

# SPECIAL REPORT

## TD Economics



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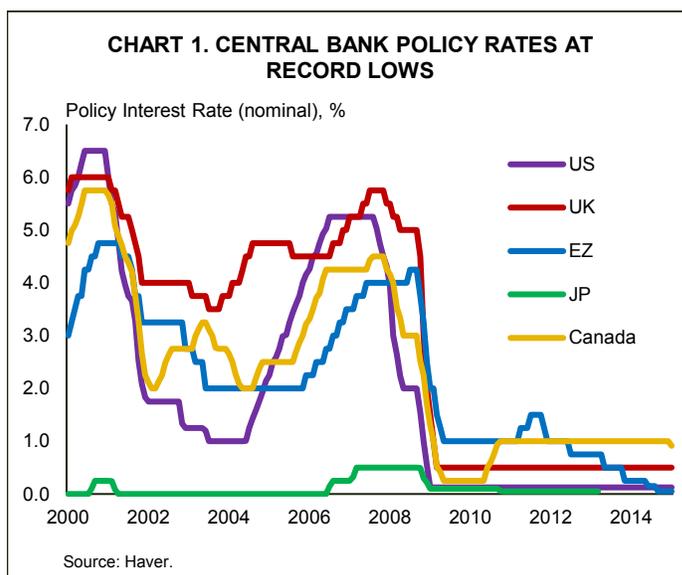
## THE NEW NORMAL: LOW RATES IN ADVANCED ECONOMIES FOR THE LONG RUN

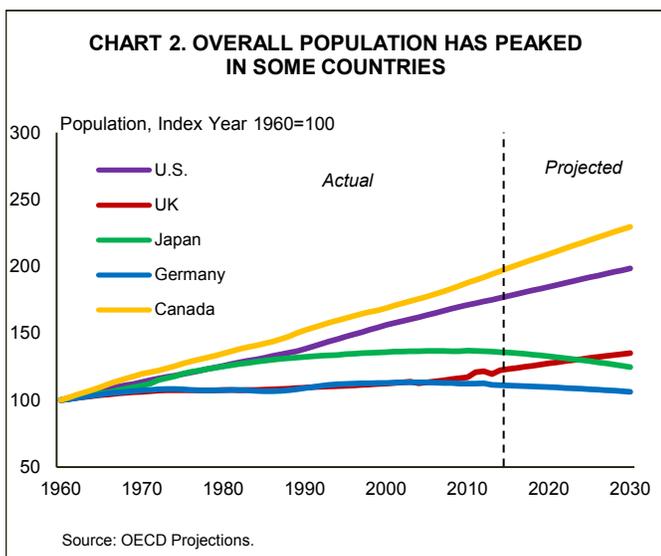
### Highlights

- Trend economic growth is likely to remain slower than it has been historically throughout advanced economies. The two key determinants, labor force and labor productivity growth, have been slowing nearly everywhere.
- Record low interest rates in many advanced economies is a result of both cyclical and structural factors. However, even once they begin to normalize, lower potential GDP growth will keep the long-term equilibrium level of interest rates lower than in the past. By extension, bond yields are also slated to be lower across the maturity spectrum.
- The equilibrium level of interest rates in the UK is set to be relatively similar to Canada's and slightly below that of the US. In the euro area, the equilibrium level will be a notch below the UK's, while it will be substantially lower in Japan.
- In the near term, it is perfectly clear that interest rates are set to remain far lower than their expected neutral level. Nonetheless, for long-term investors, such as pension funds, investing over multiple business cycles, lower neutral rates will make for a particular challenge.

While interest rates have been running at record low levels in many advanced economies, there is a fundamental question about whether this is a cyclical short-term issue or a longer-term structural change. The answer is a bit of both. Weakness in aggregate demand growth has meant that the economic recovery since 2009 has been sub-par and the risk of disinflationary forces has meant central banks have had to run unprecedentedly stimulative monetary policies. These cyclical forces imply exceptionally low rates in the near-term. A recovery in demand should eventually occur, and this will lead to higher policy rates and an upward shift in yield curves. However, it is also true that the long-term equilibrium level of interest rates consistent with trend economic growth and full employment will be lower than in the past.

In a recent [paper](#), TD Economics estimated the long-run neutral level of the federal funds rate to be 3.25%, relative to a 1992-2007 average of 4.10%, and the long-run neutral Bank of Canada overnight rate to be 3.00%, compared to an average of 4.20% over the same time frame. This decline reflects slower labor force growth and modest productivity growth. A central question is whether this is a global phenomenon? In this paper, we explore the long-run neutral level of interest rates for the UK, euro area and Japan. Our conclusion is that across the advanced





world, the long-term equilibrium level of interest rates will be lower than in the past.

From 1992 to 2007, the Bank of England Bank Rate averaged 5.60% in the UK, but we estimate that once the UK economy has normalized, the long-term equilibrium policy rate is set to be 3.00%. The euro area has worse fundamentals in terms of demographics and productivity growth; and, therefore, we anticipate a lower neutral rate of 2.50%. Note that given current economic circumstances, it could be a very long time before the European central bank's policy rate returns to a level considered normal. For Japan, where trend economic growth is even lower, the long-term equilibrium is unlikely to be higher than 0.75%. Since central bank policy rates anchor the yield curve, a key implication is that bond yields should remain dramatically lower than they have in the past, posing a challenge for savers.

### Economic growth has been on a downward trend across advanced economies

A country's potential GDP is the total output an economy could produce if it were making full use of its resources. While output can be either above or below its potential level over an economic cycle, over time, it will average a level of economic activity around that threshold.

Over this longer-term horizon, the rate at which an economy grows can be broken down into two simple components: the increase in the aggregate numbers of hours worked by labor (the labor input which includes the number of workers and their hours of work), and the increase in the productivity of labor during those hours, (labor productivity), as measured by GDP per hour<sup>1</sup>.

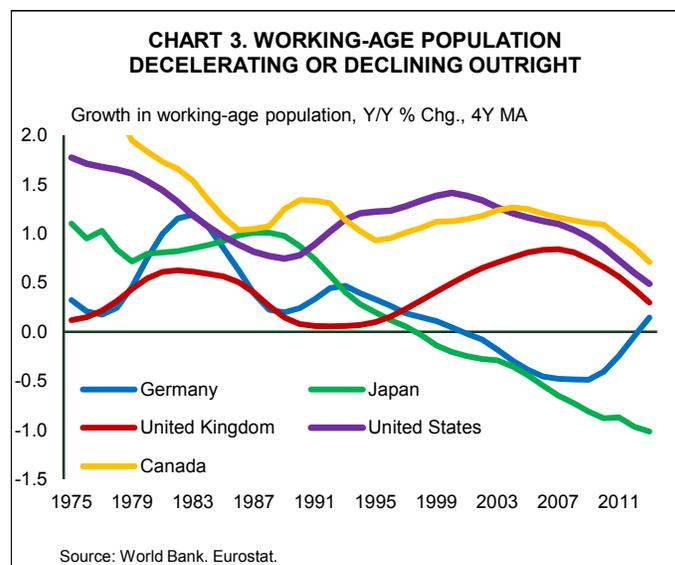
Across major advanced economies, the rate of potential real GDP growth has been slowing over the past several decades as a result of both diminishing labor force growth and generally slower labor productivity growth. This trend is set to continue to differing degrees across the advanced world.

### Labor force growth is slowing across much of the advanced world and outright declining in Japan

Population growth is slowing in the US, UK and Canada; but a number of other major economies are experiencing an outright decline in their populations (Chart 2). The overall population in Japan reached a peak in 2010, and is now declining. In Germany, the peak in population occurred in 2003 and was on the decline until the recent crisis, when in-migration from crisis-stricken euro zone members picked up. Slower population growth is generally the result of low fertility rates and insufficient immigration.

Beyond slower population growth, population aging will also weigh on labor's input to potential growth (Chart 3). The rate of growth of the working-age population – individuals aged 15-64 – is slower than that of the overall population across much of the advanced world. Nowhere is this trend currently worse than in Japan, where the working-age population has been in decline since 1996. Germany's working-age population peaked a few years later, in 2000, but a recent wave of in-migration has given pause to this trend. Nevertheless, the working-age population remains smaller today than in the 1990s. The UK, Canada and the US maintain an expanding working age population, but dramatically slower than the past.

Population aging would generally cause the economy-

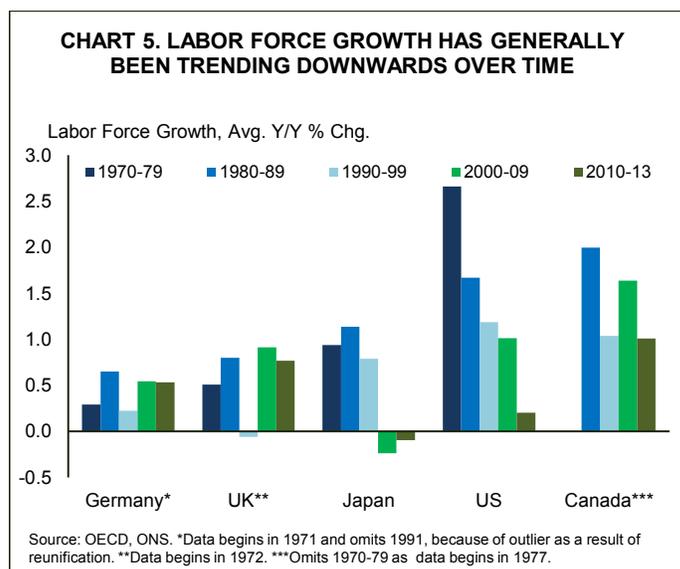
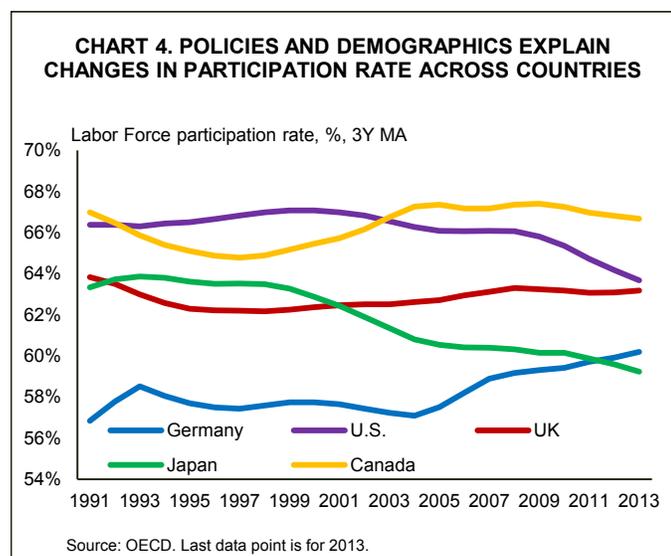


wide participation rate in the labor force to fall, however, the impact can be offset by rising labor participation rates within the various age groups, particularly among older workers. Indeed, countries such as the UK and Germany have experienced exactly this. In the case of Germany, labor market reforms introduced in 2003 have encouraged more workers to participate in the job market, helped along by robust economic activity and a tightening labor market. In contrast, America has experienced a steeper decline in its participation rate relative to peers (See Chart 4).

For Japan, the overall labor force participation rate for individuals aged 15+ was 59.3% in 2013, which is relatively similar to the OECD average of 60.1%<sup>2</sup>. However, the participation rate for women is lower than the OECD average (48.8% vs 51.6%), and is much lower than in Canada, Germany, the US and the UK, which all have a female participation rate of 54.6% or higher. Therefore, Japan could offset some of the negative impact of poor demographics through a greater participation rate for women, which is one of the planks of Abenomics's reform agenda but will take some time to have an effect even if it is successful.

Nonetheless, there are likely to be limits to the extent for which higher participation rates can offset decelerating growth in the working-age population, particularly if absolute population levels are declining, as is the case in Japan. As a result, labor force growth generally remains on a decelerating trend (see Chart 5).

Finally, across the advanced world, the average annual number of hours worked per worker has been stable or slowing over time (See Chart 6). This suggests that average hours worked is unlikely to provide a meaningful contribu-

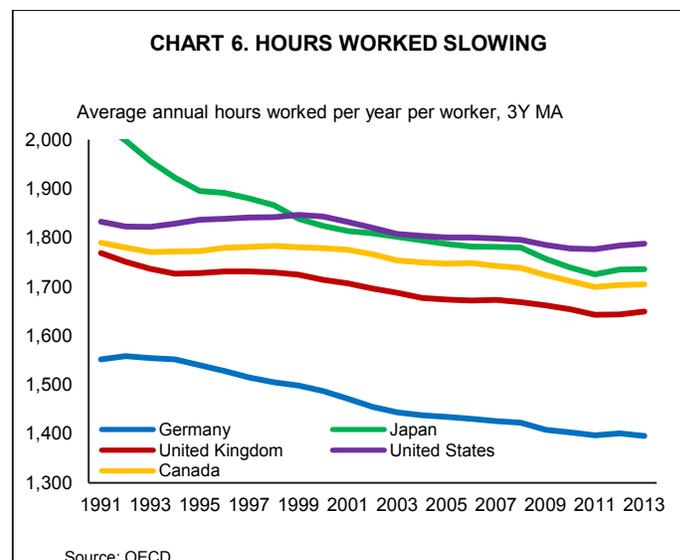


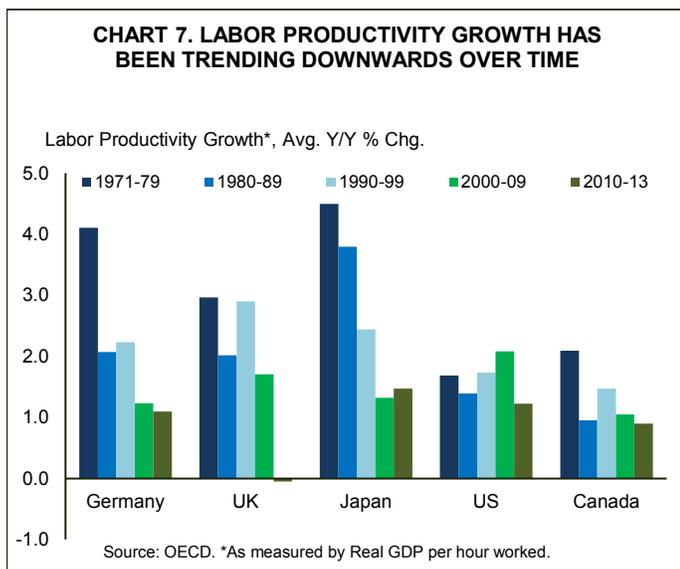
tion to labor input growth as a counter influence to weaker labor force growth.

The end result is that labor's input to potential growth is set to decelerate to various degrees in advanced economies. The country in the most difficult position is Japan, where the contribution is expected to be negative. Canada, the UK, the US and Germany are in better shape. However, the contribution in Germany is currently positive owing to positive migration flows, and this is unlikely to be sufficient to prevent a rapid deceleration at the end of the decade, as population aging comes to dominate.

### Labor productivity growth has decelerated

The other side of the coin for potential GDP growth is labor productivity. Although other countries, particularly





certain emerging markets, have higher productivity growth rates, in absolute level terms, the US is generally considered the Gold Standard. Several decades ago, productivity growth in other advanced economies was far higher than it is today, as their economies caught up to America's technologically. In recent decades, productivity growth across advanced economies has slowed, as the low-hanging fruit was plucked, reflecting a convergence in technological and educational advances (See Chart 7).

In recent years, productivity growth has weakened in a number of countries. This is partly a result of lower investment rates, as subdued demand has limited the need to expand capacity across industries. There are hopes that as advanced economies shake off the post-financial crisis torpor, investment will rise, but the balance of evidence leans more to the view that productivity growth will not be as strong as in past decades. This is partly due to its negative relationship with population aging<sup>3</sup>. Furthermore, the productivity gains from the IT revolution may diminish with time, reflecting slower advancements in the pace of technological computing development, greater economies of scale through "cloud" services, and less capital required by today's startups relative to the past. For more information, we explore these elements in greater detail in a report entitled "[The Lost Years: U.S. Business Investment Poised For Better Days](#)".

The most likely scenario is one in which productivity growth remains relatively subdued across countries. And, this signifies slower potential real GDP growth.

**TABLE 1. AVERAGE ACTUAL REAL GDP GROWTH AND ESTIMATES OF POTENTIAL GROWTH**

Y/Y % Chg.	Germany		UK		Japan	
	Actual	Potential	Actual	Potential	Actual	Potential
1980-89			2.6	3.1	4.6	4.1
1990-99	2.2	2.1	2.1	3.1	1.4	2.0
2000-09	0.8	1.5	1.9	2.4	0.6	0.8
2010-13	2.0	1.4	1.5	1.2	1.8	0.6

Source: TD Economics, Haver Analytics.  
Potential growth rate is average of OECD, IMF and TD Economics estimates.

### Slower potential growth points to lower policy rates

When you put together the two pieces, they reveal more subdued potential GDP growth in advanced economies relative to the past (see Table 2). This is particularly true in Japan and Germany, which have a more challenging demographic backdrop. Potential GDP growth in Japan will likely fall to 0.9%, from a 1990-2009 average of 1.4%, while it is expected to fall to 1.2% in Germany, from a 1990-2009 average of 1.8%. For the euro area as a whole, labor's contribution to growth is expected to be greater than Germany's, while productivity growth is expected to be slower. As a result, the euro area's long-term potential growth is likely to be marginally higher than Germany's at 1.3%, compared to a historical average of 1.9%<sup>4</sup>. For the UK, potential GDP growth will likely fall to 1.9%, from a 1990-2009 average of 2.7%. This is roughly in line with America, where in a recent [paper](#), we estimated potential GDP growth to have fallen to 2.0% from a 1990-2009 average of roughly 3.1%.

This will have implications for interest rates. The neutral rate of interest is the policy rate that a central bank would

**TABLE 2. POTENTIAL REAL GDP GROWTH ESTIMATES**

Y/Y % Chg.	2014	2015	2016	2017	2018	L-T*
	<b>JAPAN</b>					
Potential Real GDP	0.6	0.6	0.8	0.8	0.9	0.9
Labor Input	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4
Labor Productivity	1.1	1.1	1.2	1.2	1.3	1.3
	<b>GERMANY</b>					
Potential Real GDP	1.5	1.5	1.4	1.4	1.3	1.2
Labor Input	0.4	0.4	0.3	0.2	0.1	0.0
Labor Productivity	1.1	1.1	1.1	1.2	1.2	1.2
	<b>UK</b>					
Potential Real GDP	1.7	1.7	1.7	1.8	1.9	1.9
Labor Input	0.6	0.5	0.4	0.4	0.4	0.4
Labor Productivity	1.1	1.2	1.3	1.4	1.4	1.4

Source: TD Economics. \*Long-term

have when the economy is at full employment and inflation is stable at its desired target. However, the neutral rate is not something the central bank directly controls. Rather, the neutral rate is determined by the supply of funds (desired saving) relative to the demand for funds (desired investment). When the desire to save is greater than the desire to invest, for example due to a shock that causes a rise in risk aversion, then the neutral rate will be lower. In the long run, savings will equal investment at the neutral rate of interest.

With a lower rate of trend economic growth, standard economic theory suggests that investment demand will be lower and the desire to save will be higher<sup>5</sup>. This would push down the neutral rate, and it occurs through two ways. First, the decision to undertake investment is determined by its expected rate of return (after adjusting for the inherent risks involved). A lower economic growth rate implies a lower rate of return for investment projects across the economy and, therefore, lower investment demand. Second, lower trend economic growth implies less income growth in the economy, which lowers the savings that funds investment. However, it also encourages more savings by households from current income in anticipation of weaker future income growth.

One definition of the neutral interest rate is the time-varying neutral rate concept described in Laubach and Williams 2001<sup>10</sup>. This time-varying neutral rate, once estimated, provides a benchmark against which the current central bank policy rate can be evaluated. If the central bank policy rate is below the time-varying neutral rate, then monetary policy is said to be stimulative, and vice-versa. In the aftermath of the financial crisis, the time-varying real neutral

### Textbox: A Counterview to Lower Neutral Rates

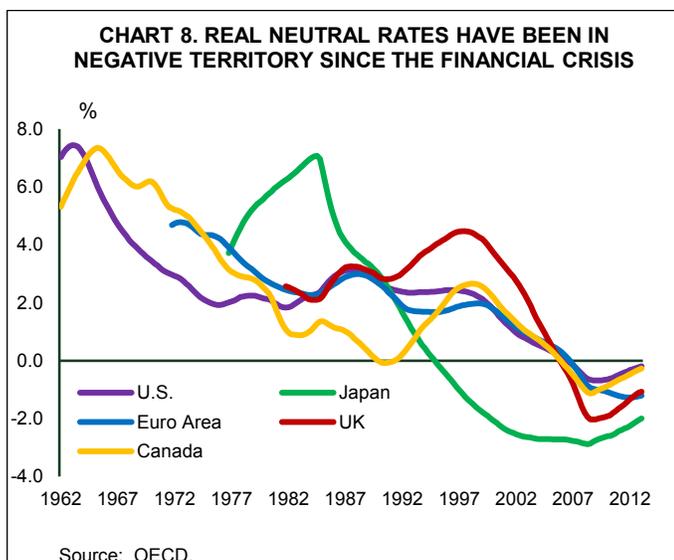
Standard economic theory suggests that a lower potential economic growth rate would push down the neutral real level of interest rates. Institutions and policymakers (including the CBO, some FOMC participants, as well as individuals from other central banks such as the Bank of Canada) have used this argument to lower their own interest rate projections.

Although this appears to be the consensus opinion, there has been some debate about the validity of this argument. A recent San Francisco Fed paper<sup>6</sup> disputes this view and suggests that it may be the interaction of growth, saving and investment at a global level, rather than developments in any single country, that determine the real interest rate. One of the links between lower trend growth and lower real interest rates is that it depends in part on a rise in the savings rate. However, there is empirical evidence that countries with rising economic growth witness a rise in their savings rates. If the opposite also holds, then slower economic growth would reduce investment demand, but this would be offset in part by a lower savings rate. The implication of this argument is that there is an upside risk to downwardly-revised projections of long-term interest rates.

While there is some merit to the argument<sup>7</sup>, it isn't clear that slower economic growth leading to a lower savings rate would dominate the decline in investment demand. For instance, lower investment demand appears to have been the prime reason for the decline in global interest rates in the years leading to the financial crisis, rather than a relative increase in desired global savings<sup>8</sup>.

Nonetheless, global patterns in savings and investment do appear to have an impact on the neutral rate within individual countries<sup>9</sup>. Therefore, these should be monitored as any large shifts would have an impact on neutral estimates provided here.

rate (adjusted for inflation) has been substantially negative in some advanced economies (see Chart 8), meaning that central banks policy rates would need to be even lower in order to stimulate the economy. With central bank policy rates near zero and with an inflation target of 2%, central banks were unable to lower the real interest rate below the neutral rate sufficiently to stimulate the economy. This is why even with central bank policy rates at very low levels, real GDP growth has failed to take off. For this reason, additional monetary stimulus was undertaken to various degrees through unconventional monetary policy across much of the advanced world.



One interesting element is the fact that Japan's neutral rate has been negative for much longer than the other countries. In fact, its neutral rate has been negative since its economy first went into deflation in the mid-90s. This argues for very aggressive monetary policy beginning in 1995. Yet, even with Japan's central bank rate at zero for much of the last 20 years, negative inflation has resulted in a positive actual real rate, which acted as a counterweight to stimulating the economy. This demonstrates some of the perils and additional challenges of operating in a deflationary environment.

The circumstances leading to extremely low real neutral rates are unlikely to persist indefinitely. They are a consequence of the bursting of asset bubbles during the financial crisis and the slow recovery afterwards, which has limited investment and led to greater precautionary savings. As the scars from the financial crisis recede, the time-varying neutral rates are expected to rise. However, in the long-run, neutral rates are likely to remain lower than in the past, due to slower long-run potential economic growth rates.

### Long-term neutral rate is also lower

Using the same time-varying neutral rates shown in Chart 8, we examined the historical relationship between potential GDP growth and an economy's neutral rate, for the period up until the financial crisis<sup>11</sup>. We then computed an estimate of the long-term equilibrium rates that one would expect given our estimates of potential GDP (See table 3).

The UK is estimated to have a long-term real neutral rate of 1.00%, on par with the estimate for Canada and a bit below that in the United States. In contrast, the euro area is likely to have a lower real neutral rate of 0.50%. Assuming an inflation rate of 2%, this would imply a nominal policy rate of roughly 3.00% in the UK and 2.50% in the euro

area. This indicates that even once the euro zone economy has recovered, bond yields are likely to remain lower than those in America.

For Japan, where the central bank policy rate has been near 0% for much of the past 20 years, assessing a long-term neutral rate is exceedingly difficult and remains a highly uncertain exercise. This is all the more so as the success (or not) of their current monetary policy experiment remains up in the air. That being said, the long-term real equilibrium rate was estimated to be -1.00% to -1.50%. This suggests that even as Japan's economy recovers and even should its inflation target of 2% be reached, the nominal policy rate is likely to remain below 1% and could remain close to zero.

### Conclusion

Subdued labor productivity growth, along with a deceleration in labor input growth, suggests that potential GDP growth in advanced economies will be lower than in the past. In spite of the differences between advanced countries, all have one thing in common: Neutral rates will be lower relative to their own history. By extension, bond yields are also slated to be lower across the maturity spectrum. Moreover, a lower natural resting place for global policy rates raises the risk that an economic shock will push them back to the zero lower bound. In the absence of lifting inflation targets to allow nominal growth to run faster, the likelihood that unconventional monetary policies become a new norm in recessionary periods will remain elevated.

For investors, slower trend economic growth implies slower trend growth in corporate profits. All else equal, this suggests equity returns will also be lower than in the past. However, lower fixed income yields can provide a partial offset, as equities will look more attractive on a relative asset return basis.

In the near term, it is perfectly clear that interest rates are set to remain far lower than their expected neutral level in the euro zone and Japan, and therefore this analysis has more near-term relevance for the UK. Nonetheless, for long-term investors, such as pension funds, investing over multiple business cycles, the neutral rates can serve as a guide of short term interest rates in the long-run. Lower neutral rates will make meeting pension obligations a particular challenge.

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Average rate (%)	U.S.	UK	Euro Area	Japan	Canada
<b>Real*</b>					
2000-07	0.7	3.2	0.9	0.4	1.2
2008-2014	-1.5	-1.9	-0.5	-0.1	-0.5
Long-term Neutral	1.0-1.5	0.75-1.25	0.25-0.75	-1 to -1.5	0.75-1.25
<b>Nominal</b>					
Long-term Neutral	3.0-3.5	2.75-3.25	2.25-2.75	0.5-1.0	2.75-3.25

Source: TD Economics. \*Obtained by deflating the nominal policy rate by CPI.  
L-T Neutral is estimated by subtracting assumed 2% inflation from the nominal rates.

## End Notes

1. In turn, labor productivity can be broken down into growth in the level of capital per worker, and growth in total factor productivity (TFP), which corresponds to technological innovation or efficiency.
2. OECD Labor force statistics.
3. Charles M. Beach, “Canada’s Aging Workforce: Participation, Productivity, and Living Standards”, Bank of Canada, <http://www.bankofcanada.ca/wp-content/uploads/2010/09/beach.pdf>
4. Average for euro area is for 1992-2009, as historical data is limited.
5. While economic theory implies that lower potential growth would mean lower rates of interest, there is some debate about whether this relationship holds empirically. See box.
6. FRBSF Economic Letter, “Does Slower Growth Imply Lower Interest Rates?”, Leduc and Rudebusch, November 10, 2014. <http://www.frbsf.org/economic-research/publications/economic-letter/2014/november/interest-rates-economic-growth-monetary-policy/>
7. IMF, “Perspectives on Global Interest Rates”, April 2014, <https://www.imf.org/external/Pubs/ft/weo/2014/01/pdf/c3.pdf>
8. Brigitte Desroches and Michael Francis, “World Real Interest Rates: A Global Savings and Investment Perspective”, Bank of Canada Working Paper 2007-16, <http://www.bankofcanada.ca/wp-content/uploads/2010/03/wp07-16.pdf>
9. For further discussion, see: Rhys R. Mendes, “The Neutral Rate of Interest in Canada”, Bank of Canada Discussion Paper 2014-5, <http://www.bankofcanada.ca/wp-content/uploads/2014/09/dp2014-5.pdf>
10. Laubach and Williams, “Measuring the Natural Rate of Interest”, Board of Governors of the Federal Reserve System, <http://www.federalreserve.gov/pubs/feds/2001/200156/200156pap.pdf>
11. The methodology used is as follows: we regressed the neutral rates on potential GDP growth using ordinary least squares. The historical potential GDP growth rates used were an average of TD, IMF and OECD estimates. For each country, the time period chosen starts once estimates of potential growth and the neutral rate become available, and go until 2006. Subsequently, TD estimates of potential are multiplied by the coefficient in order to arrive at a long-term equilibrium neutral rate.

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