn in 1945-50, to ~4.5-to-5bn in 1980-85. In just 35 years we more than doubled our population. The impact of the tsunami of baby boomers was profound. The surge in population induced the highest levels of interest rates in 5000 years. Interest rates peaked in the early-80s. From 1985 to 2020, the subsequent 35 years, it is estimated our population will rise to ~7.7bn. That's another 2.7bn increase, but off a much higher 1985 base of 5bn. The rate of growth has halved from that experienced in the baby boom.

The decline in population growth has coincided with a 30 year decline in interest rates. Population growth will continue to slow for the next 35 years. From 2020 to 2055, the next 35 years, global population is forecast by the IMF to hit 9.5bn (+1.8bn). Population growth will halve again. Society has changed. Fertility rates have declined since the 1960s. Family sizes have declined (Figure 4). There has been a steady rise in childlessness, higher divorce rates, and later marriage. There has also been a healthy lift in female labour force participation. Reduced

population means reduced pressure on resources and rates.

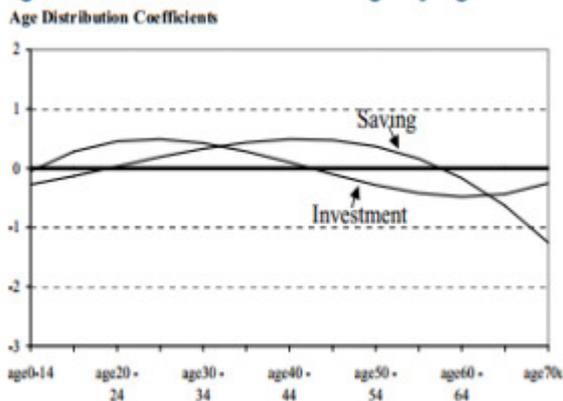
**Figure 5. Wherever the D and S shall meet.**



An interest rate is simply a price for credit. The two most beautiful lines that shall ever meet are supply and demand (Figure 5). The supply of credit, (savings), balances the demand for credit, (investment), at a price, (interest rate). Baby boomers became productive in the late 60s and demanded interest rate product. The greatest spike in global population growth preceded the greatest spike in global interest rates. A surge in demand for global resources, played out most notably in commodity markets, but also interest rates (the “D” line shifted out). The three Ps rose, real growth rose, real rates rose, but inflation pushed nominal rates into the stratosphere.

The demand shock for all resources took place at a more supply-constrained time. Regulated labour markets and product prices, and geopolitical oil shocks (plus “peak oil” theories) were rigidities that took years to overcome. Rampant commodity price inflation fuelled the rise in nominal interest rates. Deregulation was the response of the 1980s. Global trade and competition took off as Eastern Europe, Asia’s tigers and China entered the world economy, with the impact exacerbated by disruptive technology and globalisation.

**Figure 6: Investment and savings by age**



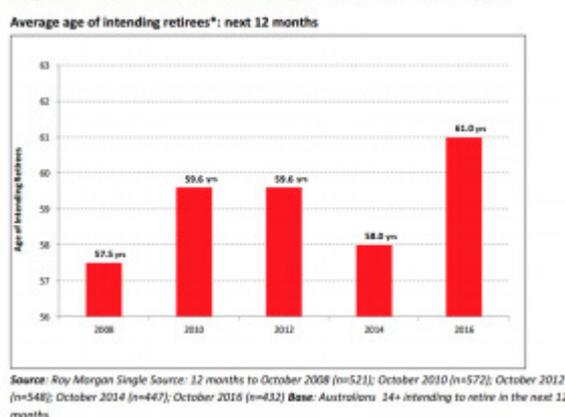
Source: Bosworth and Chodorow-Reich

Fast forward to today. There is push-back against immigration, competition and globalisation. That could give rise to an inflation pulse in due course. But more importantly, baby boomers have been retiring and supplying interest rate product. A large driver of the glut in global savings has been the saving of baby boomers into their retirement (the “S” line has shifted out). We do most of our savings in our working years, and savings accelerate into retirement (Figure 6). That wave of baby boomers may have reached “peak” savings in developed countries but there’s still a global wave to flow through as populations age in many developing countries.

The supply “glut” has occurred at a time of higher production capacity, globally. China’s export-led investment boom has run into a western savings boom and a (related) global financial crisis, but it hasn’t yet developed a consumption model of its own. We’re simply producing much more for less. Labour markets are more flexible, prices are generally market driven, and the supply of commodities, globally, has now caught up and risen substantially. The increased supply of commodities has driven much of the decline in prices in recent years.

Reduced commodity price inflation has reinforced deflation fears.

**Figure 7: A lift in average retirement age**



The next phase, is retirement, where savings declines (Figure 6). The baby boomers will slowly unwind their savings over the next 20-30 years. Eventually, the supply curve (of loans) will contract back. But it will be a long, slow process. Roy Morgan recently produced the results of a survey on intending retirees in Australia. The average age of intending retirees has lifted from 57.5 to 61 (Figure 7). The average age rose post crisis, dropped in 2014 with the rejuvenation in financial markets, and has now blown higher with the continued decline in deposit savings rates. Not surprisingly, the survey of ~50k respondents showed that gross wealth (excluding owner-occupied homes) of intending retirees is up just 3.6% since 2014.

The other, yet to be tapped, source of wealth is the family home. "A clear majority (85%) of intending retirees either own or are paying off their home, with an average value per person of \$495,000 or 73% higher than the average (\$286,000) in all other retirement funds." The value of that dwelling has jumped 43.5% since 2008. Demographics shape property markets. Retiring owner-occupiers supply large dwellings in search of small, high density, dwellings. Young families and migrants upsize.

**The Bill Kerr example: there's at least one in every family, probably four.**

*My father was born in 1947. He is the second of four baby boomers. He became productive in the 1970s when he joined the workforce, after a tour or two in the NZ navy. He demanded an interest rate, in the form of a mortgage, to build his first house. Later, he demanded another interest rate, to start his first business. Interest rates were in demand. Interest rates went well into the teens, some were above 20%. 35 years later the business has been sold. The family home went under the hammer. And the old boy has downsized and retired to Mangawhai Heads (north of Auckland) with a war chest of savings. He now supplies an interest rate. The interest rate he supplies, in the form of a fixed rate deposit, is far less than he had imagined.*

*Despite his son, an interest rate strategist, convincing him to fix into the falling yield environment, yields are much lower than any forecast a decade ago. And fixed rates only last so long. Risk appetite is something the old boy does not have, not at his age. Supply of term deposits are sticky for this age bracket.*

*Of course the four Kerr boomers had children of their own. But they had ~2 children each, not four like their parents. And the grandchildren are having fewer children than their boomer parents. We only want 1 or 2. Four children just seems inhumane...*

*Bill Kerr is just one man, one example, one in the millions of baby boomers now retiring into a low yield environment. Asset rich retirees have much lower risk appetite. Interest rates are currently on the rise. But the stock (supply) of global savings hunting yield remains high. Baby boomer savings rates will naturally run down, as retiree's consume their nest eggs. And interest rates may eventually lift to higher levels. That may be a problem I'll leave to my son Lachlan to figure out, on behalf of his old man.*

**Figure 8: Interest rates in England, the United States, Australia and New Zealand...**

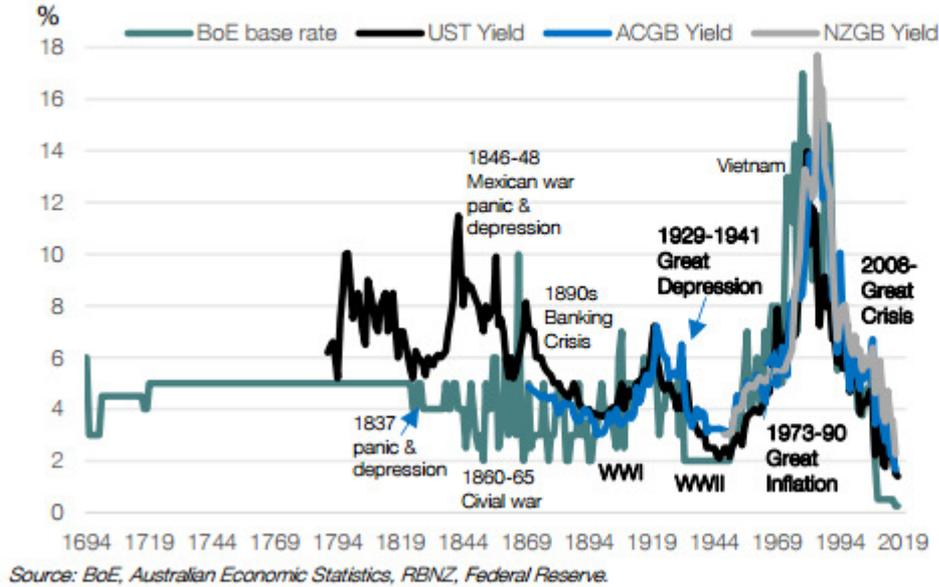
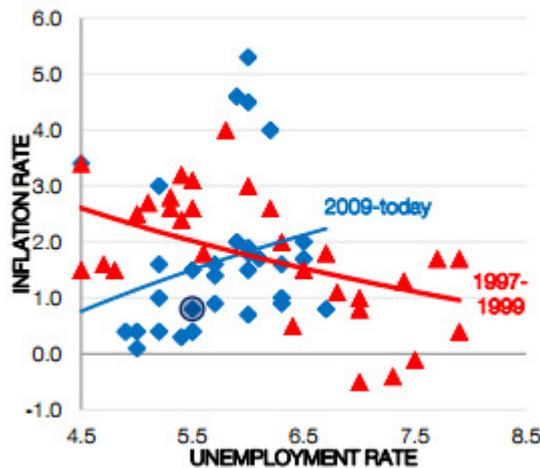


Figure 8 plots the BoE's base rate for longevity back to 1694. We plot government bond rates in the US (1790), Australia (1870), and New Zealand (1940).

New Zealand is a relatively "young country that seemed to have poor document storage techniques at the time" (RBNZ).

Figure 9 plots the famous Bill Phillips curve for New Zealand. The relationship between inflation and unemployment (or slack), is a staple for central bankers.

**Figure 9: The Kiwi Phillips Curve no more.**



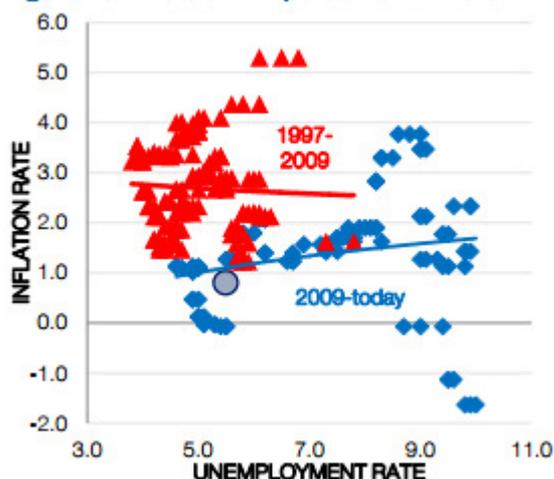
**Demography is destiny** *Source: Bloomberg, CBA estimates*

The correlation in global interest rates has strengthened since WWII. Globalisation has strengthened the interconnectivity of markets. The great inflation period was case in point. All populations surged, all markets rose. Inflation was then deemed evil by central banks. Despite poor record keeping, the Kiwis were the first to directly target inflation in 1989. Don Brash, then RBNZ Governor, referred to the great inflation period as a great tax on savers. Brash also noted real estate as an inflation hedge, during the 1970-80s. Central banks spent the next 25 years riding inflation down to targets of ~2%, successfully anchoring inflation expectations. Job done. Well, they did some of the job. It turns out demographics did most of the heavy lifting, on the way up, and on the way down.

Phillips curves have now inverted. The decline in the Phillips' curve can be attributed to demography, globalisation, and central bank behaviour. Inflation targeting anchored expectations. The decline in inflation was also driven by globalisation, or the rise of Asian manufacturing. The Asian rise has in part fuelled political discontent in the West (Brexit and Trump). Future inflation expectations have also become more backward

looking2. Post-GFC, the threat has been losing control of expectations to the low side.

**Figure 10: The US Phillips Curve no more.**



Source: Bloomberg, CBA estimates

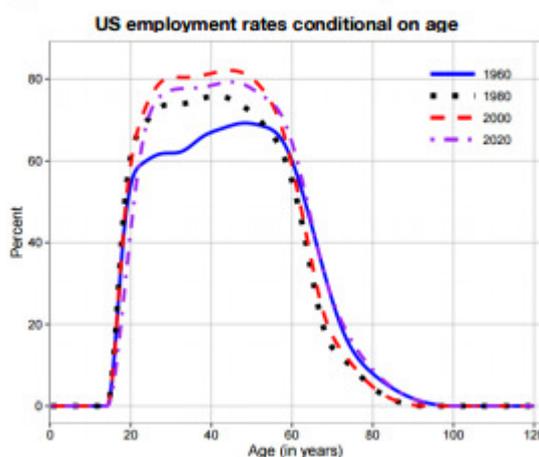
Demographic forces have ballooned in the last decade as baby boomers retire. The decline in inflation has been weighed down by ageing populations. Ageing populations have lower productivity and wage expectations. Figure 11 highlights the cliff in participation past the age of 60. A cliff that has worsened since the 1960s. Deflation was (still is?) the threat. And risk appetite remains impaired. Panicked investors still pay for protection of capital. Negative interest rates are an intergenerational wealth transfer. Negative rates “transfer” wealth from savers (elderly) to borrowers (younger generation). Negative rates are a tax of savers.

According to the US Fed, demographics explains ALL of the decline in real interest rates and potential growth rates. The Fed’s [demographic model](#):

*“accounts for a 1¼ percentage-point decline in both real GDP growth and the equilibrium real interest rate since 1980 - essentially all of the permanent declines in those variables... The model also implies that these declines were especially pronounced over the past decade or so because of demographic factors most-directly associated with the post-war baby boom and the passing of the information technology boom. Our results further suggest that real GDP growth and real interest rates will remain low in coming decades, consistent with the U.S. economy having reached a new normal.”*

The Fed notes that the influence of demographics has been “easily misinterpreted as persistent but ultimately

**Figure 11: We don’t work much past 60.**



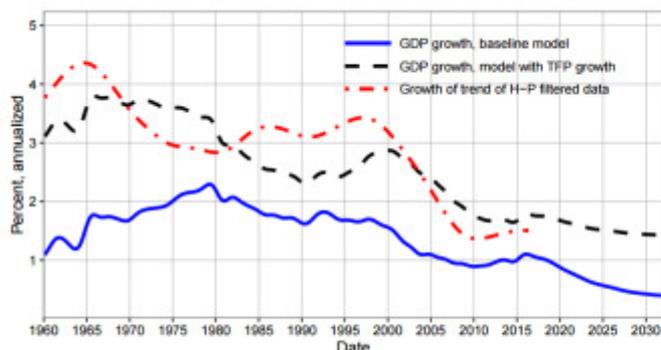
Source: [Understanding the New Normal: The Role of Demographics](#)

temporary influences of the global financial crisis”.

The implication from the Fed’s research is “the persistence of a low equilibrium real interest rate means that the scope to use conventional monetary policy to stimulate the economy during typical cyclical downturns will be more limited than it has been the case in the past for a given inflation target.” Demographics explain much more than most dare admit. Policy makers may be at the helm of a ship, with a tiny rudder.

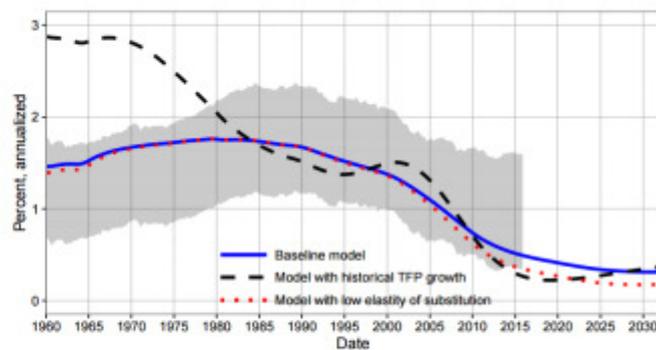
Figure 12 shows the decline in the real rate of growth from a peak above 2%, to a current rate sub-1%, and a forecast decline to ~0.35%. Figure 13 illustrates a similar forecast decline in the real rate of interest from ~1.75% in the 1970s-80s to ~0.35% out to 2030.

**Figure 12: The Fed's modelled rate of real GDP growth.**



**Source:** Authors' calculations using data from the U.S. Bureau of Economic Analysis and authors' model simulations.  
**Notes:** The figure shows real GDP growth under the baseline simulation, which has no time variation in technology growth, and the alternative scenario in which technology growth varies according to an estimate of its historical and projected trend. The figure also shows the growth rate of the trend in realized real GDP after applying the Hodrick-Prescott filter with a Lagrange multiplier of 25,000.

**Figure 13: Fed's modelled rate of real interest.**



**Source:** Authors' model simulations.  
**Notes:** The figure shows the equilibrium real rate under the baseline simulation, which has no time variation in technology growth, and the alternative scenario in which technology growth varies according to an estimate of its historical and projected trend. The figure also shows an alternative scenario in which the elasticity of substitution between capital and labor in the production function is set to 0.75, as opposed to 1 under the baseline simulation. The results are shown against the 50-percent uncertainty bands from Johansen and Mertens (2016b).

The Fed's demographic work fits with other aspects of the 'new normal' theory, including Larry Summers' 'secular

**Figure 14: Estimated natural rates of interest\***



**Source:** Holston, Laubach, and Williams (2016); four quarter moving averages  
*\* The real short-term interest rate consistent with the economy operating at its full potential once transitory shocks to aggregate supply or demand have abated, say, 5 to 10 years in the future*

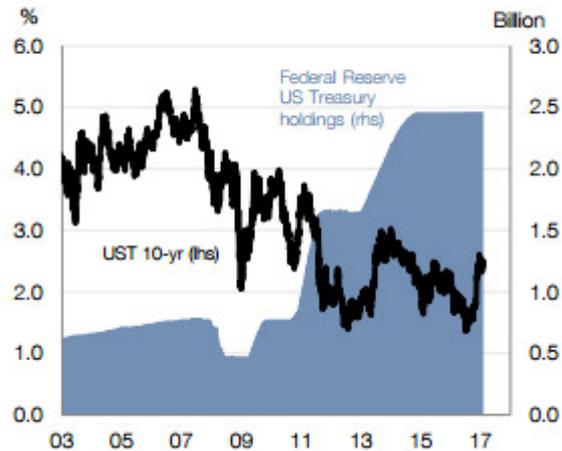
stagnation'. San Francisco Fed President Williams re-published estimates of the natural rate of interest last year, arguing that it had fallen to near zero in the United States and Europe. He believes this rate, where monetary policy is neither accommodative nor expansionary, has fallen to historically low levels, and will stay there.

Figure 14 plots the estimated natural rates of interest since 1980. Natural interest rates had declined from a 2.5-to-3.5% range in the early 1990s to 2.0-2.5% pre-crisis. Following the GFC, the estimated ranges have collapsed to 1.5% for Canada and the UK, near zero for the US, and well below zero for the Euro Area.

*The underlying determinants for these declines are related to the global supply and demand for funds, including shifting demographics, slower trend productivity and economic growth, emerging markets seeking large reserves of safe assets, and a more general global savings glut... Importantly, this future low level of interest rates is not due to easy monetary policy; instead, it is the rate expected to prevail when the economy is at full strength and the stance of monetary policy is neutral. - (Williams, San Francisco Fed).*

We think very high global debt dynamics and abundant spare capacity in the global economy also explain why

**Figure 15: Federal Reserve Treasury balances**



Source: CBA, Bloomberg

the real natural rate of interest has dropped.

Fed Chair

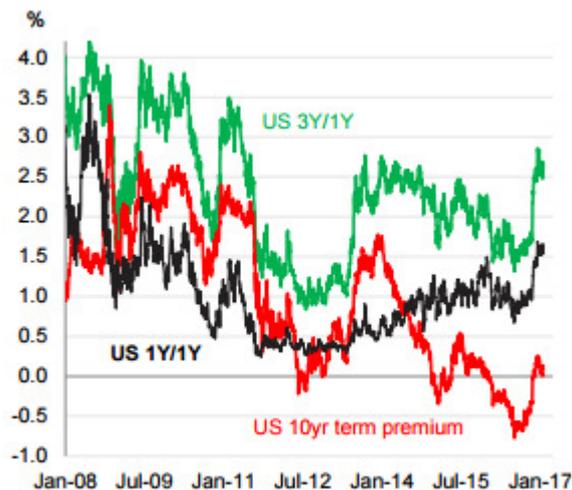
Janet Yellen added a possible paucity of attractive capital projects and a more cautious consumer after the GFC to the list of possible reasons for the decline in the neutral rate of interest last August (though these are really just demographics at work).

Yellen believes “that monetary policy will, under most conditions, be able to respond effectively” to future downturns in the economy even if interest rates are much lower than in the past (through the use of more QE and interest rate guidance). But she didn’t sound confident. And she didn’t disagree with the notion that the real neutral rate is 0%. Which means she won’t be in a rush to raise rates to this level even if inflation ticks up.

*“If the natural rate remains low, future episodes of hitting the zero lower bound are likely to be frequent and long-lasting... This will necessitate a greater reliance on unconventional tools like central bank balance sheets, forward guidance, and potentially even negative policy rates.” - (Laubach and Williams, US Federal Reserve)*

A real rate in the US that averages 0-0.5% would equate to a nominal Fed Funds rate averaging around

**Figure 16: US short vs long bond pricing.**



Source: CBA, Bloomberg

2-2.5%.

We maintain that it will be tough for the market to price a terminal Fed Funds rate of much more than this. For bonds, the question is how much term premium should be added on top. The factors cited above point to a continued low or negative term premium. But, with a new regime in the White House embarking on a stimulatory fiscal policy and intent on changing currency, finance, trade and foreign policies, we argued in our 2017 [Outlook](#) that this is precisely one occasion when the term premium should rise.

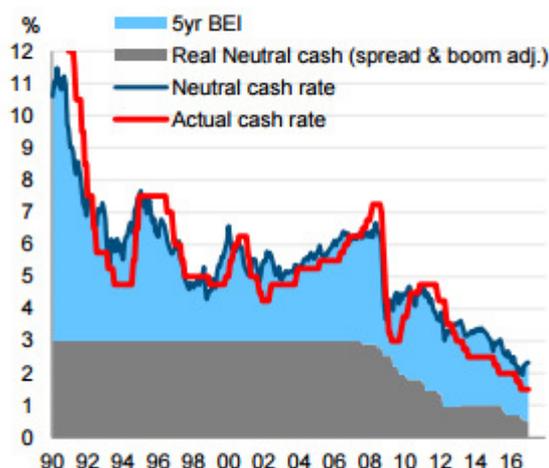
The Fed’s QE programme, or size of balance sheet, continues to exert significant downward pressure on US yields (figure 15). Fed modelling shows that QE has pulled the US 10-year yield down by around 100bps. Ending reinvestments would cause a “passive” removal of this accommodation but seems a long way off. Still, Janet

Yellen recently noted that even the current policy is resulting in a shortening of the Fed's maturity profile that "could increase the yield on the 10-year Treasury note by about 15 basis points... over the course of 2017... all else being equal."

Figure 16 shows that normalisation of the term premium has been a source of the rise in bond yields over the last 6 months. But there is likely more to go. If the nominal Fed Funds rate averages around 2-2.5%, a rise in term premium for 10-year bonds back to 50-100bps implies that yields on 10-year US Treasuries may range between 2.5-3.5% in the years ahead, averaging about 3.0%.

A lower term structure in the US means a lower term structure

**Figure 17: Actual Australian cash rate vs est. rolling neutral rate**



Source: CBA, RBA, ABS, Bloomberg

globally.

US Treasuries are the global benchmark, because of size and liquidity. Real rates have entered a 'new normal', but divergences persist. Figure 14 shows a divergence in estimated natural rates.

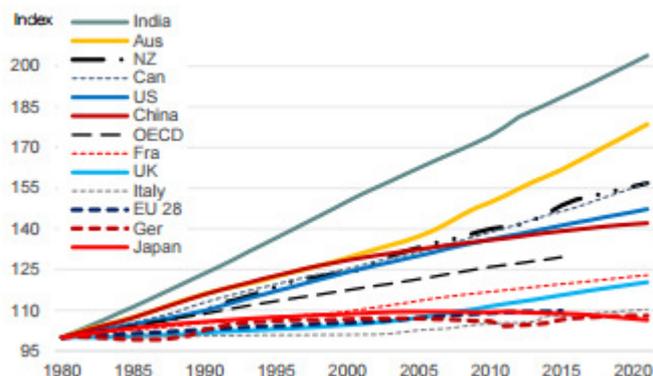
We think Australia's real neutral rate has come down to around 0.75% (Figure 17, which updates numbers for analysis published in 2014, when we had the estimate at 1.0%). Adding a higher long-term inflation target suggests there is a healthy margin versus the US of at least 1.0% in nominal terms and closer to 2.0% versus Europe and Japan (not that we expect Australia to be near capacity or the mid-point of the 2-3% inflation target for a number of years).

We're interested in whether these divergences are likely to persist. The US has a relatively young population because the US attracts young migrant workers. Australia and New Zealand even more so. It's a numbers game.

Figure 18 plots the stark divergences in population growth, indexed back to 1980.

**Figure 18: Population growth indexed to 1980.**

We indexed population growth from 1980, due to depth of data available and to show divergences after the "peak" in global population growth.



Source: IMF WEO, CBA

India, Australia, New Zealand, Canada and the United States have well above average population growth. China's growth is slowing, quickly, and off a very high

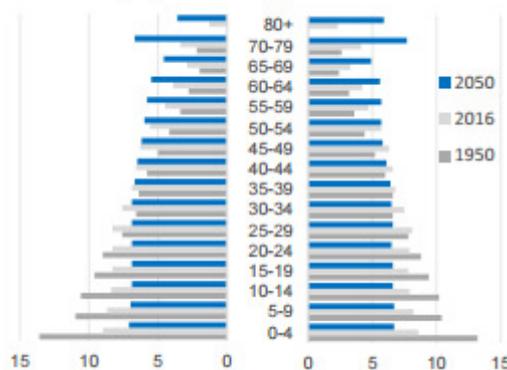
base. Population growth in France and the UK are a bit below the OECD average, but well above the EU 28 average. UK growth has picked up dramatically since 2005, a trend that the populous has voted to break through Brexit. Germany's population was contracting, until the Syrian refugee crisis. Japan's population is contracting, with no end in sight.

Real rates in the US are higher than ageing peers such as Germany, Japan, and Italy. US rates will remain well above Japanese and European rates. Antipodean rates will remain above US rates. In this numbers game, migration matters the most.

### Migration is the fountain of youth

As we age, we participate less. The fall in participation rates across much of the ageing world is related to the rising share of people over 60. The 'normal' so-called global population pyramid now looks more like a Trump tower (Figure 19, males on left, females on right). There's a lot of advertising up

19. Global population "pyramid"



Source: US census bureau, CBA estimates

top. Although it's what happens around the foundations that defines us. In 1950, less than 1% of OECD population were over 80 years old. By 2050, more than 10% will be over 80 years old. Japan has the oldest of the old.

Figure 20 shows Japan's population pyramid is now upside-down. The remarkable, and difficult, swing in Japan's population is the most extreme. In 1950, after WWII, 45% of Japan's population was under the age of 20. By 2050, 45% of Japan's population will be over the age of 60. Japan will have 15-20% of its population over 80 by 2050. Germany and Italy also have much older populations (though Germany has rapid productivity growth and the Syrian refugee crisis will alter the population projections across Europe).

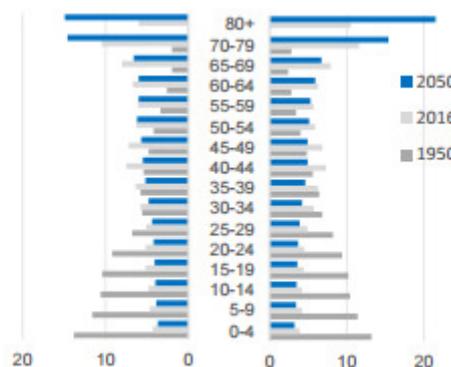
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We may all end of like Japan, eventually... But not over the next 50 years. The US, Australia and New Zealand have much younger populations (figures 21 to 23). The most important difference is immigration. Migrant flow can solve (or at least postpone) a lot of our "first world" problems.

The best work I have found on migration comes from Guy J. Abel, Nikola Sander, and Ramon Bauer

20. Japan's pyramid is inverted.



Source: US census bureau, CBA estimates

(<http://www.global-migration.info/>).

Figures 24 and 25

are the coolest charts ever created. I have borrowed them to hypnotise many audiences over the years. Figure 22 beautifully displays the world's migration flows in 2010-2015. Figure 23 has the largest flows.

North America attracts massive flow from Latin America, India, and China. African flow to the US is fourth. Most African flow remains on the continent. Most Asian flow also remains on the continent.

*Migration paths do not lead primarily from very poor to very rich countries, but rather adhere to a graduated model. People move to countries where the economy is somewhat stronger than in their native country... from Bangladesh to India or from Zimbabwe to South Africa. - Guy J. Abel.*