ARTICLE – The repo rate in the long run

In a small, open economy like Sweden, domestic interest rates are very much influenced by international events. In recent decades, both nominal and real interest rates have shown a falling trend all over the world. Global factors that may explain this development include structural trends that influence saving and investment, and cyclical factors linked to the financial crisis and the euro crisis. The global recovery after the financial crisis has been ongoing for a long time and inflation is rising, which raises the question of where interest rates abroad and in Sweden are heading in the long run. The structural factors that have contributed to the fall in interest rates in recent decades are, to some extent, expected to continue to hold down rates in the period ahead. The Riksbank's overall assessment is that the repo rate can be expected in the long run to be between 2.5 and 4.0 per cent, which is lower than the previously published interval. The Riksbank's forecast means, however, that the repo rate will be considerably lower than the long run normal level in the coming years.

Rates have been falling for a long time

Global interest rates have been showing a falling trend in recent decades and even though nominal rates in particular have seen a slight rise recently, both nominal rates and real rates are historically low (see figure 1:13). Some of the explanation for the current low rates can be attributed to structural trends that are not primarily affected by economic activity but other trends are cyclical and linked to the international financial crisis and the European debt crisis. Studies show that deep and long economic downturns can have long-term effects and it can therefore be difficult to distinguish structural trends from cyclical ones.

The trend in real interest rates is determined by structural factors while the trend in nominal rates is also affected by inflation expectations. Up until the mid-1990s, the decline in nominal rates was partly driven by a fall in inflation expectations in many countries. Thereafter, inflation expectations have remained relatively stable and it is instead other factors that have pushed down real rates and consequently nominal rates as well. Real rates have fallen in both advanced economies and emerging market economies, which suggests that global factors are behind the development.

It is primarily real rates that should influence investment and consumption decisions.[5] The Riksbank and other central banks have therefore had to adapt to the falling trends in real rates and cut their policy rates to very low, and in some cases negative, levels in order to stimulate demand and push up inflation.

The low level of interest rates despite the long ongoing recovery after the financial crisis and recent rises in inflation raise the question of where interest rates abroad and in Sweden are heading in the long run. But in order to form an opinion on how interest rates will develop in the period ahead, it is important to firstly understand the factors that lie behind the decline in real rates.

What determines the interest rate in the long run?

How real interest rates develop in a longer time perspective is determined by factors that influence saving and investment. In the long run, these are factors that are beyond the control of central banks. For a small, economy like Sweden, domestic rates are largely influenced by international events, assuming, at least, that the domestic economy is in good order. Weak public finances, long-term deficits in the current account or a domestically generated financial crisis are factors that can cause domestic interest rates to deviate from those abroad for a relatively long time.

The share of global GDP made up of global saving and investment has long remained relatively unchanged (see figure 1:17). In order to explain simultaneously falling interest rates, it is therefore logical to try to find factors that have increase people's desire to save and reduce their desire to invest.

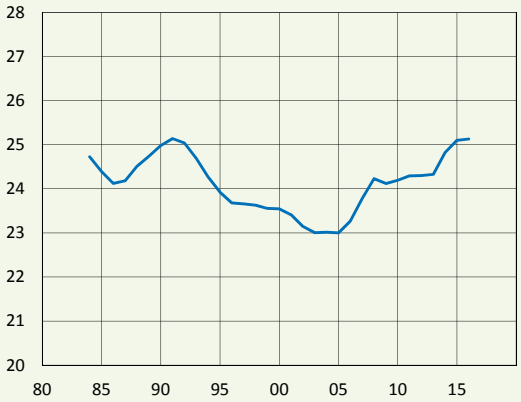
In several studies, demographic changes have been identified as an important explanations for the decline in interest rates.[6] One argument is that saving is at its highest during the years a person is professionally active. In the world as a whole, the percentages of younger and older people in

[5] A household's decision to consume today or to save until a certain nominal rate in order to consume later on depends partly on the volume of goods and services it can consume at the two different junctures. In order to make this comparison, the household needs to consider expected price changes. As the real rate is defined as the nominal rate minus expected inflation, it is hence this interest rate that becomes the relevant factor in the household's decision. The same principles apply for companies choosing between making an investment or refraining from doing so.

[6] Rachel, L. and Smith, T. (2015), "Secular drivers of the global real interest rate", Staff Working Paper No. 571. Bank of England. Carvalho, C., Ferrero, A. and Nechio, F. (2016), "Demographics and Real Interest Rates: Inspecting the Mechanism", Working

the population have declined since the end of the 1960s up until a few years ago (see figure 1:18).

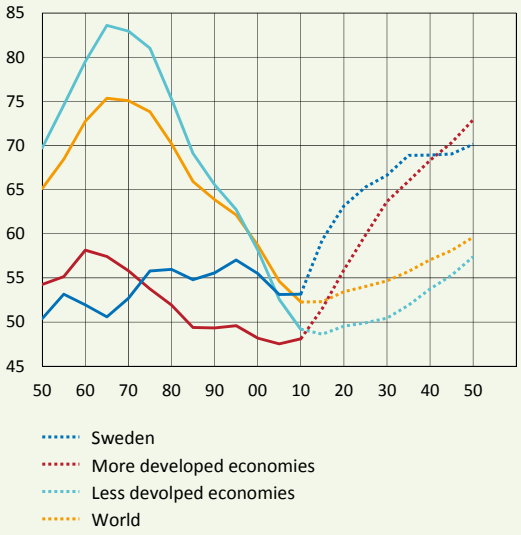
Figure 1:17. Global investments
Per cent of GDP



Note. Current prices, 5 years moving average.

Source: IMF

Figure 1:18. Young and elderly as share of the population
Per cent



Note. The population in age groups 0-14 years and the 65 years as a percentage of the population aged 15-64. Data is 5 year frequency and the observation for 2015 is an estimate.

Source: United Nations

This shift in the composition of the population towards a greater proportion of people in age groups that work and save has contributed to an increase in total saving propensity. The fact that people are also living longer also means that saving needs to increase during working life, assuming an unchanged retirement age. At the same time, population growth in the world has declined as has growth in the labour force, albeit with a certain time lag. And when the labour force increases more slowly, investment in capital stock does not need to grow as rapidly as before either.

Saving is also affected by income spread within countries as individuals with higher incomes are more inclined to save than individuals with low incomes. Greater income gaps in several countries may therefore have caused an increase in total saving propensity. Income growth in emerging market economies may also have helped to increase people's scope for saving. Finally, there has also been a rise in precautionary saving in the public sector in many emerging market economies in the wake of the Asian crisis of 1997–1998, when central banks and others built up their foreign currency reserves in order to be able to cope with large capital outflows.

The decline in real rates can also be explained by various factors that dampen the desire to invest. Lower expected growth as a result of slower technological development or weaker growth in the labour force subdue the need to invest. Several other explanations have also been highlighted. The price of capital goods has fallen in relation to the price of consumption goods, which may cause investment propensity to decrease. Public sector investment as a share of GDP has been falling for a long time, which might be explained by the decline in political support for such investment. Finally, the gap between the interest rates paid by companies and government bond yields has increased. And as a result, the desire to invest at a given risk-free interest rate level has fallen.

Most international studies agree that the combination of the abovementioned factors can explain much of the decline in interest rates since the mid-1990s even if the studies differ as regards the relative significance of each individual factor.[7]

Strong indications that the long run global interest rate has fallen

Even if assessments differ, international studies consistently indicate that the long-term, more normal, level of the real interest rate is currently much lower than previously. Many studies conclude that, in the long run, the real interest rate will probably be around 1 per cent or even lower. Given inflation expectations of about 2 per cent, this would correspond to a nominal rate of around 3 per cent. This development is not limited to advanced economies. Indeed, assessments of what a long run, normal rate is have also

Paper 2016-05, Federal Reserve Bank of San Francisco. Gagnon, E., Johanssen, B.-K. and Lopez-Salido, D. (2016), "Understanding the New Normal: The Role of Demographics", Finance and Economics Discussion Series 2016-080, Board of Governors of the Federal Reserve System.

[7] Holston, K., Laubach, T. and Williams, J.C. (2016), "Measuring the natural rate of interest: international trends and determinants", Working Paper 2016-11, Federal Reserve Bank of San Francisco. Rachel, L. and Smith, T. (2015), "Secular drivers of the global real interest rate", Staff Working Paper No. 571, Bank of England. Hamilton, J.D., Harris, E.S., Hatzius, J. and West, K.D. (2015), "The Equilibrium Real Funds Rate: Past, Present, and Future," US Monetary Policy Forum, New York. Constâncio, V. (2016), "The challenge of low real interest rates for monetary policy," Vice-President ECB speech on 15 June.

indicated a falling trend in many emerging market economies in Asia.[8]

As it is a question of a global trend in interest rates, several central banks have adjusted their assessments of their own economy's long run, normal rate downwards. The members of the US central bank monetary policy committee have successively revised their median assessment downwards from 4.25 per cent in 2012 to 3.0 per cent in December 2016.[9] The Canadian central bank has also revised its assessment downwards from 5.25 per cent in the mid-2000s to 3.25 per cent (± 0.5 percentage points).[10] Norway's central bank expects the "neutral nominal market rate" to be in the interval of 2.5–3.5 percent in a few years' time.[11]

The Riksbank has reviewed its assessment a number of times in recent years

Changes are constantly occurring in the economy that affect long run interest rate developments. On a number of occasions over the last ten years, the Riksbank has therefore reviewed its interval for the long-term repo rate level. The longer-term level can, in this context, be interpreted as the level the repo rate is expected to reach in 5–10 years' time, in a situation deemed to be cyclically normal. In June 2006, an analysis based on historical real interest rates and growth in Sweden and abroad concluded that the long run repo rate would probably be within the interval of 3.5–5.0 per cent.[12] In 2010, this analysis was followed up with the conclusion that the rate would more likely be within the interval of 3.5–4.5 per cent.[13] The question came to the fore again in 2014 when the forecast for the repo rate was significantly lower than the interval despite the Swedish economy being deemed more or less in balance at the end of the forecast period, with a CPIF inflation rate close to the target. The conclusion then was that it was still too early to determine the extent to which the low global interest rates reflected cyclical or more long run factors. But the assessment was that rates would be low for a long time.[14] This assessment has been reflected in the published repo rate paths since then.

The long run repo rate in the light of historical growth and historical interest rate levels

The period since 2008 has been strongly characterised by the financial crisis and the euro crisis, which means that it is difficult to determine whether historical averages actually provide a snapshot of a normal economic situation. As is clear from table 1:1, actual average GDP growth per capita since 2008 has fallen slightly further and the decline in short-term real interest rates, which have been around 2 per cent on average since the 1960s, has been reinforced.

Tabell 1:2. Growth, and nominal and real interest rates
Per cent

	1960-2008	1998-2008	1998-2016***
GDP growth per capita			
Sweden	2.3	2.7	1.9
Abroad*	2.1	2.0	1.5
Nominal 3-month rate			
Sweden	6.8	3.3	2.2
Abroad*	6.9	4.4	3.1
Real 3-month rate**			
Sweden	1.7	1.9	1.1
Abroad*	2.4	2.2	1.1

*Average for Australia, Canada, Germany, the UK and the US. The time series for rates start at different times for the various countries.

**The rate for treasury bills with 3-month maturity minus actual inflation.

***GDP per capita data available up to 2015.

Sources: OECD, Macrobond, World Bank and the Riksbank

Market participants' view of the long run repo rate

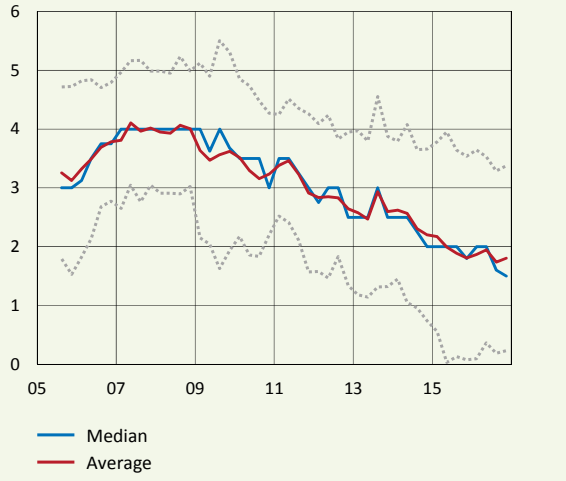
Forward-looking information from financial markets shows that participants expect rates to remain low in the period ahead. Expectations of the repo rate level five years ahead, as expressed in Prospera's survey, have fallen from about 4 per cent at the end of 2009 to just under 2 per cent in the past year (see figure 1:19). At the same time, inflation expectations have been around 2 per cent. Of course, five-year expectations don't necessarily have to tally with even longer-term expectations.

A complement to surveys is the market's pricing of future interest rates. Nominal and real forward rates five years ahead, i.e. current market prices at overnight rates in five years' time, have continued to fall after 2009 (see figure 1:20).[15] Forward rates consist of two components – an expectation of future, short-term interest rate and a forward premium. There is every indication that the forward premium has been lower than its historical average for some time and certain surveys suggest that it may even be negative.[16] Estimating forward premiums is associated with major uncertainty, but adjusted for an estimation of these premiums, forward rates indicate that

[8] Zhu, F. (2016), "Understanding the changing equilibrium real interest rates in Asia-Pacific", BIS Working Papers No 567.
[9] Federal Reserve FOMC (2016), "Summary of Economic Projections", December.
[10] Bank of Canada (2016), Monetary Policy Report, July.
[11] Norges Bank (2016), "The neutral real interest rate globally and in Norway", Monetary Policy Report, September. The measure refers to the "neutral market rate" which is normally slightly higher than the corresponding measure for their policy rate.
[12] Sveriges Riksbank (2006), "What is a normal repo rate?", Inflation Report 2006:2.
[13] Sveriges Riksbank (2010), "What is a normal repo rate?" February Monetary Policy Report.
[14] Sveriges Riksbank, (2014), "Lower global interest rates", October Monetary Policy Report.
[15] A forward rate is the price of a contract that obliges the contracting parties to complete a purchase or sale of an interest rate asset at a predetermined interest rate, the forward rate, where the actual transaction then occurs on a predetermined date in the future. The forward rate is a contract reflecting market participants' expected interest rate level during the forward contract's maturity period but also contains a risk premium.
[16] Adrian, T., Crump, R.K. and Moench, E. (2013), "Pricing the term structure with linear regressions", Journal of Financial Economics 110 no 1.

the expected short-term rate five years ahead has been around 1.5 per cent in recent years.

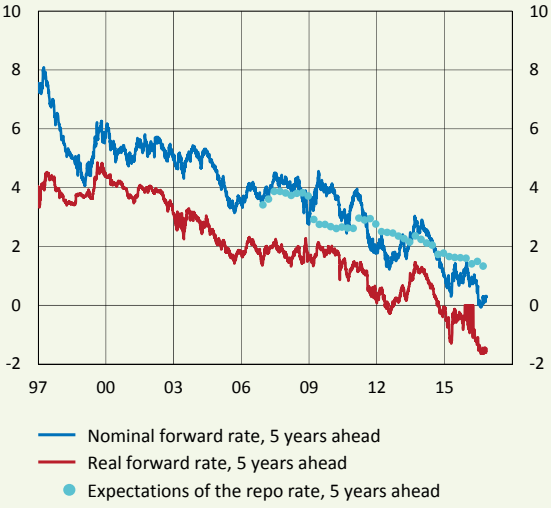
Figure 1:19. Market participants' expectations about the level of the repo rate in 5 years
Per cent



Note. Survey responses between June 2005 and November 2016. Broken grey lines represent +/- 2 standard deviations and illustrates the spread of the responses.

Sources: TNS Sifo Prospera and the Riksbank

Figure 1:20. Nominal and real forward rates, 5 years ahead
Per cent



Sources: TNS Sifo Prospera and the Riksbank

The financial and debt crisis makes the assessment more difficult

The past few years have largely been characterised by repercussions from the financial and sovereign debt crisis. An assessment of what is a long-term normal repo rate should hence not only be based on historical growth rates and interest rate levels or forward-looking information from financial markets. It is also very difficult to know how the factors that had already subdued interest rates prior to the financial crisis will develop. The demographic trend with an ageing population and a falling share of people of working age in the period ahead should gradually contribute to high interest rates (see figure 1:18). Opinions are divided, however, as to when this turnaround in the effect of demography on saving and interest rates may occur. Some believe that it will happen relatively soon while others think it may take a while. The latter highlight factors such as the increase in the labour force participation rate among older people, and particular among wealthy older people who normally have a relatively high propensity to save.[17] Based on a thorough analysis, Rachel and Smith (2015) make the assessment that the structural factors contributing to lower interest rates will largely persist, and global long-term real rates up until 2030 are expected to be around 1 per cent on average.[18]

The long run repo rate interval is expected to be 2.5-4.0 per cent

As the global economy recovers and the effects of the financial and debt crisis gradually wear off, interest rates are expected to rise. However, structural factors are expected to continue to contribute to interest rates abroad, and hence also in Sweden, being lower than they were before the financial crisis. The Riksbank's overall assessment is that the repo rate can be expected in the long run to be between 2.5 and 4.0 per cent. This assessment is in line with those made by other central banks and analysts of international long-term rate levels. The Riksbank's previously published interval of 3-5–4.5 per cent was in part based on historical real interest rates and growth. An update of these factors also indicates that the long-term interest rate level has fallen by around 1 percentage point. Recent interest rate levels have been influenced by weak economic activity and may therefore provide limited guidance on future developments.

According to the Riksbank's forecast, the repo rate will be very low in the coming years (see figure 1:10). The nominal repo rate is expected to amount to 0.5 per cent at the beginning of 2020, which is much lower than the long run normal level. This is due to the expectation that, in the wake of the crises over the past ten years, the global economic recovery will be relatively slow and that monetary policy therefore needs to be expansionary for a longer period of time both abroad and in Sweden.

[17] Goodhart, C. and Erfurth, P. (2014), "Demography and economics: Look past the past". Tracey, M. and Fels, J. (2016),"70 is the New 65: Demographics Still Support Lower Rates for Longer", PIMCO.

[18] Rachel, L. and Smith, T. (2015), "Secular drivers of the global real interest rate", Staff Working Paper No. 571, Bank of England.