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EDITORIAL

ECB to continue highly accommodative monetary policy

30 MAR 2017 11:00 AM • BANK OF FINLAND BULLETIN 1/2017 • EDITORIAL

Economic growth in the euro area is becoming more broadly based and there has already been four years of unbroken growth in GDP. The monetary policy of the ECB has been highly accommodative, lowering funding costs for both households and non-financial corporations across the euro area. Bank lending rates are at a historical low, which has strengthened credit growth. With lower unemployment and higher household incomes, confidence in future economic developments in the euro area is high. The accommodative monetary policy has buffered euro area growth against negative impacts from the growing global uncertainty, supported balance sheet restructuring in the financial sector and contributed to a reduction in leverage ratios.

Monetary policy transmission is also supporting domestic demand. Improvements in corporate profitability are contributing to a recovery in investment. With signs of somewhat stronger global economic growth and a pick-up in global trade, the positive economic growth is expected to continue. Global economic growth is expected to average just over 3% in the coming years.

Euro area inflation has increased to close to 2% mainly on account of oil prices, and at the same time risks of deflation have been waning. Nevertheless, there is still unutilized capacity in the economy, and wage growth remains moderate. With inflation expectations remaining low, there is little sign of higher inflation in the medium term. A very substantial degree of monetary accommodation is still needed in the euro area for

underlying inflationary pressures to build up and support headline inflation in the medium term.

Risks to the outlook for both growth and inflation are tilted on the downside, and in particular uncertainty relating to global economic developments has increased. It is therefore crucial to fully implement the monetary policy measures decided earlier.

The Governing Council of the ECB consequently confirmed in March that it intends to continue non-standard policy measures until the end of December 2017, or beyond, if necessary, and in any case until it sees a sustained adjustment in the path of inflation consistent with its inflation target.

It should also be noted that with continuing economic growth in the euro area, inflation could increase markedly. Nevertheless, only a temporary increase in inflation would not be sufficient from the point of view of price stability. There needs to be a sustained adjustment in the path of inflation consistent with the price stability objective; a mere passing increase in prices is not enough. Inflation must also be self-sustaining so that price developments remain in line with the objective even after the current highly accommodative monetary policy stance is no longer in place. The price stability objective is defined for inflation in the euro area as a whole. Sizable country differences in inflation can be consistent with the objective and could help reduce differences in competitiveness in a situation where economies in the euro area are recovering from a protracted period of crisis, each at its own pace.

The euro area yield curve has recently steepened, with short-term interest rates falling and long-term rates rising. It is key for monetary policy to ensure that economic growth is not hampered by a strong and premature rise in long-term interest rates before growth has had a chance to become sufficiently self-sustaining.

The outlook for the Finnish economy has been improving, but economic growth in Finland is still forecast to remain below the euro area average. Like other euro area countries, Finland is benefiting from the accommodative monetary policy stance. Stronger economic growth in the euro area and globally means that Finnish exports will also pick up. Finnish economic growth remains moderate compared with pre-crisis levels, but the composition of growth is broadening. Private consumption and investment continue to support economic growth, while the importance of net exports is set to increase.

Weak cost-competitiveness was one element behind the exceptionally large contraction in Finnish exports since 2008. In the past few years, however, the weakening trend in cost-competitiveness has come to a halt as the rise in Finnish income levels has decelerated and the external value of the euro has depreciated. The Competitiveness Pact that entered into force at the beginning of 2017 is forecast to bring about tangible improvements in cost-competitiveness. For exports and employment growth, it is key for unit labour cost developments to remain below those of trading partners in the coming years, even after the expiration of the Competitiveness Pact.

For stronger economic growth in the euro area as in Finland, it is crucial for international trade to remain free and undisturbed. The benefits of globalisation have not been equally

distributed, and the adjustment costs for some industries and countries have been significant and protracted. There has been a steep increase in income differences in advanced economies over the past decades, and many have lost their jobs to structural change. More attention needs to be paid now to reducing the risk of increased marginalisation and lack of opportunities. Education plays a key role here. Education also enhances mobility, and hence employment. Taxation, income transfers and public services are, similarly, very relevant to high employment. An efficient financial system and development of a competition-friendly regulatory environment can support potential growth and employment as well as the resilience of the economy in changing circumstances.

Helsinki, 28 March 2017

Erkki Liikanen

Governor of the Bank of Finland

Tags

- cost-competitiveness
- global economy
- inflation
- monetary policy

Favourable developments and new concerns in the global economy

13 APR 2017 2:00 PM • BANK OF FINLAND BULLETIN 1/2017 • MONETARY POLICY

Global economic growth will strengthen from its 2016 level and continue at an annual pace of over 3% in the years 2017–19. Improvements in confidence in the United States and elsewhere will boost economic growth in the short term. Upside risks to US economic growth in 2018–19 could arise if the expected growth-enhancing measures of the new administration are fully implemented. At the same time, foreseeable increases in protectionism could considerably weaken global economic and trade growth.

Economic growth in China is slowing in a controlled manner and will keep global economic growth contained in 2018–19. The slowdown of growth in China follows a change from investment-driven to consumption-driven growth no longer artificially maintained through increasing debt. Downside risks to global economic developments relate to a faster-than-expected slowing down of debt-driven growth in China. Global trade is forecast to strengthen from 2016 onwards but to only outpace GDP growth by a narrow margin.

The euro area economy has been growing continuously for four years. Stable global economic growth and very favourable financing conditions will support euro area economic growth in the coming years. The main driver of growth in the euro area has thus far been private consumption. Increases in productive investment that would enhance sustainable growth potential have been modest. The unemployment rate has fallen to just under 10% and the public deficit has shrunk. The public debt ratio is now slightly below its 2014 peak. Deleveraging in the private sector has progressed, which contributes to improving the economic outlook.

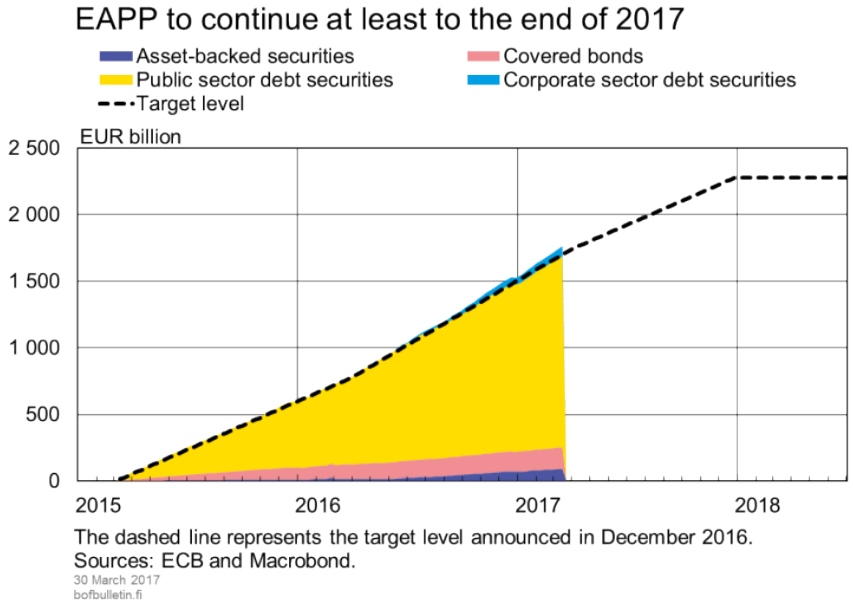
Although economic growth in the euro area has been fairly moderate in recent years, inflation has only started picking up in recent months. The recent pick-up in inflation is mainly due to temporary effects such as the rise in the price of oil relative to last year. With the economy still showing some slack, wage pressures, and hence inflationary pressures, remain modest.

The outlook for economic growth in Europe is overshadowed by uncertainties relating to the Brexit negotiations and other political events or decisions with the potential to dampen economic activity, as well as concerns over the state of banking sectors and public finances in some euro area countries. Although risks to the outlook in the EU-22 (euro area, Denmark, Sweden and the United Kingdom) remain tilted to the downside, stable economic growth is expected to continue over the next few years at a pace similar to last year i.e. close to 2%.

Monetary policy continues to be highly accommodative

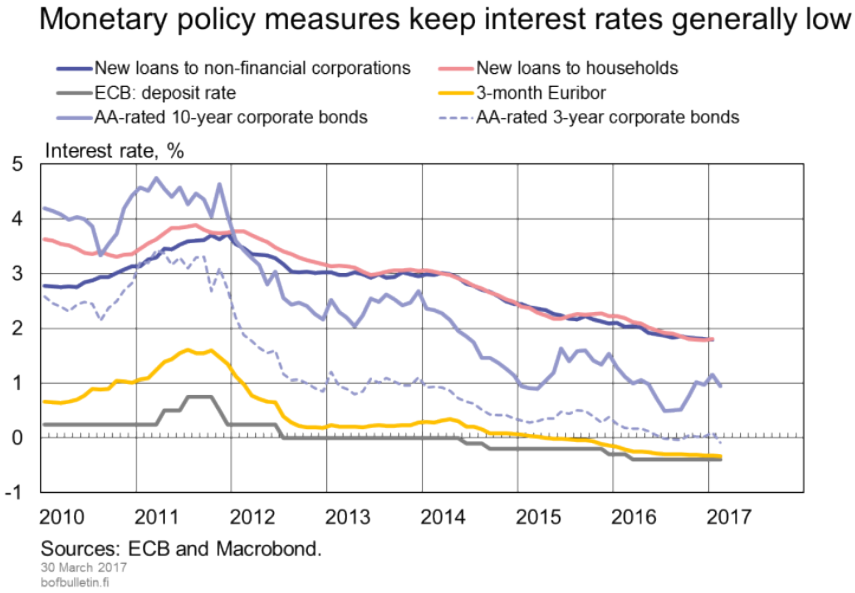
Euro area economic growth continues to be broadly based, yet inflation pressures remain modest. At its December 2016 monetary policy meeting, the ECB Governing Council decided to extend the duration of the expanded asset purchase programme (EAPP) until the end of 2017. Purchases are intended to continue until there is a sustained adjustment in the path of inflation consistent with the inflation target. The Governing Council also decided that monthly purchases would again amount to €60 billion from April 2017. Should the outlook for economic growth again weaken or the financial market situation no longer contribute positively to inflation, the volume of purchases can be increased again. To ensure continued smooth implementation, the Governing Council decided to decrease the minimum remaining maturity for eligible securities in the public sector purchase programme (PSPP) from two years to one year and to permit purchases with a yield to maturity below the interest rate on the ECB's deposit facility.

Chart 1.



Policy rates remain at an historical low. The deposit rate paid to counterparts has been at –0.40% since March 2016. (Euro area money market undergoing huge changes). The Governing Council is not expecting to raise its key interest rates before the end of the EAPP. The last operation in the series of targeted longer-term refinancing operations (TLTRO II) launched by the Governing Council in March 2016 is in March 2017. These operations offer funding to banks on attractive terms, with a four-year maturity and at the interest rate on the main refinancing operations (currently 0.0%). For banks that have sufficiently expanded their lending to households and non-financial corporations (NFCs), the interest rate can be as low as the interest rate on the deposit facility prevailing at the time of the allotment of the operation. Overall, banks have borrowed EUR 740 billion in the TLTRO II operations.

Chart 2.



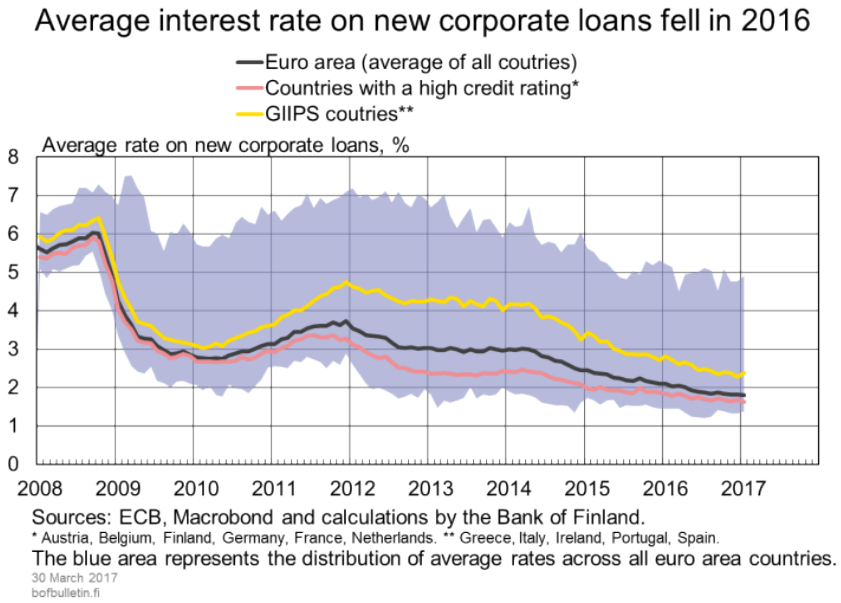
Monetary policy measures are keeping interest rates generally low and maintaining favourable financing conditions for the private sector. The accommodative monetary policy also underpins asset prices and rising inflation expectations, thereby lowering real interest rates. Government bond yields in the euro area have risen moderately since summer 2016, while remaining low on average.

Bank lending rates exceptionally low

Average rates on new bank loans continued to fall in 2016, with the average rate on loans to households falling more than that on loans to non-financial corporations. The average rate on new loans to households and NFCs was just under 2% at the start of 2017. The downward trend in the average rate on loans to NFCs would seem to have halted in the autumn of 2016. A tightening of credit standards for loans to enterprises in the fourth quarter of 2016 contributed to these developments.[1]

1. Further information is available in the January 2017 Bank Lending Survey published by the ECB.

Chart 3.



Spreads in interest rates on new loans to NFCs between stressed countries (the GIIPS countries, i.e. Greece, Ireland, Italy, Portugal and Spain) and best-rated countries (here Austria, Belgium, Finland, France, Germany and the Netherlands) continued to shrink towards the end of 2016. In the GIIPS countries, the average rate on new loans to NFCs was 2.5% in early 2017 – nearly a percentage point higher than in the best-rated countries. In Greece, the average rate on new loans to NFCs was, at 5%, nearly 3 percentage points higher than in Italy or Spain. The lowest average rate (around 1.5%) on new loans to NFCs in early 2017 was recorded in the Netherlands and Luxembourg. In Finland, rates on new loans to NFCs averaged around 1.8% and were close to the euro area average. The cost of market-based financing for NFCs as measured by corporate bond yields remains low.

Average rates on loans to households fell more in best-rated countries than in the GIIPS countries during 2016, and the spread between the groups of countries widened by double-digit basis points. On new loans to households, the average rate was around 2% in the GIIPS countries and just under 2% in the best-rated countries. In the ECB Bank Lending Survey, banks expect credit standards to ease on both loans for house purchase and those for consumer credit. The dispersion of average rates on new loans to households across euro area countries was around two percentage points in early 2017. The average rate on new loans to households was highest in Ireland (around 3%) and lowest in Finland (around 1%).

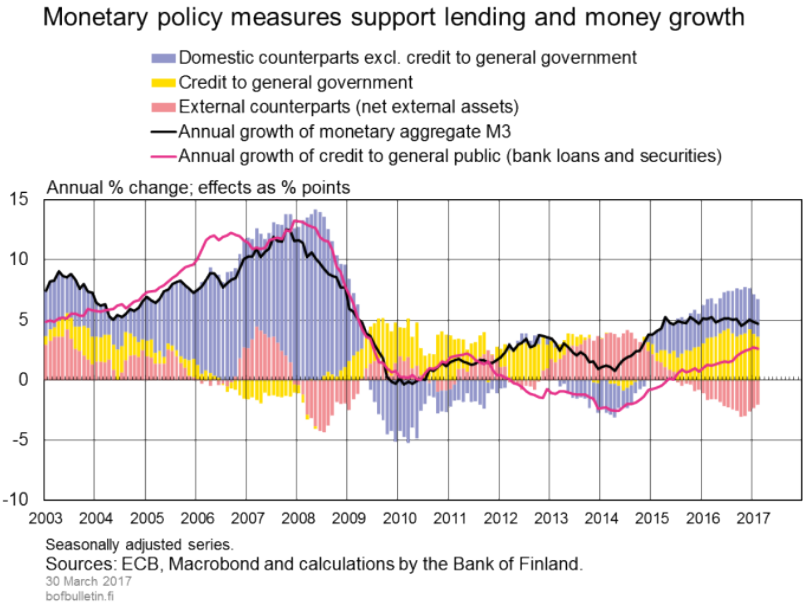
Low interest rates underpin credit growth

The ECB's monetary policy stimulus lowers interest rates and provides support to credit growth. The effects of the EAPP are felt more broadly than just in the eligible sectors, as the sellers of securities must invest the money they receive in other assets. As yields on securities diminish, lending becomes increasingly attractive for banks. Although the negative ECB deposit rate increases costs for banks, it also encourages them to use the

money market to smooth their liquidity fluctuations. The low interest rates increase demand for loans to households and NFCs, again supporting economic activity.

The availability of financing is linked to inflation developments, the real economy and financial stability. Growth in monetary variables usually also indicates an increase in real economic activity. A strong increase in lending (bank loans and banks' investments in securities issued by euro area residents), coupled with a simultaneous increase in money, is generally indicative of an increase in economic activity and, over a slightly longer term, in inflationary pressures. Conversely, if new loans are predominantly intended for the repayment of old loans and not for consumption or investment, monetary aggregates do not grow and no price pressures emerge in the economy. Of all monetary variables, the ECB consequently has its focus on credit growth.[2]

Chart 4.



Money growth[3] has recently been driven increasingly by the ongoing recovery in lending to the private sector and a reduction in long-term liabilities of the banking sector (lilac bars in Chart 4). The reduction of long-term debt is partly due to long-term deposits becoming less attractive, with low interest rates and compression of the term premium. The ECB's targeted longer-term refinancing operations have also served to replace other sources of long-term bank funding.

Another component of money growth is lending to general government (yellow bars in Chart 4). This item includes both bank loans to the general government sector (which have recently decreased) and securities purchases (which augment sellers' bank deposits) in the Eurosystem public sector purchase programme (PSPP) as part of the EAPP. Money

2. Excessive credit growth and related threats to financial stability are currently addressed mainly with macroprudential tools.

3. The broad monetary aggregate (M3) comprises currency in circulation and bank deposits but also money market fund shares/units and certain securities (those bought by euro area residents from banks in so-called repurchase agreements as well as marketable debt securities of up to 2 years' maturity).

growth is dampened by capital outflows (pink bars in Chart 4). Factors behind movements in this item include EAPP purchases of debt securities from outside the euro area where sales revenues have left the euro area.

Money growth in the euro area has been relatively stable, at an annual rate of around 5% since early 2015. In 2016, credit and money grew hand in hand. Credit growth occurs when banks increase their lending or buy debt securities issued by residents. Although the euro area banking sector's investments in private sector debt securities are at around EUR 2,000 billion currently, roughly four times higher than at the end of the 1990s, traditional bank loans still form around 85% of total credit to the private sector.

The annual growth of loans in the euro area continues to recover despite persistently large country differences. Total bank loans[4] to the private sector grew in late 2016 and early 2017 at a rate of just over 2%. The annual growth of bank investments in debt securities issued by the private sector picked up towards the end of the year and reached around 7% in early 2017.

Loan growth naturally also requires a willingness to borrow on behalf of private sector agents. According to the Bank Lending Survey, demand for loans from both households and NFCs remained strong in the fourth quarter of 2016, and this positive development seems to be continuing in 2017 as well.

Steady improvement in capital adequacy

Market confidence in European banks has recovered significantly over the past 6 months. Bank share prices have risen and spreads have remained narrow. Bank shares have benefited from expectations of growth-friendly measures and financial market deregulation by the new administration in the United States.

Improved economic outlook and the higher term premia will have a positive impact on bank profitability over the longer term. However, the recent rise in share prices has diverted attention from several vulnerabilities related to banks' long-term profitability. According to ECB Banking Supervision (SSM), the profitability of euro area banks remains weak. In the third quarter of 2016, banks' average return on equity (ROE) fell significantly year-on-year to around 5.5%. The main factors behind weak profitability growth have been adverse developments in net interest income, fees and commissions as well as various structural issues.

In many euro area countries high levels of non-performing loans still weigh on bank profitability and hamper their ability to act as financial intermediaries to the real economy. This perpetuates lending differentials across euro area countries. The problem of non-performing loans is being addressed with new methods, but solving the problem will take time.

The European banking sector also suffers from excess capacity and inefficiencies. The sector is large relative to the economy, and in many core countries the number of branches is considerable. The large number of banks and increased competition for

4. Adjusted for loan sales and securitisation.

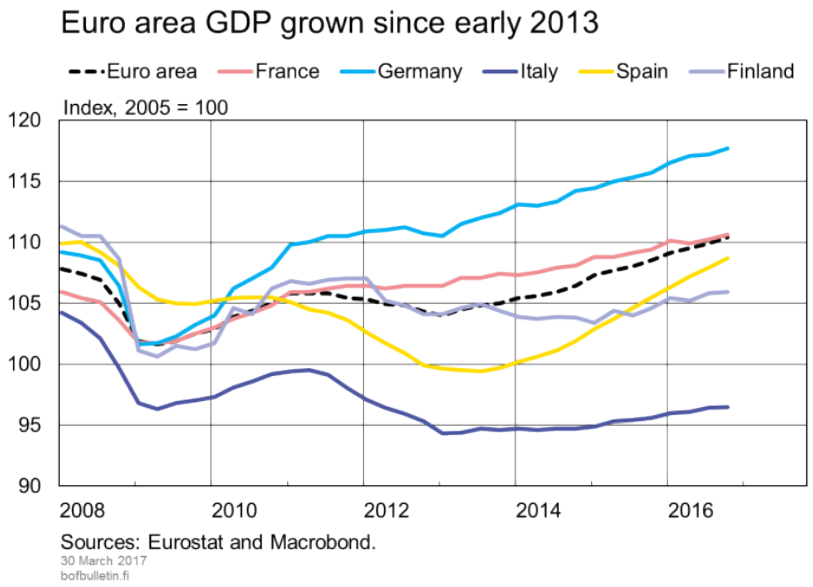
diminishing returns have contributed to weakening bank profitability. These profitability issues affect banks' ability to renew their business models to better respond to changing customer preferences and competition from outside the sector. There is a risk that weaker returns will hamper bank restructuring and further constrain their ability to provide funding to the real economy. Up to now banks' cost-to-income ratios have remained high regardless of cost cutting.

On the positive side, banks' capital adequacy in the euro area has been steadily improving since 2008 despite profitability issues, and it has almost doubled since the crisis. According to ECB data, banks' Tier 1 capital adequacy averaged 14.5% in the third quarter of 2016. For banks, completion of the regulatory initiatives currently under preparation would be key. This would reduce uncertainty about future capital needs and support lending. Ongoing discussion on deregulation perpetuates uncertainty. Any deregulation can lead to a build-up of vulnerabilities in the financial sector in the long term. Should risks related to economic developments or markets materialise, these vulnerabilities would weaken financial intermediation, which in turn would negatively impact on real economic developments.

Four years of uninterrupted growth in the euro area

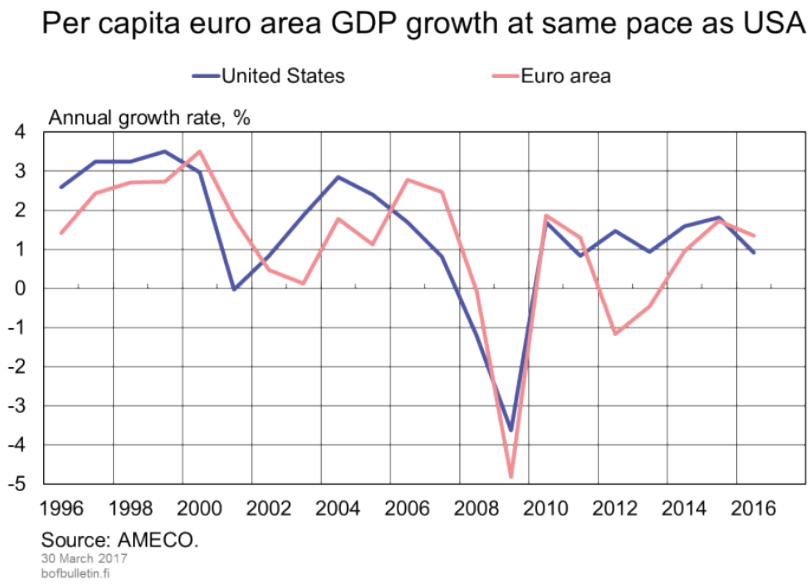
Euro area GDP grew by 1.7% in 2016, driven by private consumption and investment. The rise in confidence indicators suggests growth will remain brisk in the early part of 2017. There has now been four years of uninterrupted growth. The internal fundamentals of the euro area economy have not changed during the last six months. They are supporting growth. Accommodative monetary policy will continue to keep the private sector's financing conditions relaxed and the debt-servicing burden moderate. Near-term fiscal policy will be broadly neutral and the labour market will continue to improve. In these respects, the favourable trend is projected to continue in the immediate years ahead.

Chart 5.



Despite recent years' uninterrupted growth in the euro area economy, GDP growth in the past two decades has remained slower than in the United States. Per capita, however, the difference in GDP growth between the euro area and the USA is smaller. In 2015–2016, per capita GDP growth was actually stronger in the euro area. On the other hand, the euro area sovereign debt crisis is clearly evident also in per capita GDP growth, and in 2012–13, in particular, growth was slower in the euro area than in the USA.

Chart 6.

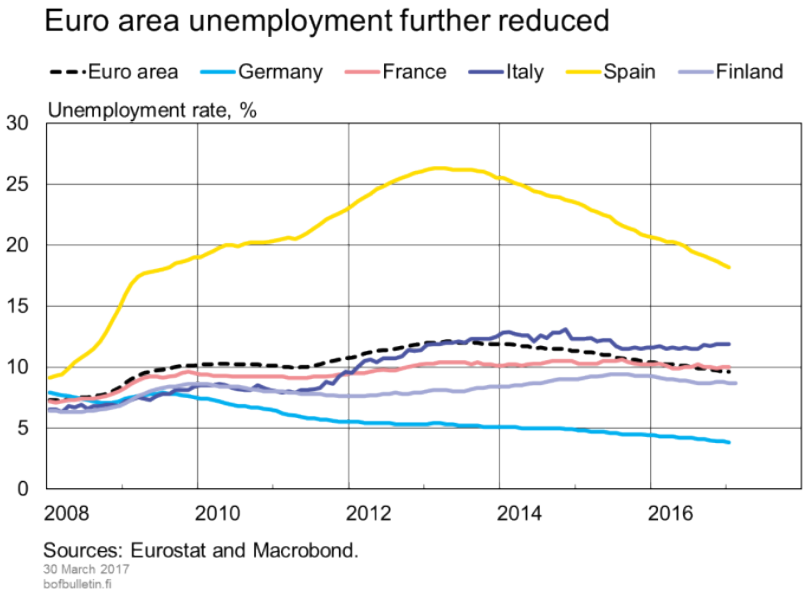


Domestic demand driving euro area growth

Private consumption and private investment were the components of aggregate demand that made the strongest contribution to euro area growth in 2015–2016. The composition of growth will be similar in the next few years. Public consumption will make a slight contribution to growth on average, but the contribution of net exports will be very modest.

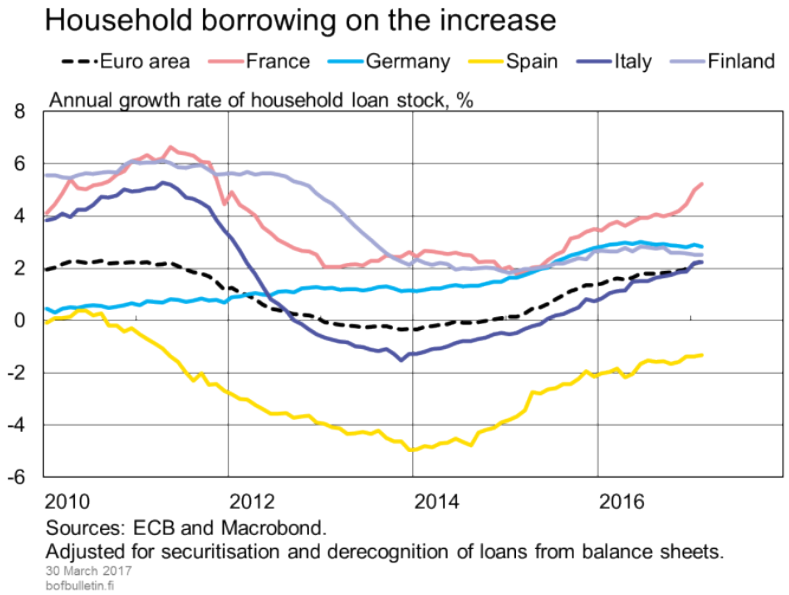
Private consumption will be bolstered by an increase in households' disposable income amid a steadily improving employment situation and higher labour income per employee. On the other hand, a slight acceleration in inflation will push down growth in real disposable income. The euro area unemployment rate has declined from a peak of 12% to slightly below 10%. Differences across countries are, however, still significant. Even though cyclical conditions will further reduce unemployment in the next few years, the euro area is beginning to approach structural unemployment levels. Decisive country-specific measures are still needed to reduce structural unemployment.

Chart 7.



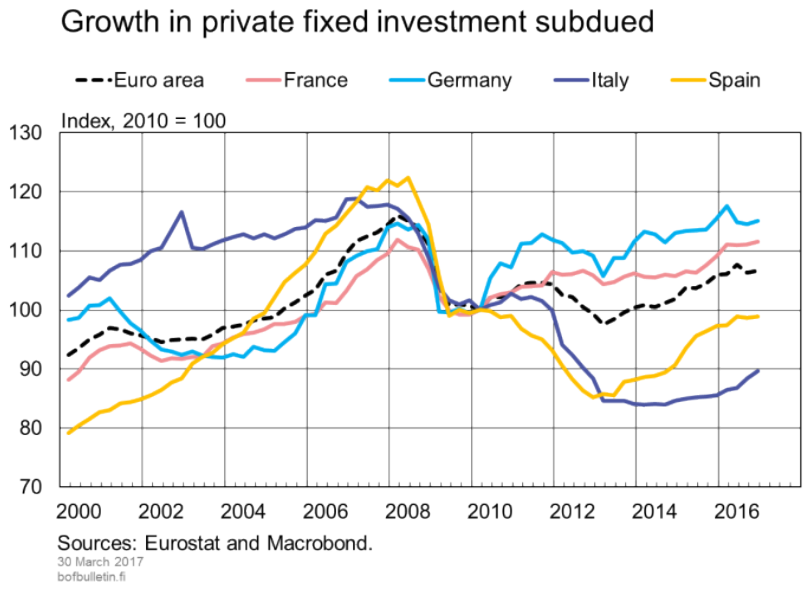
Accommodative financing conditions will boost household borrowing. Growth in the stock of loans to euro area households gathered momentum towards the end of 2016, and at the beginning of 2017 the household loan stock was up a good 2% year-on-year. Households' debt-servicing costs relative to income decreased in the euro area further in 2016, on the back of low interest rates. In France, household borrowing is growing notably faster than in the euro area on average, and at the same time interest rates on new loans to households have fallen faster than in the euro area on average. The brisk growth in new loans and renegotiations of existing loans have kept French households' debt-servicing costs (interest payments and repayment of capital) relative to income on a downward trend. In Germany, growth in household borrowing has remained considerably more moderate, and total debt relative to household income has remained stable. In Spain, households are still continuing to pay down their debts and the stock of household loans is contracting. In Italy, meanwhile, the household loan stock is growing, but debt-servicing costs relative to income have remained moderate.

Chart 8.



A pick-up in investment growth is a precondition for sustainable growth in the euro area. Private fixed investment begun to grow a few years ago, and the trend continued also in the latter part of 2016. However, the level of private fixed investment is still markedly below the peak prior to the global financial crisis. Investment growth in the next few years will be buttressed by the very low interest rate environment, the improved availability of finance, the need to renew the capital base after weak investment activity in 2008–2013 and the notably lower level of corporate sector indebtedness in certain countries.

Chart 9.



Accommodative financing conditions are also supporting borrowing by euro area non-financial corporations. At the beginning of 2017, the annual growth rate of the stock of corporate loans was around 2.5%.

Growth is still fragile, however: in January the corporate loan stock was 1% up on a year earlier. As in the case of households, debt-servicing costs relative to income have also decreased for the corporate sector.

The corporate sector is continuing to deleverage. Total corporate debt relative to GDP or value added contracted further during 2016. Euro area non-financial corporations' interest expenses and capital repayments relative to net income have declined further. Of the large euro area countries, corporate deleveraging has been by far the most notable in Italy and Spain. In France, the annual growth rate of the corporate loan stock markedly outpaces the euro area average. Although French corporations' total debt relative to GDP increased, debt-servicing costs relative to income decreased on the back of low interest rates. In Germany, growth in the stock of loans strengthened in the latter part of 2016 to figures well above the euro area average, but relative to GDP the total debt ratio remained stable and was clearly the lowest among the large euro area countries.

Among the large euro area countries, Italy's growth prospects are still muted

Germany's economy grew by 1.9% in 2016. The German economy is projected to maintain the strong growth momentum in the immediate years ahead, fuelled by private consumption and employment growth. Germany's economic fundamentals are in good shape: the economy is competitive, household indebtedness is at a moderate level and the unemployment rate ranks among the lowest in the euro area. With the lowest debt ratio among the large euro area countries, Germany has no need for fiscal consolidation over the forecast horizon.

The French economy grew by 1.1% in 2016. Growth slowed slightly from 2015, but was markedly brisker than in previous years. The pace of growth is projected to pick up in the next few years, underpinned by domestic demand and, notably, private consumption. Investments are also recovering. The economy continues to be supported by favourable monetary conditions. Fiscal consolidation will continue, at a moderate pace. Despite economic growth, unemployment in France will only decline slowly, as it is largely structural in nature. The effects of employment market reforms are not expected to materialise in the short term.

The Spanish economy has grown robustly since the turnaround in 2013. Already at the end of 2016, GDP reached about the same level as prior to the financial crisis. Growth is projected to continue at a stronger pace than the euro area average, but gradually moderating. Growth is supported by improvements in price competitiveness, structural reforms and the bottoming out of the housing bubble burst a few years ago. Favourable developments are also bolstered by accommodative financing conditions, reflecting the combined effect of monetary policy and consolidation in the banking sector. The continued brisk pace of growth will reduce unemployment and fuel inflation in the

forecast period. The general government deficit is still large, however, and government debt has stayed around 100% of GDP.

The Italian economy has turned to growth in 2015 and 2016 after a long period of contraction. Growth has been relatively muted, however, in 2016, at slightly below 1%. The economy is projected to continue growing at a rate of around 1% in the immediate years ahead. Growth is supported by Italian government measures to improve the state of the banking system as well as the accommodative monetary policy and export growth. The phasing out of tax incentives for new recruitment has weakened employment developments, which is in turn reflected in the slight slowdown in consumption growth. If the employment situation does not improve or if export growth were to decelerate, economic growth may turn out to be even weaker than expected. Italy's muted growth prospects and the high government debt ratio (slightly over 130% of GDP) still give cause for concern.

Brexit negotiations get underway

The United Kingdom has announced that it will submit its notification of withdrawal from the EU in March 2017. The withdrawal notification will trigger the official exit negotiations of Article 50 of the Treaty on European Union. The negotiations have a two-year deadline.

Prime Minister Theresa May stated in January 2017 that UK was striving for a 'comprehensive, bold and ambitious' free trade agreement with the EU. Since it usually is a long-term process to negotiate free trade agreements, uncertainty about the future will continue for a prolonged period, and some kind of transitional agreement for the time between the UK exit and ratification of a new agreement would surely be in the interest of both parties.

In 2016, GDP growth in the United Kingdom was around 2%. Since the referendum, sterling has depreciated around 10% on a trade-weighted basis, which has pushed up export prices and fuelled inflation to about 2% at the beginning of 2017. The Bank of England has announced that it is ready to raise interest rates, should inflation accelerate excessively. The pick-up in inflation dampens growth in real household incomes and consumption. Investment activity and – due to the lower exchange rate – exports have been weak. The outlook for investment is strained by uncertainty over the coming negotiations. GDP growth is projected to be below 2% in 2017 and around 1½% in the immediate years ahead.

Sweden's GDP grew by slightly over 3% in 2016. The output gap is assessed to have closed during 2016, and GDP growth is therefore expected to ease slightly. Sweden's economic growth is projected to remain at about 2½% in the next few years. Inflation has remained moderate relative to economic growth, enabling the Riksbank to maintain its expansionary monetary policy stance. The looming housing bubble and rapidly increasing household debt remain the greatest downward risks to stable economic developments.

In Denmark, the economy grew by about 1% in 2016. The Danish economy is close to full employment and inflation has remained very low. Growth in real incomes has boosted

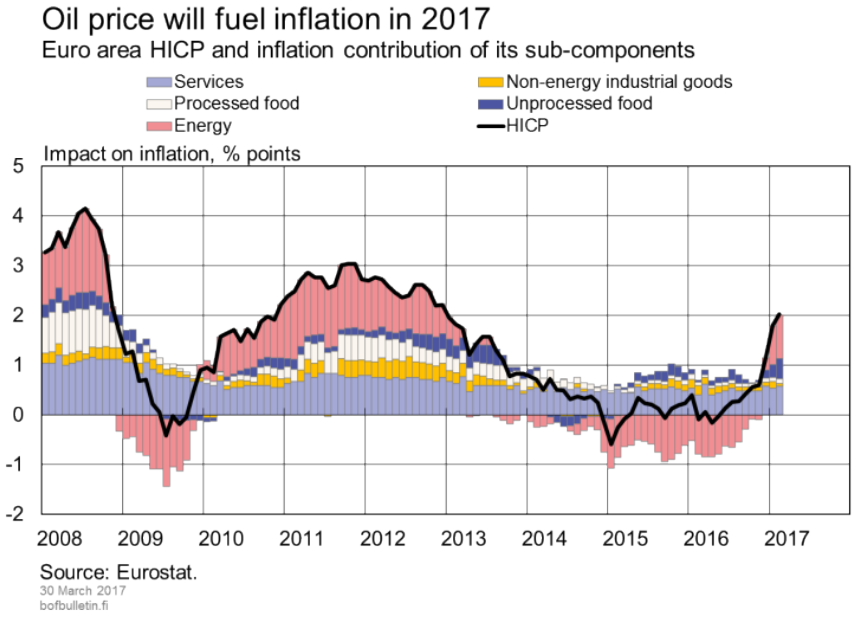
private consumption. Fuelled by domestic consumption, growth will strengthen in the coming years to about 1½%.

Oil price impact fuels inflation – core inflation slower

Euro area inflation picked up towards the end of 2016, following a protracted period of low inflation. In 2016, inflation averaged only 0.2%, but in December it accelerated to 1.1%, and at the beginning of 2017 it reached levels close to 2%.

The rapid pick-up in inflation is due mainly to the price of oil, the direct effects of which are reflected in inflation via two channels. On one hand, the steady rise in the oil price from the trough of 2016 will push up costs. On the other hand, changes in the price of oil are reflected in inflation also mechanically, via the base effect (Temporary factors have fuelled euro area inflation). The price of oil is now significantly higher than at the beginning of 2016. As inflation is measured as the year-on-year change in prices, the base effect caused by the low price of oil a year earlier has a significant upward impact on inflation. Even if the price of oil were to remain at the current level and not continue to rise, the oil price base effect will be reflected in inflation throughout the current year. Based on oil futures prices and various expert assessments, the price of oil will stabilise to levels close to USD 55 per barrel in the immediate years ahead. If the price of oil remains stable, the oil price base effect, stemming from the energy component and pushing up consumer prices in 2017, will dissipate at the beginning of 2018.

Chart 10.



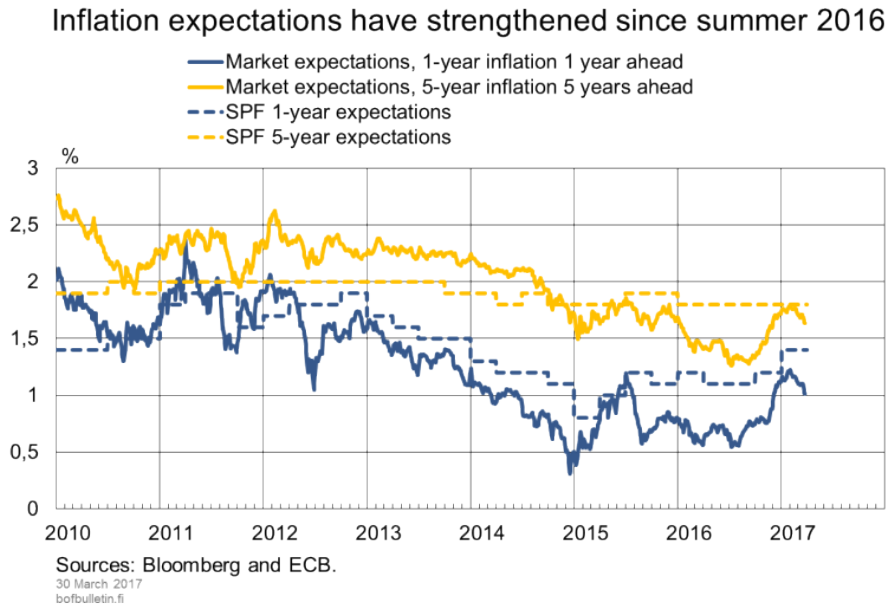
Changes in the price of oil usually cause only temporary fluctuations in inflation ('Frequency of rising and declining prices in the euro area'). Assessments of the medium-term outlook for inflation should be accompanied by an examination of core inflation (inflation excluding the prices of raw materials and food), which reflects longer-term price pressures internal to the euro area. For the past three years, core inflation has

persisted at levels slightly below 1%, whereas the average rate since the introduction of the euro has been close to 1.5%. Core inflation has been dampened by moderate wage developments in the euro area in recent years, and there are still no signs of a pick-up in wage inflation. A more broadly based transmission of the rise in fuel and energy prices to consumer goods prices would weaken consumers' purchasing power and could therefore lead to higher wage demands. A temporary acceleration in inflation, due to a rise in the price of oil, and leading to wage increases is referred to as a second-round effect. At least so far, however, the temporary rise in inflation has not been transmitted to wage inflation and made the pick-up in inflation a more permanent phenomenon.

Inflation is expected to remain moderate in the immediate years ahead, as there is still slack in the euro area economy. According to various estimates, output is still below potential, i.e. the output gap is still open. An open output gap means that there is unutilized resources in the economy. Subsequently there is only modest upward pressure on wages, and hence prices. As a result, core inflation is expected to pick up only slowly as the output gap closes gradually in the immediate years ahead.

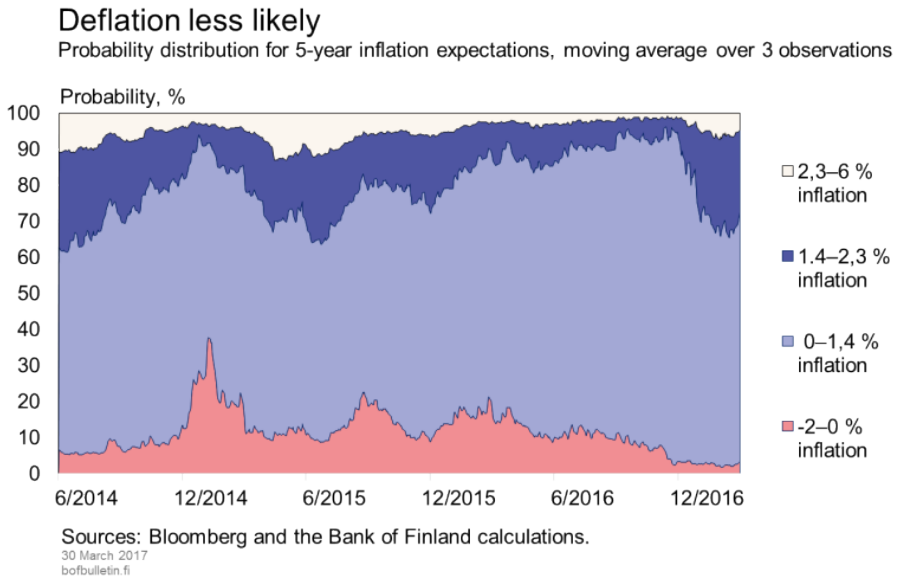
The moderate rate of inflation also reflects the ongoing low level of inflation expectations. From the perspective of the objective of price stability it is, however, positive that inflation expectations have risen significantly from the exceptionally low levels of summer 2016. The increase has been broadly based and has been reflected in inflation expectations derived from market information, and more recently also in surveys of professional forecasters. The rise in short-term inflation expectations largely reflects the higher price of oil and the recent brisk pace of actual inflation. More relevant is, however, the increase in market-based longer-term expectations that extend over the business cycle. This shows that economic agents' perception of inflation developments has strengthened and that there is a smaller risk of divergence in inflation expectations from their anchor, i.e. the ECB's price stability objective. (Have market inflation expectations strenghtened?)

Chart 11.



The improvement in inflation expectations and recent developments in inflation have alleviated the threat of deflation in the euro area. A dampening of inflation expectations may give rise to a self-reinforcing spiral in the price mechanism, which will eventually slow the rise in prices. The probability of negative inflation, derived from market information, has, however, decreased since summer 2016, and is now virtually non-existent. Even though inflation is expected to remain moderate in the medium term there is also a higher probability that the inflation rate will exceed 2%.

Chart 12.



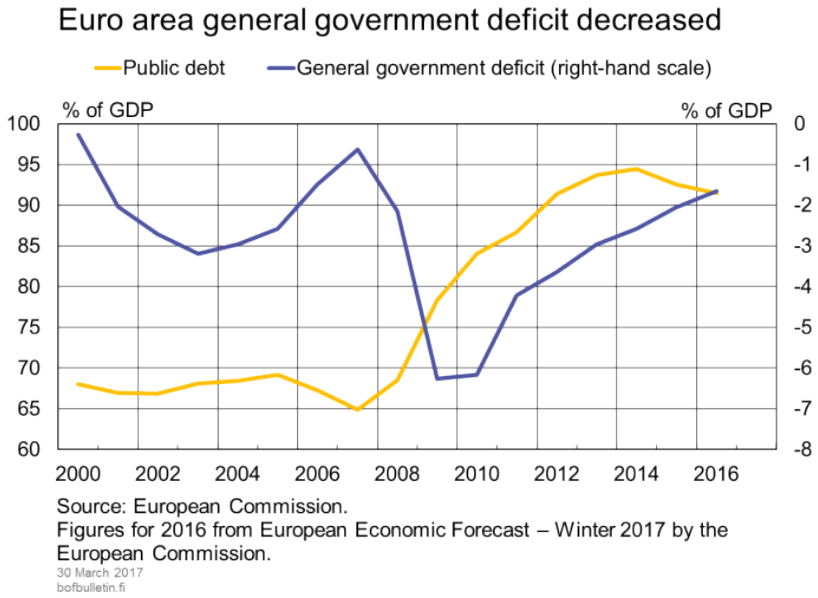
Overall, the outlook for euro area inflation has improved in the past six months. Oil price developments will fuel inflation significantly in 2017, but as the base effect fades away the rate of inflation will level off slightly. There is still unused capacity in the economy and wage developments are moderate, and core inflation will therefore rise at a slow pace. The positive outlook for the economy, the closing of the output gap, the sustained accommodative monetary policy stance and the improvement in inflation expectations will gradually push up inflation closer to the price stability objective.

Slow reduction in euro area general government debt

The escalation of the financial crisis in 2008 and the euro area sovereign debt crisis that followed were reflected in a protracted weakening of public finances in the euro area. Only in 2015 did the euro area general government debt ratio pass its peak (approximately 94% of GDP in 2014) and begin to decline. The debt ratio is expected to continue to decline in the immediate years ahead. Among large euro area countries, only Germany's debt ratio is expected to decrease notably, whereas in France, Italy and Spain, the general government debt-to-GDP ratio will remain more or less unchanged in the immediate years ahead.

Over the past few years, the decrease in the euro area general government deficit has been sustained mainly by the improved cyclical conditions and smaller interest payments. The overall general government deficit continued to decline in 2016 and stood well below 2% of GDP. In the period since 2000, the deficit has reached levels below 2% only in 2006 and 2007, which were very favourable years. The deficit is expected to continue to decrease significantly in 2017, but in subsequent years at a slower pace. The size of the deficit differs from country to country: Germany has a budget surplus, whereas the other large euro area countries continue to record significant deficits.

Chart 13.



In addition to cyclical conditions, the current state of and outlook for the public finances are also affected by the prevailing level of interest rates and discretionary fiscal measures. Of these factors, cyclical conditions are currently the most important factor improving the euro area public finances. The prevailing level of interest rates is still very low, particularly in the shorter maturities, but also in longer maturities. Interest payments on government debt are therefore expected to remain moderate in the immediate years ahead. The importance of discretionary fiscal measures aimed at consolidating the public finances has been minor since 2014. The near-term fiscal policy stance for the euro area is expected to be broadly neutral. Towards the end of the forecast period, however, there will be growing pressure to tighten fiscal policy in many euro area countries, due to the stricter requirements imposed by the Stability and Growth Pact as a result of the closing of the output gaps.

Discussion has continued as to the appropriate fiscal stance for the euro area. In its Communication[5] adopted in November, the European Commission proposed that based on the current cyclical conditions for the euro area, the fiscal stance should be expansionary and that a fiscal expansion of up to 0.5% of GDP is desirable for 2017. At

5. European Commission Communication (2016). Towards a positive fiscal stance for the euro area. COM(2016) 727, 16 November 2016.

the same time, the Commission noted that Member States have to make good on their commitments to the Stability and Growth Pact. In the Commission's view, Member States that have more fiscal space to act should, however, in their own policies, also take more account of the euro area aggregate fiscal stance. This should be done particularly in connection with public investments that strengthen the growth fundamentals. The Eurogroup nevertheless concluded that a broadly neutral aggregate fiscal stance in 2017 strikes an appropriate balance, although it also stressed the importance of a growth-enhancing composition of budgetary measures. In the current economic situation, determined implementation of structural reforms is more important than fiscal expansion. This would improve the longer-term growth outlook for the euro area.

Risks still predominantly on the downside

The main risks to the euro area growth and price outlook can be divided into risks to the international economy and internal euro area and EU risks. Although the risks to the US growth outlook are on the upside, risks overall are still predominantly on the downside. The forecast for the international economy is presented in a separate forecast box [Link: 'Forecast for the global economy'].

Risks to the international economy

The risks related to the aspirations of the new US administration are on the upside. The new administration aims for infrastructure investment, tax reforms and reductions and deregulation. Fiscal stimulation as well as deregulation may boost US growth in the immediate years ahead. Because no detailed information is yet available on these plans, not to mention decisions, from the forecast point of view this is still just an alternative scenario of accelerating growth and inflation.

If the plans for public investment in infrastructure come through, they will improve the growth prospects for the output potential of the whole economy. However, any higher-than-predicted growth may prove short-lived if the measures of the new administration do not increase the longer-term growth potential. Deregulation in some areas of the economy may improve the growth of output potential, but again, the short-term growth effects of financial market deregulation are overshadowed by the growing risks to financial stability in the longer term. In addition, the US administration has not so far specified how possible fiscal consolidation could be achieved. An alternative scenario of a possible fiscal stimulus by the new US administration that is partially financed through a border adjustment tax is presented in Box 'Scenario based on US economic policy plans' [Link].

The downward risks to the international economy relate to increased limitations to free trade and a more rapid decline in China's debt-driven growth than anticipated.

Possible protectionist measures by the USA and other countries form a negative risk to the growth outlook over the next few years. The new US administration has brought customs duties and trade policy agreements into the centre of the debate. Experiences

with the negative effects of customs duties on world trade do not support such measures. Against this background, the US administration will scarcely aim for any significant increase in customs duties, but it is setting out to renegotiate agreements with its trading partners to achieve more favourable positions from its own point of view. One alternative to increased customs duties has been the border adjustment tax, which would have an import-reducing and export-enhancing effect.

Chinese growth risks are still on the downside. China's growth is debt-driven, which exposes it to risks from financial market disruptions. The profitability of Chinese banks is also weak and the country's shadow banking system is vulnerable to financial market disturbances.

Internal euro area and EU risks

The short-term economic effects of the upcoming UK departure from the EU (the Brexit) have been smaller than expected. However, due to the Brexit much uncertainty is related to the longer-term outlook for both the UK and the EU, because the effects of the departure depend on, among other things, the progress and final results of the negotiations. Although the Brexit referendum as well as other unexpected political events of recent years have not disrupted the euro area growth, this will not necessarily remain unchanged.

The euro area is still recovering from the financial and debt crisis, as evidenced by the fact that there are persistent concerns about the condition of the banking sector and the outlook for the public finances in certain countries. The large amount of nonperforming assets in euro area banks is still a problem in several countries (Cyprus, Greece, Italy and Portugal). Cypriot and Greek banks are in the most difficult position, as their nonperforming assets approach 40% of the banks' risk-weighted assets. Portuguese and Italian banks also still have a lot of nonperforming assets (about 15–20% of their risk-weighted assets). There is still a great deal of uncertainty as regards the economic outlook for Greece. The publicly reported EU and IMF disagreements on the sustainability of the Greek public debt have once again raised the question of the difficult situation of Greece. The rating of Portuguese government debt as investment grade is also still hanging by a thread.

Tags

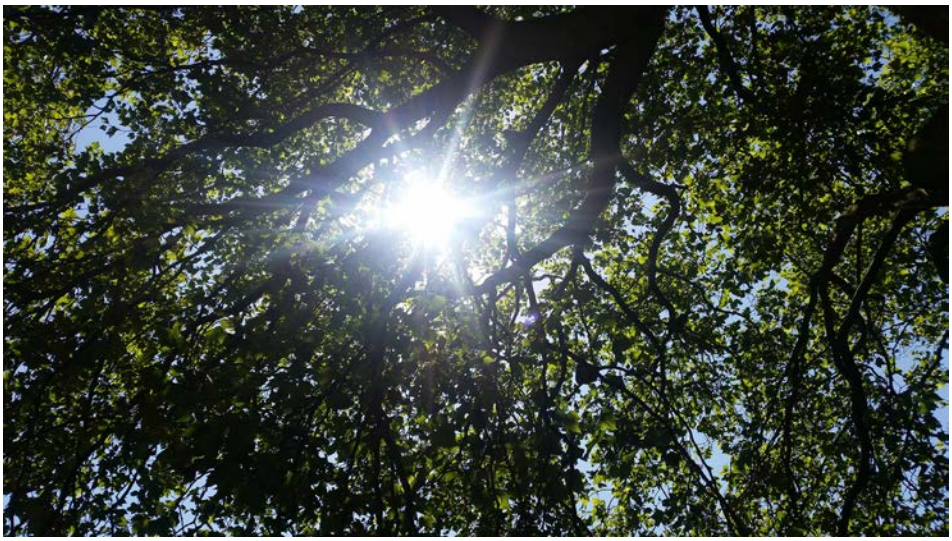
- economic growth
- global economy
- inflation
- monetary policy

FORECAST FOR THE GLOBAL ECONOMY

Global economy to grow steadily

TODAY 1:00 PM • BANK OF FINLAND BULLETIN 1/2017 • ECONOMIC OUTLOOK

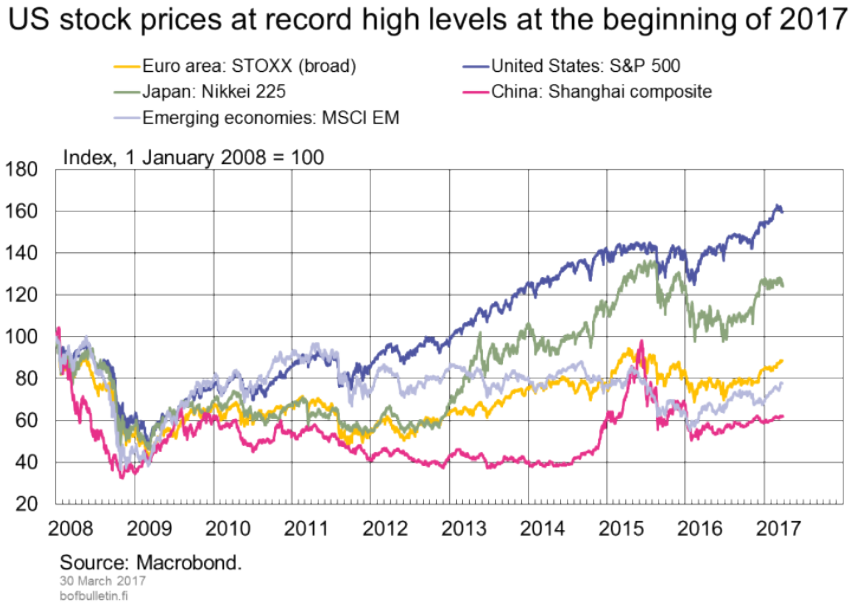
The Bank of Finland foresees global growth strengthening relative to 2016 and continuing at a rate over 3% in 2017–2019. Improved confidence in both the United States and more broadly will reinforce favourable developments over the short term. Economic growth in the EU22 (euro area, United Kingdom, Sweden and Denmark) and the United States will remain fairly rapid throughout the forecast horizon. Growth in China will slow in an orderly manner, thus dampening global activity towards the end of the forecast period. Oil price increases will push up inflation in 2017 but will simultaneously support the recovery of the Russian economy.



Markets expect US growth to accelerate

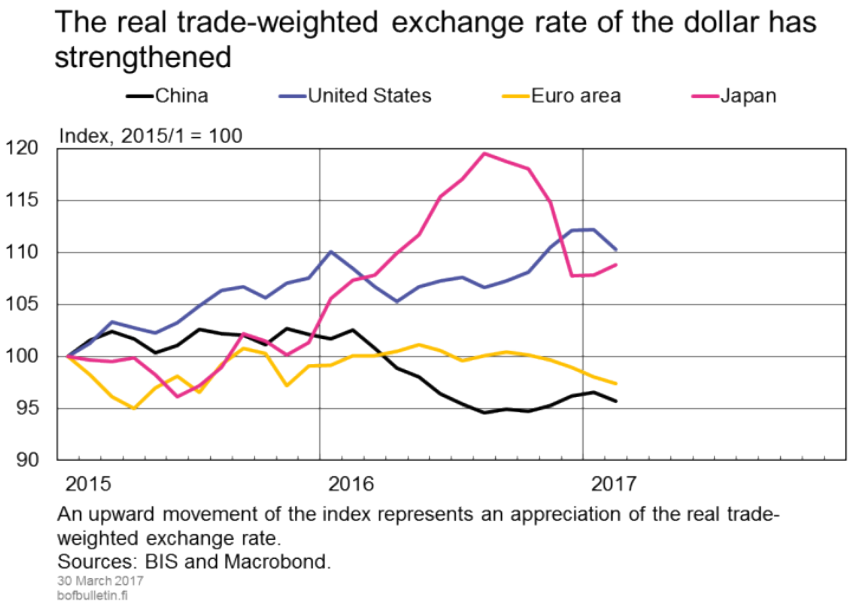
The fiscal stimulus and deregulation planned by the new US administration are predicted to fuel growth, at least temporarily. These market expectations have been reflected in, among other things, higher stock market valuations in the United States since the presidential elections in November 2016. There has been a broadly based increase in stock prices compared with last summer.

Chart 1.



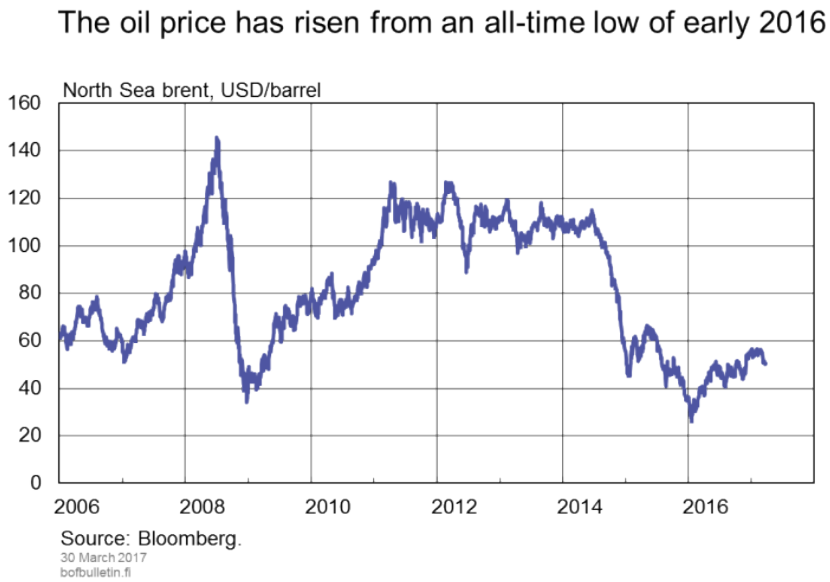
In addition, expectations of an acceleration in US economic growth and inflation have raised long-term government bond yields and strengthened the real trade-weighted exchange rate of the dollar. The real trade-weighted exchange rate of the euro has recently witnessed mild depreciation.

Chart 2.



The world market price of oil has risen by approximately 10% since autumn 2016, and it is expected to remain at around USD 55 per barrel in the period ahead. The oil price has been pushed up by both higher growth expectations and voluntary output restrictions set by key oil producers.

Chart 3.



China's fading growth reins in global growth

The Bank of Finland foresees global growth proceeding at a pace of well over 3% in 2017–2019, i.e. slightly faster than in 2016. The risks to the global economy are discussed in the article 'Favourable developments and new concerns in the global economy' from the perspective of euro area growth and inflation developments.

Table 1. Growth forecast for the global economy 2017–2019

Change in GDP and world trade

% change on previous year (previous forecast below)

GDP	2016	2017[f]	2018[f]	2019[f]
United States	**1.6**	**2.4**	**2.2**	**2.2**
	(1.6)	(2.3)	(2.2)	
EU22	**1.8**	**1.8**	**1.7**	**1.6**
	(1.7)	(1.3)	(1.6)	
Japan	**1.0**	**1.1**	**0.8**	**0.7**
	(0.4)	(0.9)	(1.0)	
China	**6.7**	**6**	**5**	**5**
	(6.5)	(6)	(5)	
Russia	**–0.2**	**1.5**	**1.5**	**1.5**
	(–1.0)	(1.0)	(1.5)	
World	**2.8**	**3.2**	**3.1**	**3.1**
	(2.8)	(3.1)	(3.1)	
Word trade	**1.7**	**3.4**	**3.6**	**3.6**
	(1.5)	(3.2)	(3.5)	

f = forecast

EU22 = euro area, Sweden, Denmark and United Kingdom.

Source: Bank of Finland.

In the United States, economic growth is expected to pick up to 2.4% this year, after the dip experienced in 2016. The recent improvement in confidence will strengthen growth over the short term. The forecast does not, however, take account of a potential future fiscal stimulus or other changes in economic policy, as no decisions on these are yet available. During the forecast horizon, the pace of US economic growth will nevertheless remain good and maintain global growth. US inflation is expected to edge up to markedly over 2%, as output exceeds its potential level, thereby causing price pressures to mount.

Economic activity in the EU22 countries in 2016 turned out to be better than anticipated, with near-term growth envisaged to continue at a pace of slightly below 2%. EU22

inflation will rise to around 2% in 2017, on the back of temporary factors (increases in oil and unprocessed food prices). In 2018–2019, inflation in the EU22 countries is forecast to slow to some extent amid still moderate price pressures and muted inflation expectations.

Chinese economic growth will decelerate in an orderly manner, but will nevertheless significantly sustain global growth. Even so, the slowing of growth in China to 5% means that global growth will not accelerate during the forecast period. The consumption tax increase in Japan, taking place in 2019, will slow Japanese growth and correspondingly boost inflation.

The elevation of the oil price will bolster growth in the Russian economy during the forecast period. The stable developments in the emerging economies will continue. Global trade growth will firm up during the forecast period, but will only slightly exceed global GDP growth, as in recent years.

Table 2. Inflation forecast for the global economy 2017–2019

Inflation in key economies

% change on previous year (previous forecast below)

	2016	2017[f]	2018[f]	2019[f]
United States	**1.3**	**2.5**	**2.5**	**2.4**
	(1.1)	(2.1)	(2.2)	
EU22	**0.3**	**1.9**	**1.6**	**1.7**
	(0.4)	(1.4)	(1.5)	
Japan	**–0.1**	**0.5**	**0.7**	**1.3**
	(–0.1)	(0.6)	(1.0)	

f = forecast

EU22 = euro area, Sweden, Denmark and United Kingdom.

Sources: National statistical authorities and calculations by the Bank of Finland.

Ongoing steady growth in EU22

The impact of Brexit on the short-term growth rate of the United Kingdom and, by extension, of the EU22 countries looks set to remain more limited than previously anticipated. According to the Bank of Finland's estimate, growth in the EU22 will continue at a steady pace of just under 2% in 2017–2019. Economic activity will be

largely based on higher domestic demand. Brexit will, however, cloud the outlook for the United Kingdom, in particular. The accommodative monetary policy and stable global growth will continue to support favourable developments in the EU22.

EU22 inflation will pick up over the short term on the back of temporary factors. These include the elevation of oil and non-processed food prices. Wage developments in Europe have been very stable, with so far no signs of second-round effects on wages from higher oil prices.

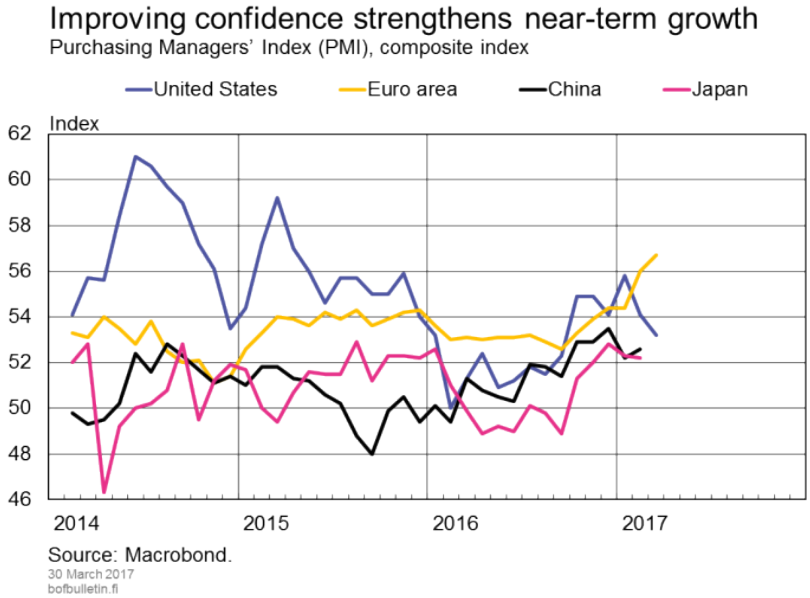
UK inflation will increase as a result of the depreciation in the exchange rate. Euro area monetary policy and economic activity are discussed more closely in the article 'Favourable developments and new concerns in the global economy'.

US growth much quicker than 2016

GDP growth in the United States in 2016 was a modest 1.6%. Growth was sustained by private consumption. Towards the end of the year, negative net exports dampened growth. The Bank of Finland predicts growth to accelerate significantly in 2017, to 2.4%.

The planned measures of the new US administration are expected to add momentum to the country's economic growth. However, as no concrete decisions have yet been made on fiscal measures, such as tax reform and infrastructure investment, they have been taken into account in the risk assessment instead of the baseline forecast. Expectations of stimulus measures have pushed up confidence indices. Admittedly, the indices may have been affected by many other factors, such as the recovery on the labour market and nominal wage increases. A higher degree of confidence will reinforce near-term growth, and investment in particular is expected to be up from last year.

Chart 4.



Contraction in US industrial output came to an end and output expanded towards the end of 2016. The measures and plans of the new administration for deregulation and the

recovery in the mining and quarrying industry caused by the higher price of oil will buttress the corporate sector. For example, the decisions on the construction of two large oil pipelines will be significant for the mining industry and reverberate across other sectors, too. The strong exchange rate will, however, subdue exports and bolster imports, meaning that the contribution of net exports to growth is expected to remain mildly negative throughout the forecast horizon.

In the absence of new growth-friendly economic policy decisions, the US GDP growth rate is projected to slow moderately, to 2.2% in 2018 and 2019. Even this rate of growth is, however, somewhat faster than the estimated US potential growth rate, i.e. the rate at which the economy can grow without stoking inflation when its resources are fully utilised. However, if the new administration's growth-enhancing measures were to materialise, the country's economic growth in 2018–2019 would be a good 0.5 of a percentage point stronger than forecast here (See 'Scenario based on US economic policy plans').

US inflation accelerated to approximately 2.5% at the beginning of 2017. According to the inflation indicator (Personal Consumption Expenditure, PCE) monitored by the US Federal Reserve, the rate of increase in prices still remained marginally below the targeted 2%.

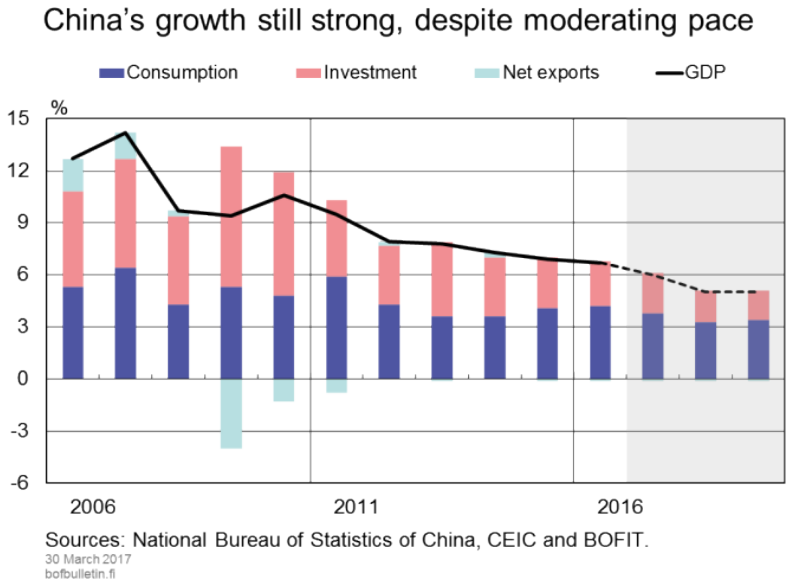
The measures of the new administration are expected to fuel inflation, which is reflected in strengthening inflation expectations on the financial markets. Inflation will also be driven by labour market tightening and higher wage inflation. Inflation measured in terms of the consumer price index is projected to remain at a pace of about 2.5% in the immediate years ahead. Rising inflation will have a dampening impact on increases in real wages. Good employment developments will, however, support private consumption, which is predicted to remain strong over the near term.

China needs a determined reform policy

China's GDP growth in 2016 according to the Chinese statistical authority, the National Bureau of Statistics of China, was 6.7%, which is marginally less than in 2015. Growth is expected to slow further still but in an orderly manner, and the baseline forecast is therefore positive. The Bank of Finland sees GDP growth in China slowing to around 6% in 2017, after which it will fall to some 5% in 2018–2019.

Easy ways of increasing Chinese output are becoming hard to find. Growth will be dragged down by population ageing, the shift of the production structure towards services, and environmental problems. The scope for fiscal stimulus will be narrowed by growth in indebtedness, currency flight and higher inflation, even if price increases are not yet presenting any immediate threat to economic policy.

Chart 5.



Investment activity in China decelerated considerably in 2016, as public investment underpinned by expansionary policies was unable to fully replace the slowing of private investment growth. Meanwhile, rapidly improving private consumption as a driver of growth has come to play a more pronounced role. However, private consumption cannot entirely compensate for the slackening of investment growth, as growth in Chinese incomes has slowed to about 6%. The computed contribution of net exports to growth will be very small during the forecast period, as in recent years.

Sluggish growth and ongoing debt accumulation form a combination likely to cause problems, and the resultant uncertainty is reflected in capital outflows and expectations of a weakening of the yuan on the financial markets. The current account surplus, which dropped to less than 2% of GDP in 2016, has for a long time been insufficient to cover the net outflow of capital, and as a consequence foreign reserves have contracted. This serves to reinforce the vicious circle of capital outflows and downward pressures on the yuan.

The authorities have sought to calm the situation by tightening restrictions on capital movements and interfering in a number of ways in the operation of the foreign exchange markets. In February and March 2017, China's central bank also marginally raised its policy rates. Despite bringing temporary relief, the restrictions have eroded the international credibility and use of the yuan. Increasing the flexibility of the exchange rate (in the final analysis, the floating of the yuan) and bringing more clarity to domestic monetary policy would be a solution for the current deadlock. A system change in the monetary and exchange rate policy regime would naturally give rise to tensions of its own, but it would also force the pursuit of other reforms.

As slower growth and a higher debt burden are hampering the already complex system change, China's development is set to be tinged with a variety of market disruptions over the forecast horizon. A new threat is looming in the form of the freshly inaugurated US administration's potential measures targeted at China.

In order to solve its home-grown problems and strengthen its fundamentals for growth, China would need a determined reform policy. Economic policy, however, has difficulties in keeping pace with the changes in the country. For example, the National People's Congress in March still failed to abandon the 6.5% growth target that is a barrier to economic policy, threatening to aggravate the debt problem and encourage the distortion of statistics. The real willingness and ability of Chinese policymakers to invest in economic reforms will be measured after the party conference in autumn 2017 at the latest, by which time President Xi is expected to have sealed his position via personnel changes made at the party conference.

Japan's growth around 1%

The Japanese economy rebounded slightly in 2016, with GDP 1.0% up on the previous year. There are, however, problems in the sustainability of growth. Firms' good earnings capacity is not reflected in wages and salaries, and labour market negotiations lay emphasis on the importance of durable employment rather than pay increases. Subdued wage inflation, a contracting population and the increasing proportion of pensioners deter private consumption growth and reduce firms' willingness to invest in the home country.

Looking ahead, the Bank of Finland estimates Japanese economic growth to remain at just under 1%, which corresponds to the country's potential output growth. Economic activity in 2017 will be supported by a boost in exports and growth in public consumption. The consumption tax increase due to come into effect in October 2019 will reduce domestic demand towards the end of the forecast horizon. Reversing the trend in the public sector's high indebtedness would require determined implementation of structural reforms.

Japan's inflation will persist only slightly above zero. Despite monetary accommodation, inflation has not increased significantly. The higher price of oil and the weaker yen will create some short-term inflationary pressures, and the consumption tax increase will lead to a one-off inflationary spike towards the end of 2019. Achievement of the targeted 2% inflation rate will, however, require higher wage inflation.

Chart 6.

Russian economy returns to growth

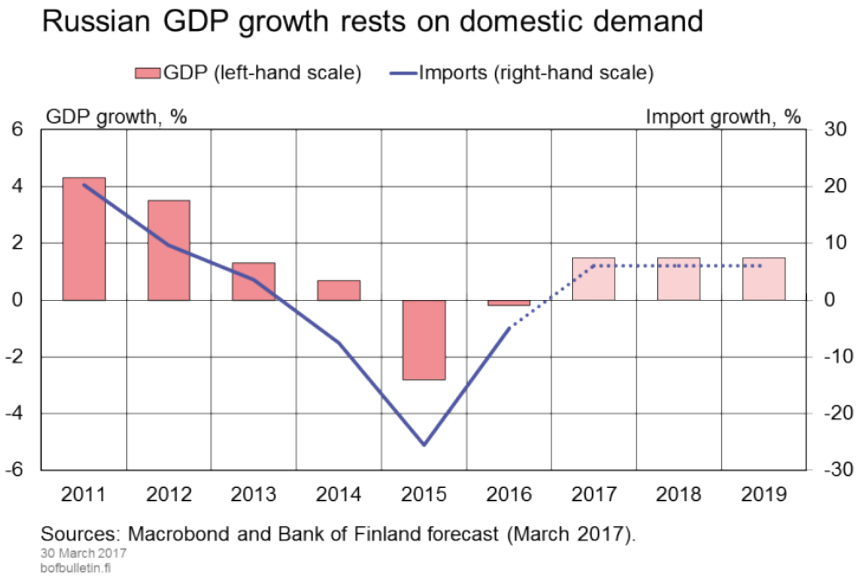
The forecast for Russian GDP growth in 2017 has been slightly upgraded in response to the higher oil price and more favourable developments in the preceding years than predicted. According to the preliminary estimate of the Russian statistical authority, the Russian Federal State Statistics Service, the country's GDP in 2016 contracted by only 0.2%, i.e. by distinctly less than expected on the basis of GDP data for the early part of the year. The projection for GDP performance in 2015 was also revised upwards.

The Bank of Finland expects Russian GDP to move into growth of 1.5% in 2017, and the same rate of growth is also anticipated for 2018–2019, meaning the economy will grow at its potential rate of growth. Growth will rest mainly on domestic private demand, as household consumption in particular is expected to eventually recover somewhat from its deep downward drift. Moderate investment growth is also envisaged. By contrast, public expenditures are expected to contract slightly in accordance with the budgetary frameworks adopted for 2017–2019.

Russian export growth is predicted to remain subdued on the back of both demand and supply constraints. Imports are expected to post growth of 6% following a strong contraction in recent years, bolstered by demand recovery and the robust appreciation of the rouble. Despite imports growing faster than exports, the trade balance is expected to remain in positive territory throughout the forecast horizon.

Oil price movements could slow or speed up growth in Russia compared with projections. Moreover, growth could accelerate if public expenditures were increased, as a deviation from the plans, ahead of the 2018 presidential elections. Instead, growth could be hampered if imports were to emerge from the trough more strongly than expected or if export performance were to prove weaker than forecast.

Chart 7.



Tags

- forecast
- global economy
- gross domestic product
- inflation

ALTERNATIVE SCENARIO

Scenario based on US economic policy plans

TODAY 1:00 PM • BANK OF FINLAND BULLETIN 1/2017 • ECONOMIC OUTLOOK

The economic policy measures planned by the new US administration are geared towards fuelling growth. The form, magnitude and timing of the measures, nevertheless, are still undecided. Their potential effects are, therefore, not captured by the Bank of Finland's baseline forecast for the global economy. The following alternative scenario explores the effects of one potential policy package on total output, the rate of inflation, interest rates and the external value of the US dollar. The broad infrastructure investments scheduled for the following decade, together with concurrent tax cuts for households and businesses, are key elements of the scenario. The assumption of the scenario is that the increase in public spending will be funded by levying taxes on imports and taking on additional debt.

Financing a fiscal stimulus

In this scenario, measures of fiscal stimulus are expected to mainly take the form of infrastructure investments and tax cuts. The election programme of President Trump targeted both privately and publicly funded infrastructure investments in the amount of USD 1,000 billion over the next decade. In addition, the new administration also plans to relax both household and corporate taxes by roughly USD 5,000 billion over the same period.

Furthermore, the new budget proposal contains an increase in defence spending by USD 54 billion annually, to be financed by savings in other public expenditure. According to the Congressional Budget Office, the bill for an American Health Care Act recently introduced by the Republican administration would reduce federal expenditure by USD 337 billion over the coming decade.

According to some proposals[1], the rise in public spending caused by the fiscal stimulus will be funded by the introduction of a border adjustment tax, which would levy a corporate tax of e.g. 20% on US imports, while US exports would be exempt from tax, i.e. US export companies would be paid production subsidies in the amount of e.g. roughly 20%. The border adjustment tax is estimated to raise revenue in the amount of USD 1,000 billion over the next decade[2].

Table 1 shows the effects of these pending economic policy measures on federal revenue and expenditure, assuming that infrastructure investments are publicly funded.

Table 1.

Policy objectives of the new US administration for the next decade, USD 1,000 billion

Revenue		Expenditure	
Border adjustment tax	1	Infrastructure investments	1
Public expenditure savings	0.54	Defence spending	0.54
American Health Care Act	0.34	Tax reform	5

Source: Bank of Finland calculations.

Policy package would spur growth in immediate years ahead

The effects of US economic policy plans can be analysed using a general equilibrium model[3] developed by the IMF (Table 2). Taken together, the measures analysed have a significant upward effect on growth. Fiscal stimulus measures financed by the border adjustment tax pull the pace of economic growth up by a full ½ of a percentage point per annum during the first three years.

1. Proposal of the House of Representatives (Ryan – Brady), see https://waysandmeans.house.gov/taxreform/.
2. The GDP ratios of US exports and imports are 12% and 15%, respectively, which means that the additional revenue raised by the border adjustment tax would amount to 0.2x0.15-0.2x0.12, or around 0.6% of GDP.
3. Kortelainen (2013) Global Integrated Monetary and Fiscal Model, Bank of Finland Bulletin 1/2013.

In the scenario, the Federal Reserve responds by raising its policy rate by more than 1½ of a percentage point, prompting a major appreciation of the nominal trade-weighted exchange rate, by roughly 22%. Notwithstanding this, inflation will pick up by close to a percentage point before gradually moderating.

According to the scenario, private consumption will decline in response to the rise in import prices due to the border adjustment tax. Investments will grow mainly through a reduction in the corporate tax rate. This economic policy package will not improve the external balance of the US economy, given that the current account deficit will grow wider as imports are boosted by the fiscal stimulus. Nor will the economic policy under review generate any substantial savings in expenditure and, consequently, will not resolve the issue of how to maintain fiscal sustainability in the longer term.

Table 2.

Effects of economic policy of new administration on the US economy: deviations from baseline

		Over 3 years, on average
GDP	%, level deviation	2.1
Consumption	%, level deviation	–2.4
Investment	%, level deviation	10.3
Consumer price inflation	% points	0.9
Policy rate	% points	1.7
Current account/GDP	% points	–1.0
Nominal effective exchange rate	%, (–) is appreciation	–21.9

Source: Bank of Finland calculations.

The amount, timing and particulars of fiscal stimulus are surrounded by major uncertainties. Taken together, the measures analysed here have a significant upward effect on growth. However, such an economic policy approach is associated with a considerable risk of increasing protectionism at the global level.

The introduction of a border adjustment tax could trigger instant trade counter measures in other countries. The realisation of these risks could have adverse consequences for the

international economy, gradually rolling back the upward growth effects on the US economy.

Tags

- alternative scenario
- economic policy
- fiscal policy
- USA

Temporary factors have fuelled euro area inflation

TODAY 1:00 PM • BANK OF FINLAND BULLETIN 1/2017 • MONETARY POLICY

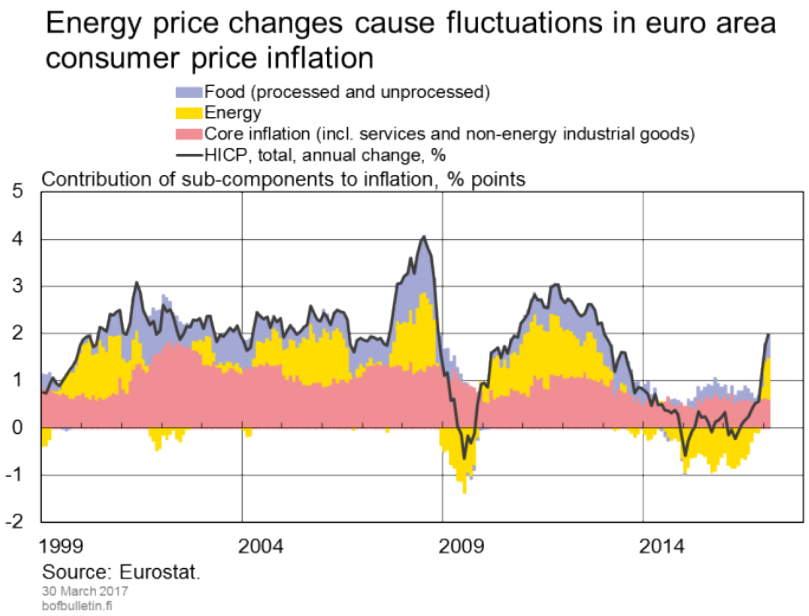
The monetary policy objective in the euro area is to keep inflation as measured according to the Harmonised Index of Consumer Prices below, but close to, 2% over the medium term. This cannot be deemed to have taken place until a sustained convergence of inflation to the objective is achieved and sustained, despite exit from the current very substantial degree of monetary policy accommodation. As the objective is defined for the euro area, on average, inflation in an individual Member State may deviate from the objective. The recent pick-up in inflation has been due mainly to temporary factors.

Euro area's internal cost pressures reflected in core inflation

Inflation measured according to the euro area Harmonised Index of Consumer Prices (HICP) can be broken down into core inflation (about 71% of the total index) and the sub-components of energy (about 9.5% of the total index) and food (about 19.5% of the total index). It is advisable to conduct a separate analysis of the impact of energy and food on headline inflation, as their prices fluctuate greatly and often sporadically, for example according to supply. Supply may be affected by factors such as regulation of oil output volumes, or weather conditions in the case of unprocessed food. Euro-denominated world market prices of commodities are also influenced by exchange rate developments.

Core inflation, covering price developments in services and non-energy industrial goods, reflects the euro area's internal cost pressures better than inflation including energy and food sub-components. For this reason, in assessing the medium-term evolution of inflation, it is also worthwhile to look at core inflation.

Chart 1.



If we examine the contribution made by the sub-components of the consumer price index to the inflation rate, we can see that the impact of energy prices has displayed strong variation (Chart 1). By contrast, throughout the review period as a whole, i.e. from 1999 to early 2017, core inflation contributed much more evenly and positively to the inflation rate, in other words it exerted an upward impact on headline inflation. The chart also shows that inflation accelerated to about 2% at the beginning of 2017, mainly as a consequence of an increase in the inflation rate of energy and, in part, food. Meanwhile, core inflation in recent years has been below 1%, which is considerably lower than its average since the introduction of the euro (about 1.4%).

Base effect has boosted energy price inflation

The inflation rate is measured as an annual change in the price index relative to the previous year's base period. For example, energy price inflation in January 2017 is affected by the level prevailing in January 2016.

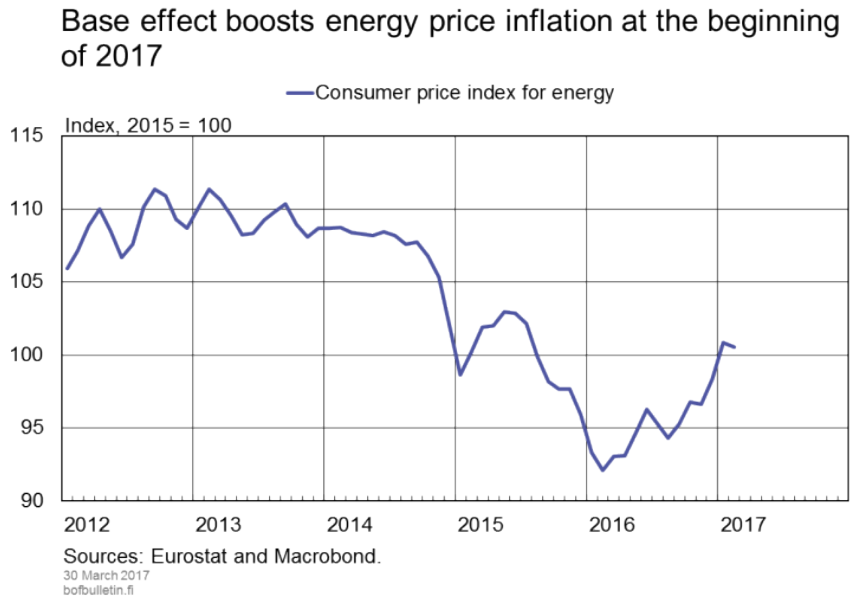
In analysing the consumer price index for energy (Chart 2), we find that in the base period, i.e. at the beginning of 2016, it was much lower than at the beginning of 2017. The reason for this is the exceptionally low price of oil in early 2016.

Therefore energy price inflation at the beginning of 2017 was very strong (around 8%), although the prices included in the energy component have no longer risen in recent months. This phenomenon is known as the base effect. If the energy price index were to remain permanently at its current level, energy price inflation would be notably positive in 2017. After this, however, low prices in the base period would drop out of the inflation measures, meaning that in 2018 energy price inflation would be zero.

Given that energy has around a 9.5% weighting in the consumer price index, the direct impact of energy price increases on the rate of inflation in early 2017 is about 0.8 of a

percentage point. If the price of oil remains stable, the upward impact of energy prices on headline inflation will fade towards the end of 2017.

Chart 2.



Second-round effects may spur inflation for a longer period

Oil price movements are reflected in inflation not only via direct effects but also indirectly through factors other than energy prices. Higher energy prices are reflected in, for example, transport costs. Although the indirect effects on inflation from oil price changes often unfold with a time lag, they are in most cases temporary. If a temporary pick-up in inflation driven by a rise in the price of oil leads to wage increases, this is a question of second-round effects[1] that may cause inflation to accelerate for a longer period.

Domestic cost pressures in the euro area have so far been subdued on the basis of realised wage inflation indicators. Any signs of effects on wages from a temporary quickening of inflation will, however, need to be closely monitored. As long as the upward impact on inflation from oil price movements is estimated to remain temporary, the phenomenon can mainly be considered a change in relative prices, to which there is no need to respond by modifying the monetary policy stance.

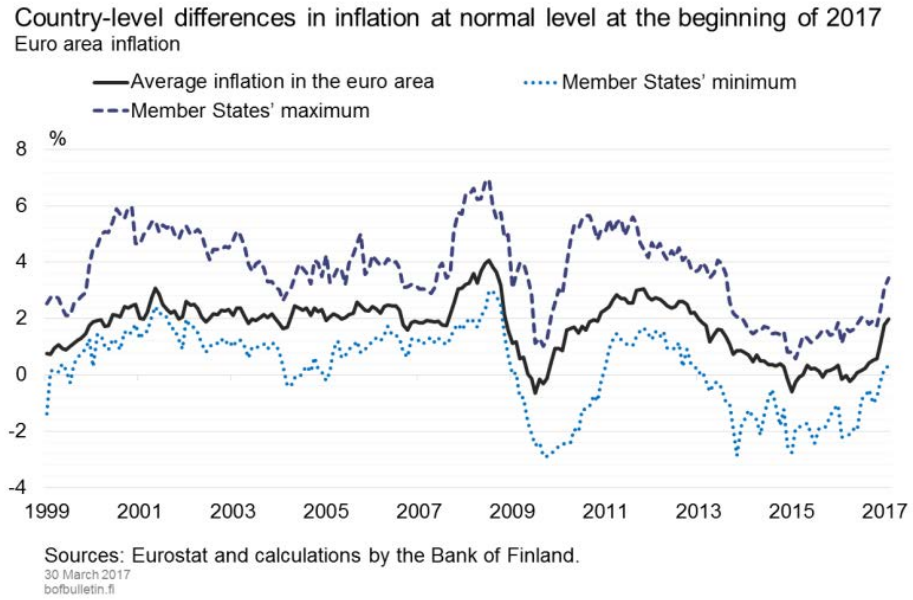
Cross-country variation in inflation rates

Average euro area inflation includes different rates of inflation at the country level. The differences reflect disparities in domestic cost pressures across Member States and, for

1. Direct effects, however, manifest themselves faster than indirect and second-round effects and therefore are also more easily discernible. See ECB (2010) Oil prices – their determinants and impact on euro area inflation and the macro economy. Monthly Bulletin. August.

example, the diverse effects of oil price changes and exchange rates.[2] The recent dispersion in country-level inflation rates does not appear to be exceptionally large (Chart 3).

Chart 3.



Country-level differences in consumer price inflation are connected with the evolution of cost-competitiveness. Cost-competitiveness means the development of labour costs relative to firms' ability to pay wages compared with trading partners. Cost-competitiveness can be measured in terms of several different indicators, such as unit labour costs, which gauge the evolution of wages relative to productivity. See 'Measuring cost-competitiveness in Finland'. LINK

Since 1999 euro area average unit labour costs have increased at a good 2% rate. During the past twelve months, however, growth in unit labour costs has been only around 1% on average. A rate of increase in unit labour costs that is slower than the euro area average improves an individual euro area country's cost-competitiveness. Thus, if the country's initial cost-competitiveness is weak, this will support an adjustment process remedying the economy's internal and external imbalances. See 'Recent developments in Finland's cost-competitiveness' [LINK].

Tags

- base effects
- euroarea inflation

2. See e.g. Vilmi (2015) Inflation developments in the euro area — an update. Quarterly report on the euro area. Vol. 14, No 3, 29–33. European Commission.

Frequency of rising and falling prices in the euro area

TODAY 1:00 PM • BANK OF FINLAND BULLETIN 1/2017 • MONETARY POLICY

Euro area inflation accelerated notably in December 2016 and January 2017. This mainly reflected price increases caused by constraints in the supply of energy products and unprocessed food. In fact, the development of core inflation, excluding these items, still remained subdued. In addition, the rate of change in the prices of goods and services included in core inflation has remained slow. Sluggish core inflation and the rigidity of relative prices included therein suggest that euro area inflation is not picking up so as to exceed the price stability objective.

The elasticity of relative prices constitutes a key element of the dynamics of the economy. In an environment of low inflation, this is manifested in a decline in some nominal prices. If there is no downward elasticity in nominal prices, relative prices will become sticky and the functioning of the price mechanism will weaken. The euro area inflation target of almost 2%[1] leaves scope for moderate changes in relative prices without any need for major declines in nominal prices.

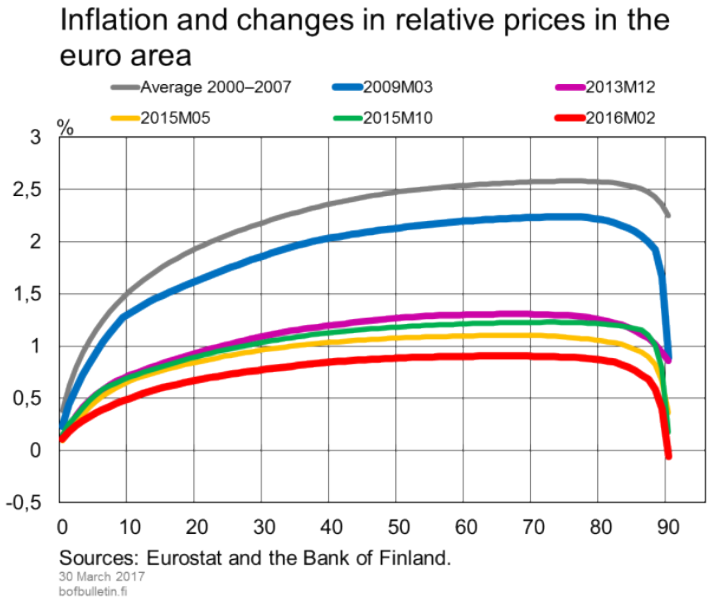
In order to calibrate the appropriate monetary policy response, it is important to be able to assess how the causes of current and expected inflation are broken down into supply and demand factors. Factors relating to aggregate demand have an impact on the general price level or the rate of change therein. For example, fiscal and/or monetary accommodation boosts aggregate demand, which leads to a rise in the general price level, i.e. higher inflation.

1. The Eurosystem aims at annual inflation, measured in terms of the Harmonised Index of Consumer Prices, of below, but close to, 2%.

Supply factors, in turn, are basically translated into changes in relative prices. A contraction in oil supply, for example, raises the price of oil, thus triggering a pick-up in inflation. The significance of such accelerating inflation stemming from a change in relative prices depends materially on whether it will lead to second-round effects via higher pay demands. In practice, supply and demand shocks affect each other, and it may be hard to distinguish between them in real time.

Low inflation does not automatically mean that relative prices are sticky. The same inflation rate may mask very different trends in relative prices. Euro area inflation at the initial stage of the financial crisis in March 2009 was broadly the same as at the turn of 2013–2014 (Chart 1). Despite this, differences in the rate of change in relative prices were very large. In March 2009, rising prices made a large contribution to inflation, and the slowing of inflation was due to declines in only some prices (mainly for energy products). In December 2013, the contribution of rising prices had diminished, and the frequency of declining prices was high. The functioning of the price mechanism had apparently weakened (Chart 1).[2]

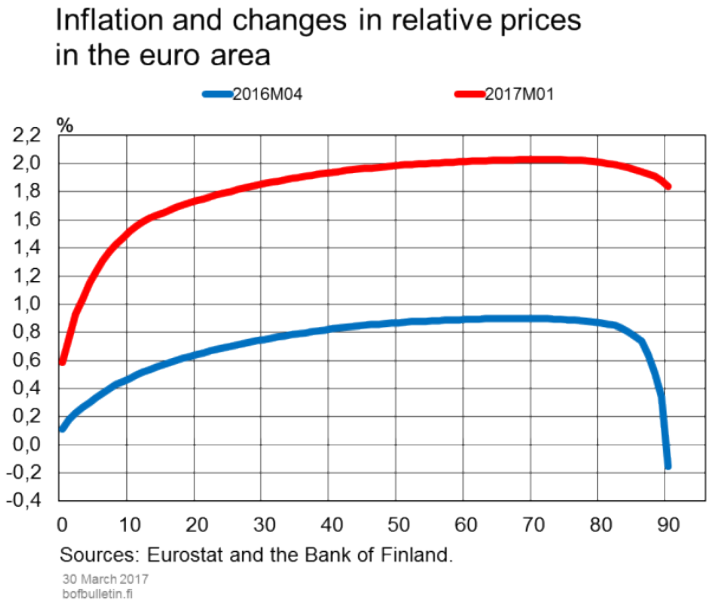
Chart 1.



2. The curves presented in the chart include information on changes in the prices of 91 goods in the consumer price index during the past 12 months and the weights assigned to these goods. Each curve was obtained by placing the contributions to inflation (= the product of price change and weight) of individual goods in order of magnitude and calculating from these a cumulative sum. In other words, the component whose price change makes the largest positive contribution to the rise in the price index is placed first on the left. To this is added the second largest positive contribution. This will be continued until the area of declining prices is reached. At first, the component having the smallest downward impact on the rise of the price index is added to the cumulative sum. This will be continued until, finally, the largest negative contribution is added to the sum. The cumulative sum of contributions thus organised will end up with a figure that equals the rate of change of the total consumer price index. With the contributions of the components of the consumer price index thus placed in order of magnitude and their cumulative sum calculated, we can draw a curve that simultaneously provides both an overall picture of the frequency of rising and falling prices and the rate of change in the total price index.

An examination of recent euro area inflation and changes in relative prices, i.e. during the course of 2016 and early 2017 (Chart 2), reveals that, along with accelerating inflation, the proportion of rising prices and their contributions have grown between April 2016 and January 2017. Meanwhile, the proportion and contributions of falling prices have diminished considerably.

Chart 2.



As late as April 2016, the contribution of rising prices to inflation was in the region of 0.9 of a percentage point (the peak of the curve), and at the same time declining prices and their contributions were considerable (the falling part of the curve). In January 2017, the contribution of rising prices had increased to about 2.0 percentage points, while the proportion and contribution of falling prices had contracted markedly.

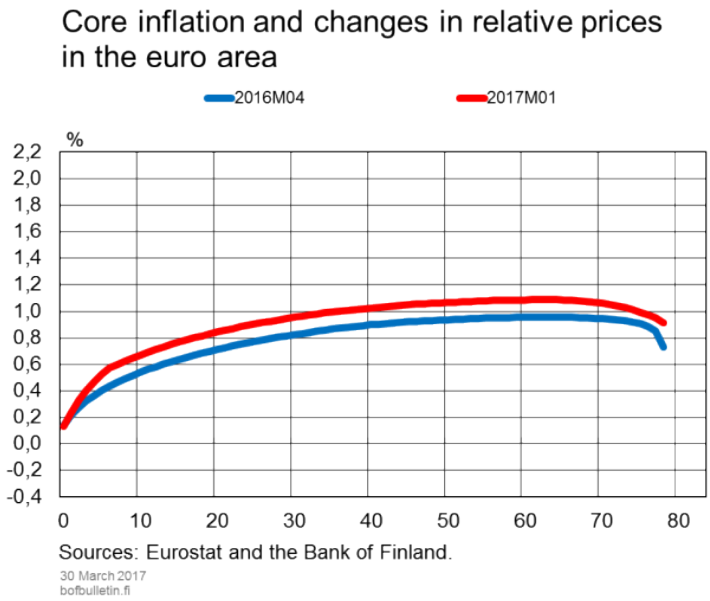
The difference between these two points in time is largely accounted for by the price increase in January 2017 resulting from constraints in the supply of energy products and unprocessed food: in the case of energy products by oil producers' willingness to regulate output volumes, and in the case of unprocessed food by weather conditions restricting agricultural and horticultural production.

Core inflation (Harmonised Index of Consumer Prices, HICP excl. energy and unprocessed food), however, continued its very subdued trend in December and January. In addition, the rate of change in the relative prices of goods and services included in core inflation has remained slow.

The proportion and inflation contributions of rising prices remained almost unchanged in 2016 and in January 2017 (Chart 3). In April 2016, the contribution of rising prices was about 1.0 percentage point and in January 2017 about 1.1 percentage points. The proportion and contributions of falling prices also remained practically unchanged. In April 2016, their contribution to inflation was about -0.2 of a percentage point and in January 2017 also about -0.2 of a percentage point.

Sluggish core inflation and the rigidity of relative prices suggest that euro area inflation is not picking up so as to exceed the objective for an extended period of time.

Chart 3.



Tags

- change in relative prices
- inflation
- price stability

Euro area money markets undergoing huge changes

TODAY 1:00 PM • BANK OF FINLAND BULLETIN 1/2017 • MONETARY POLICY

Regulation, risk awareness following the financial crisis, and an accommodative monetary policy have in recent years brought changes to the euro area money markets. Trading has changed from uncollateralised to collateralised lending, and the differences in interest rates between different instruments have grown. Changes in monetary policy interest rates affect market interest rates via the money markets, and therefore the central banks in the Eurosystem closely follow the developments of the money markets.

The term 'money markets' refers to the wholesale trading of debt instruments with a maturity of less than 1 year, which are traded particularly by banks and other financial institutions. This is a market for very short-term trading with maturities of one day to one week. The instruments traded are relatively secure and liquid, such as uncollateralised and collateralised deposits, repurchase agreements (repos)[1], and short-term debt instruments issued by central governments and corporations. Money market activities affect the funding and cash management of individual financial institutions. Possible disruptions in the money markets are also more widely reflected on the financial markets and in financial intermediation.

The euro area money markets stabilised after the financial and debt crisis, and trading has been buoyant in recent years. The volume of money market deals by the nearly 100 'panel banks' alone amounted to more than EUR 1,000 billion a day according to a 2015

1. In the repo market, counterparty A sells a security (for example a government bond) to counterparty B for the price of e.g. 99 and promises to buy it back after, for example, three days for the price of e.g. 100.The price gap determines the interest rate of the deal. In practice, repos are thus collateralised deposits and one of the safest ways of investing excessive cash funds. Typically the sales price of the security is a little lower than its real market value, i.e. a haircut is applied to the value of the security.

survey.[2] However, the structure of the money markets has changed significantly compared with the period before the financial crisis, as trading on the uncollateralised money markets has decreased, while correspondingly trading on the collateralised money markets has strongly increased. These developments are due to, among other things, regulatory changes that do not encourage banks to engage in short-term, particularly uncollateralised, funding.[3] At the same time market participants' risk awareness has grown and government credit ratings have declined. These factors have, in turn, brought about a fragmentation of the money markets into core and peripheral economies.[4]

Traditionally the differences between Euribor and OIS (overnight index swap)[5] interest rates have been used as risk indicators for the uncollateralised money market, and after the euro area debt crisis the indicators have remained stable since 2013 (Chart 1). However, right now the change in market situation is reflected in differences between other short-term interest rates.

If monetary policy transmission is effective, short-term market interest rates react to short-term monetary policy expectations. With its policy interest rates, the central bank steers the shortest market rates – for the last two years the overnight interest rate Eonia, for example, has been very close to the ECB deposit facility rate, which now is -0.40%. Correspondingly, the OIS interest rates are the best indicator of the expectations of the interest rate policy of the central bank, and as a rule they also efficiently steer euro area money market interest rates and the most short-term lending rates of the euro countries (Chart 2). These interest rates have typically diverged from each other only in crisis situations.

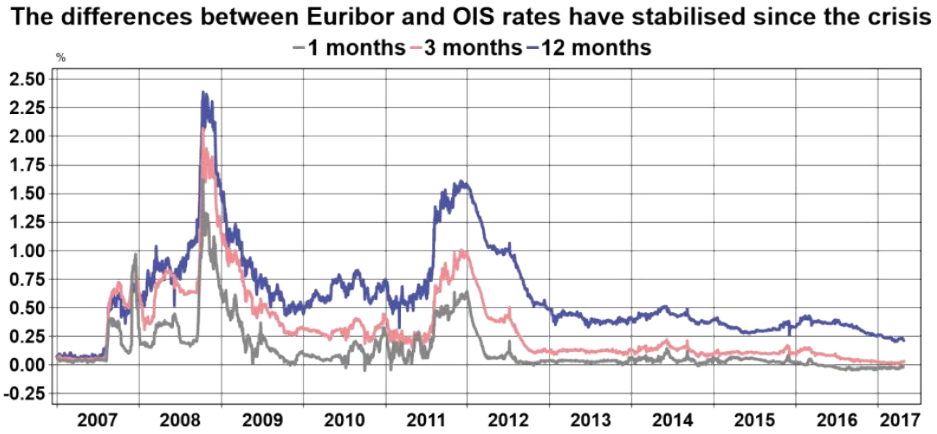
2. Nearly about half of the amount comprises collateralised deals, while a few percentages represent uncollateralised deals. The rest consists of interest rate and exchange rate derivatives. See the European Central Bank (2015).

3. Of the regulatory reforms aiming at stability of the banking system in the next few years, the liquidity coverage ratio (LCR), net stable funding ratio (NSFR), leverage ratio (LR) and capital ratio have at least in theory preventive effects on money market trading. However, all of these are not yet in force. See Doran et al. (2014).

4. See Heijmans et al. (2016).

5. An OIS is a derivative contract according to which one contracting party pays the fixed interest rate and the other pays the average overnight interest rate for the maturity of the contract. Thus, based on the prices of the euro-denominated OIS contracts, we can conclude the level of the Eonia rate, over the contract maturity, expected by the market.

Chart 1.



Differences between Euribor interest rates and overnight index swaps (OIS) in different maturities.
The difference shows the credit and liquidity premia required on the uncollateralised money markets.
Source: Bloomberg.

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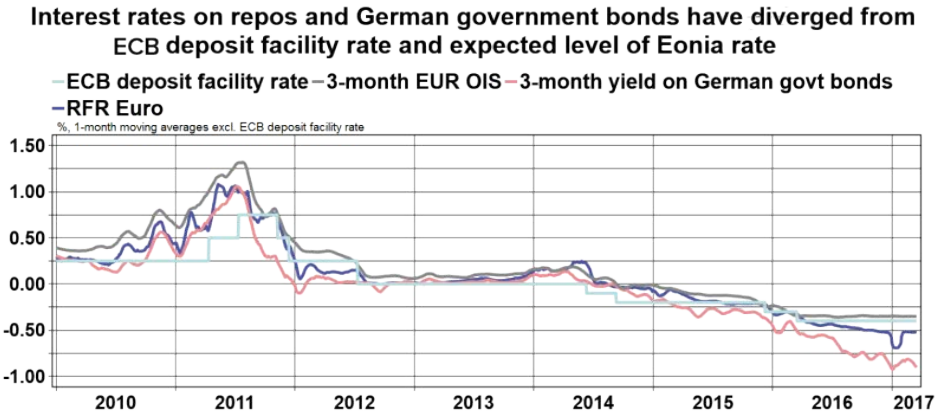
Chart 2.



The OIS rate shows expected average overnight rate (Eonia) over a given period.
The euro area repo funds interest rate (RepoFunds Rate: euro area, RFR Euro) shows average interest rate in repo trading with euro area government bonds on selected trading platforms.
Sources: Macrobond and Bloomberg.

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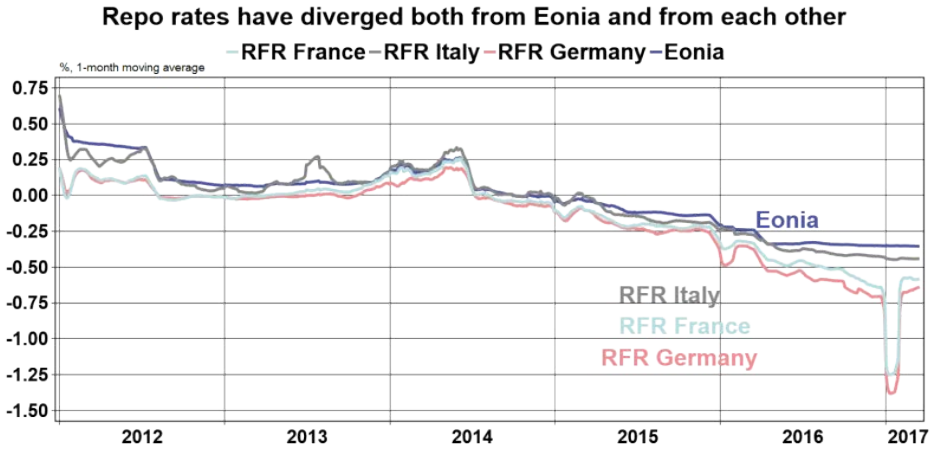
However, in the last few years the interest rates on repos and German government bonds have even dropped below the ECB deposit facility rate and the Eonia rate. Categorising the interest rates according to the collateral used shows that the repo rates have also diverged from each other (Chart 3). In order to receive a German government bond as collateral for a short-term deposit, an investor must make the deposit at an interest rate of around -0.70%. With French and particularly Italian government bonds as collateral, interest rates are higher, i.e. less negative. As banks were optimising their balance sheets at the turn of the year, high-quality collateral securities were in particularly high demand and the repo rates of the core euro area countries were temporarily as low as -5%. In earlier years, the view was that deposits were sold against collateral on the repo market, but now collateral is bought against deposits.

Chart 3.



Repo funds interest rates by country show interest rate levels for repo trading with specified government bonds as collateral.
Source: Bloomberg.

16 March 2017
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The interest rate development described above is at least due to investors' wish to protect themselves against political risks in the euro area and a general shortage of high-quality collateral material.[6] In addition to the above-mentioned regulatory reforms and risk awareness, the expanded asset purchase programme (EAPP) of the Eurosystem also contributes to the shortage of collateral. The programme not only adds excess liquidity to the market, it also removes from the market high-quality securities eligible as collateral. In order to facilitate the functioning of the repo market, the Eurosystem in early 2017 introduced lending of its security holdings also against cash collateral.

Since the nature of at least some of the drivers of change in the repo markets is structural, the change in the money markets will scarcely be only temporary. Despite the shortage of collateral, the repo market still functions fairly well and prices are flexible – the trading volumes, for example, have remained almost unchanged or even grown. However, repo rates are exceptionally low, and market participants are only just growing accustomed to the new environment, so the situation will be closely followed in the Eurosystem going forward.[7]

Sources:

Baranova, Y. – Liu, Z. – Noss, J. (2016) The role of collateral in supporting liquidity. Staff Working Paper No. 609. Bank of England.

Doran, D. – Kierrane, C. – Masterson, M. (2014) Some Implications of New Regulatory Measures for Euro Area Money Markets. Quarterly Bulletin 01 / January 2014. Central Bank of Ireland.

6. Collateral is needed to, for example, acquire funding and cover derivative positions. Long 'chains' are typical in the use of collateral, and according to Baranova et. al (2016) a high-quality collateral security circulates via about four intermediaries before it ends up at its final destination. Singh (2016), for example, emphasises the significance of collateral for the functioning of the whole financial system and for ensuring financial growth.
7. See Mersch (2017).

European Central Bank (2015) Euro Money Market Survey.

Heijmans, R. – Heuver, R. – Gorgi, Z. (2016) How to monitor the exit from the Eurosystem's unconventional monetary policy: Is EONIA dead and gone? DNB Working Paper No. 505/March 2016.

Mersch, Y. (2017) Ructions in the repo market – monetary easing or regulatory squeezing? Speech on 26 January 2017.

Singh, M. (2016) Collateral and Financial Plumbing. Risk Books.

Tags

- liquidity
- money markets
- repo markets

Have market inflation expectations strengthened?

30 MAR 2017 11:00 AM • BANK OF FINLAND BULLETIN 1/2017 • MONETARY POLICY • TOMI KORTELA

- Tomi Kortela
  Senior Economist

Financial market inflation expectations are often measured by inflation swaps. Estimated on this basis, euro area inflation expectations have been increasing since autumn 2016. Interpretation of inflation swaps is not, however, straightforward. Closer scrutiny shows that market inflation expectations have strengthened by less than could be judged by examining mere swap prices.

Risks involved in straightforward interpretation of inflation swaps

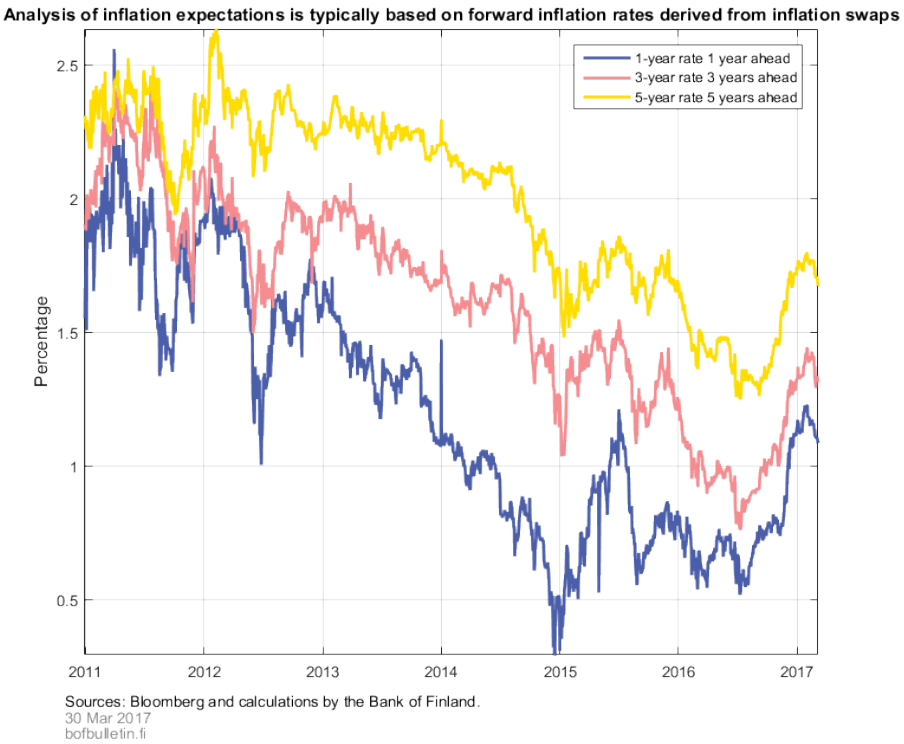
Inflation expectations play a key role in determining inflation, as expectations of future inflation are reflected in current prices.[1] For this reason, central banks monitor closely the evolution of inflation expectations. Inflation expectations can be measured in many different ways: via surveys, by examining inflation forecasts or by measuring inflation expectations on the basis of financial instruments. If financial market prices are used for

1. Expectations affect inflation, as prices in the economy are typically changed at long intervals, owing to costs involved in price modifications. Expectations of future price developments must therefore be taken into account when setting current prices. In addition, wages and salaries are normally agreed for a longer period at a time, and expected inflation will then be reflected in the wage level, as households want to safeguard their purchasing power. Wages and salaries constitute a key cost factor for firms, whereby changes in wages and salaries are reflected in prices and actual inflation.

measuring, we refer to market-based inflation expectations. Inflation expectations on the euro area markets are often measured by inflation swaps.[2]

The development of expected inflation inferred from (inflation) swaps is typically surveyed by monitoring different forward inflation rates (Chart 1). Forward inflation describes average inflation derived from swap prices over a given future horizon. For example, the 'two-year one year ahead' forward inflation rate illustrates average two-year inflation when the calculation of average inflation begins one year from today.

Chart 1.



Expected inflation inferred from swaps has accelerated since autumn 2016 (Chart 1). As swaps are, however, relatively complex securities, the information extracted from them must be interpreted with caution. Upon examination of recent developments in euro area inflation expectations, at least three factors need to be taken into consideration.

Firstly, short-term forward inflation rates over very long horizons (e.g. one-year inflation nine years ahead) are sensitive to small changes in long-term swap prices. For example, pricing or measurement errors may lead to considerable changes in these types of forward inflation rates.

2. An inflation swap is a derivative subject to trading on the financial markets and can be used to provide protection against uncertainty about future inflation. One of the parties to a swap agreement pays a pre-determined amount on the due date, whereas the other party's payment depends on inflation developments during the life of the swap. The structure and characteristics of inflation swaps are illustrated more closely in the Bank of Finland Bulletin 4/2016.

Secondly, it is difficult to observe the path of expected inflation on the basis of forward inflation curves over different horizons, as the inflation rates indicated by the curves are, in part, overlapping or fail to cover all periods. Moreover, when the markets expect a pick-up in inflation, forward inflation will also accelerate over time. In such a case, a change in forward inflation does not necessarily mean a change in inflation expected by the markets.

Thirdly, swap prices reflect the compensation required by investors for bearing the risk related to inflation. As the riskiness of a swap is also affected by factors other than expected inflation over the life of the swap, the swap price may differ from the rate of inflation expected by the markets. Such components having an impact on the price of a security are called premia. Changes in inflation expectations derived directly from swap prices may, in fact, mirror changes in premia, rather than changes in inflation expected by the markets.

Interpretation of expectations can be improved by modelling the term structure of swaps

The above examples demonstrate that forward inflation inferred from swap prices needs to be interpreted with caution. Such interpretation-related risks can be assessed by modelling the term structure of inflation swaps. This means the reciprocal relationship of prices of swaps with different maturities. If we take this term structure into account, we can obtain more information on inflation expected by the markets than by only monitoring individual swap prices. This approach has many advantages.

The term structure model enables calculation of inflation expected by the markets, based on a large array of swap prices. This path of expected inflation is affected by a number of swap prices, and in the calculation there is no need to choose which swap prices are to be used for capturing market expectations. As a consequence, measurement errors related to individual swaps have only a limited effect on the results.

Another key advantage is that the model enables assessment of the size of premia related to swap prices. Even if estimates from such models are only indicative, they help perceive the significance of premia in inflation expectations.

In other words, the results given by the term structure model of inflation swaps allow the assessment of risks related to the interpretation of expectations derived directly from swap prices. The question as to whether market inflation expectations have increased can thus be answered with greater certainty.

The modelling of swap prices can mainly be approached in the same manner as the modelling of interest rates. In this analysis, the model chosen is a typical term structure model of interest rates, which is known as an arbitrage-free dynamic Nelson-Siegel model.[3] On the basis of three time-varying factors, the model seeks to account for prices

3. Insights into models of this type are offered by Diebold and Rudebusch in Yield curve modelling and forecasting (2013). Princeton University Press.

of swaps with different maturities in such a way that swap pricing at one point in time imposes absence of arbitrage – i.e. there is no possibility of gaining risk-free profit.

The modelling of the term structure of inflation swaps differs in two respects from the modelling of the term structure of interest rates. Firstly, in practice, only swaps with full-year maturities can be used in the modelling. This is because seasonal variation in inflation would lead to considerable price volatility in swaps with maturities other than full years, which would hamper the modelling exercise. Secondly, in the modelling, forward inflation rates must be used, as swap prices are subject to so-called calendar effects.[4]

Term structure model makes it possible to obtain a consistent picture of inflation expectations

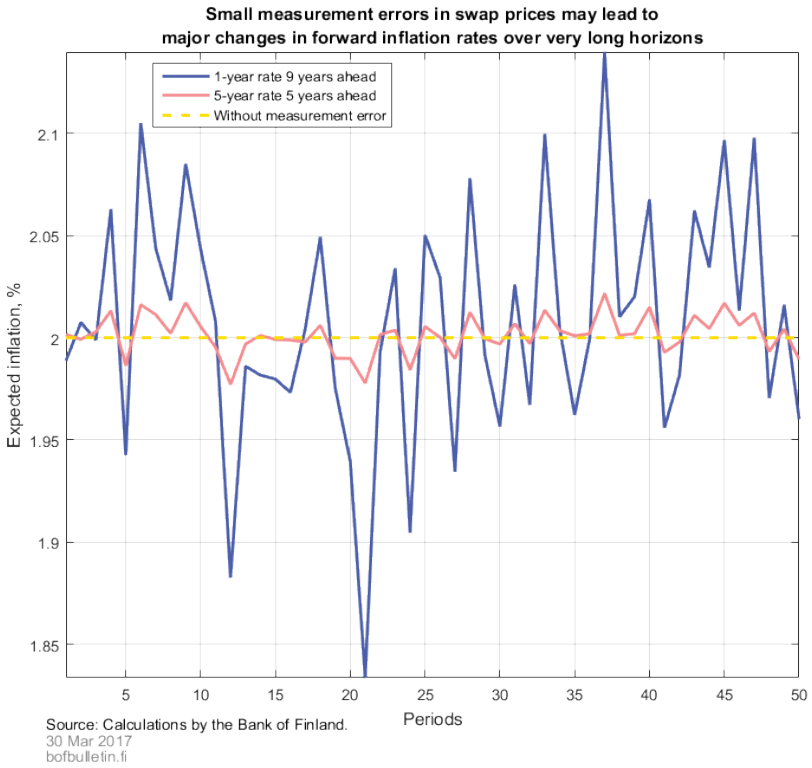
Trading in inflation swaps takes place off exchange on an over-the-counter basis, directly between the parties involved. Firms providing financial market information collect price data on the basis of transactions made. The prices so obtained can, however, include measurement errors; in other words, they do not necessarily correspond to real market prices, but are estimates thereof.[5]

Inflation swap markets are highly sophisticated, with significant market turnover, meaning that measurement errors related to prices are in most cases small. The problem is that short-term forward inflation rates over very long horizons are sensitive to even minor measurement errors.

Next, we examine a situation (Chart 2), in which all swap prices are without measurement error 2%, whereby forward inflation rates over the various horizons are likewise 2% (the yellow broken line in the chart). The chart also presents two forward inflation rates over different horizons (1-year rate 9 years ahead and 5-year rate 5 years ahead), on the assumption that measurement errors related to prices are identically and independently normally distributed and the standard deviation of the measurement errors is one basis point, i.e. 0.01 of a percentage point.[6]

4. For more information on calendar effects, see Bank of Finland Bulletin 4/2016.
5. Measurement errors can emerge, due, for example, to the nature of trading and liquidity differentials in swaps.
6. The actual swap price is thus 2%, but with an error of the size of the standard deviation of the measurement error it would be 2.01%.

Chart 2.

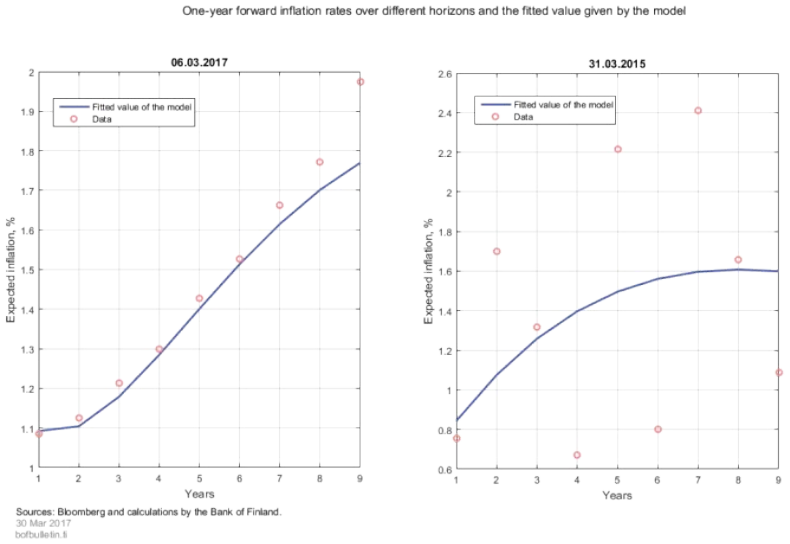


Our examination shows that the value of short-term (one-year) forward inflation over a very long horizon (9 years ahead) is highly sensitive to relatively small measurement errors (Chart 2). Even small measurement errors result in errors of more than 0.10 of a percentage point in forward inflation. Errors of this size can be deemed significant, as measurement errors may in certain situations lead to misinterpretation of changes in inflation expectations.

This characteristic, however, applies only to very short-term forward inflation over a very long horizon. In fact, the typically used '5-year 5 years ahead' forward inflation rate gives almost unbiased results. For example, typical values of forward inflation – as in Chart 1 – are not sensitive to minor measurement errors; the problem only concerns less frequently used forward inflation rates over very long horizons.

The impact of potential measurement errors on longer-term forward inflation rates can be removed by using information extracted from all swaps, i.e. the information provided by the term structure of forward inflation rates, for the modelling of inflation expectations (Chart 3).

Chart 3.



In the left-hand panel (Chart 3), the circled values of forward inflation on 6 March 2017 can, in the current environment, be considered as representing a typical term structure of inflation expectations. The chart depicts 1-year inflation 1–9 years ahead: for example, the observation at 5 years is roughly speaking 1-year inflation 5 years ahead as expected by the markets, i.e. inflation in 2022. In addition, the fitted value of the model (the line in the chart) has been set as close to the observations as possible on condition that the prices based on the fitted value incorporate no opportunity for risk-free profit.

Short-term forward inflation rates are highly consistent with efficient pricing – i.e. the difference between the observations and the fitted value is small (Chart 3). This supports the idea of efficient markets, but longer-term forward inflation rates appear to deviate from the fitted value. The difference may be due to a number of factors – such as the poor fit of the chosen model for the data – but the most likely cause is a small measurement bias in the data. This conclusion is underpinned by the fact that the difference is significant expressly in forward inflation rates over very long, i.e. 9-year horizons, which are exposed to measurement errors, as discussed above.

The fitted value of the model also enables examination of long-term forward inflation rates. The fitted value calculated with the model is not based on the prices of two swaps (as the observations in the chart are), but on the entire term structure of swaps. Accordingly, the model's fitted value can be deemed as giving a consistent picture of market inflation expectations, also in respect of long-term forward inflation, as the fitted value is based on information from several observations. This prevents any measurement errors in the data from leading to wrong interpretations of the inflation expected by the markets.

In some contexts, the fitted value of a model is the only way of examining market inflation expectations. This is the case, for example, when swap prices observed on the markets fail to provide a credible path for inflation (the right-hand panel in Chart 3).[7] It is a situation in which the markets are unable to form a picture of future inflation. The reason for this may be that the markets need some time to process new information

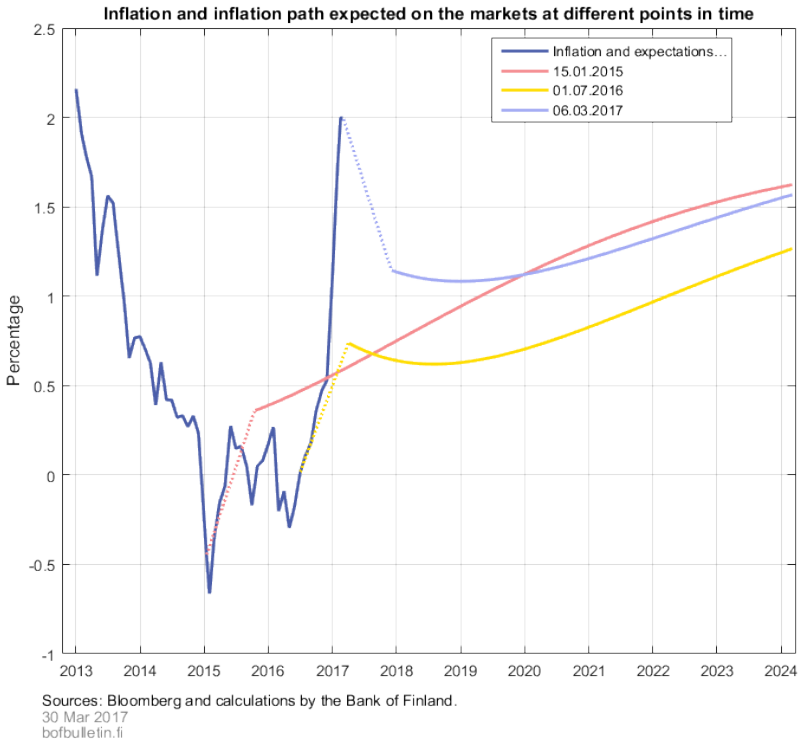
received. In such cases, the fitted value is still able to produce a credible picture of market inflation expectations. These exceptions are relatively rare, but show that the use of a model's fitted value in exploring inflation expectations gives a consistent picture of market expectations in different situations.

Term structure model enables calculation of inflation path expected by the markets

A typical way of analysing market-based inflation expectations is to monitor cross-temporal developments in forward inflation rates over different horizons (see Chart 1). In such analyses, inflation expectations are often overlapping in part or fail to incorporate all periods, rendering it hard to capture the inflation path expected by the markets. Furthermore, as forward inflation rates measured at different points in time naturally illustrate expected inflation over different periods of time, comparison of forward inflation values over different horizons is not straightforward.

Using the term structure model of inflation swaps, we can calculate the path of expected inflation inferred from swap prices. As this path gives one value of expected inflation for each point in time, such paths are mutually comparable (Chart 4).[8]

Chart 4.



7. Forward inflation rates indicate the markets expected inflation to be about 0.7%, 2.2% and 0.8% in 2019, 2020 and 2021, respectively. This is not a credible path.

8. Inflation swaps are linked to an index with a lag of three months; hence, for example, a 1-year swap predicts inflation over a period of 9 months. This 9-month period is illustrated by the broken line in Chart 4.

In early March 2017, the markets based their pricing on inflation of about 1.1% at the beginning of 2019, from which inflation was expected to accelerate steadily to slightly over 1.5% by the end of 2024 (Chart 4). Inflation expectations have risen significantly since July 2016, when they were 0.6% and 1.3%, respectively. Upon examination of inflation paths (Chart 4), we thus arrive at the same interpretation as in connection with monitoring individual forward inflation values (Chart 1): inflation expectations have strengthened recently. However, in analysing inflation expectations with the help of the path of inflation expected by the markets (Chart 4), we can more easily consider market expectations in relation to, for example, current inflation and other inflation forecasts than in the case of a review based on individual forward inflation rates (Chart 1).

Our examination based on inflation paths explicitly shows that the markets continue to expect relatively subdued inflation far into the future (Chart 4). Three years ahead, market pricing for inflation is still below 1.5%. Consequently, despite higher inflation expectations, the markets do not expect any significant increase in inflation in the immediate years ahead. This becomes clearly visible if we explore the expected inflation path as a whole (Chart 4) rather than individual forward inflation rates (Chart 1).

We can also see that in mid-January 2015 the long-term inflation expectation was nearly the same as in March 2017: the inflation path expected by the markets for 2021–2024 is almost the same at these two points in time (Chart 4). If the same analysis is conducted using 3-year forward inflation 3 years ahead, the result is not the same: forward inflation was 1.0% on 15 January 2015 and correspondingly 1.3% on 6 March 2017 (Chart 1). Thus, if an individual forward inflation rate is used for comparing longer-term inflation expectations, the expectations appear to have strengthened by 0.3 of a percentage point, although in reality long-term inflation expectations appear to be practically the same (Chart 4).

The difference in the results stems from the fact that forward inflation for January 2015 measures average inflation in 2018–2021, but the corresponding forward inflation for 2017 measures average inflation over the period 2020–2023. Accordingly, longer-term comparison of forward inflation rates is not straightforward, as they describe different periods of time. Straightforward analyses may arrive at wrong conclusions of the behaviour of long-term inflation expectations. Therefore, besides examinations based on forward inflation rates, it is advisable to also look at the path of expected inflation on the markets. It is particularly useful to conduct such an analysis if comparisons are to be made between longer horizons.

Volatility in premium size changes inflation expectations derived from swap prices

Inflation swap prices reflect compensation required by investors for bearing the risk related to inflation. As the riskiness of a swap can also be affected by factors other than expected inflation over the life of the swap, the swap price may differ from the rate of inflation expected by the markets. Such components having an impact on the price of a security are called premia.

Premia are a reflection of the risks inherent in swaps, which may be a consequence of the liquidity or maturity of a swap, for instance. The size of premia fluctuates over time, and they are of different size for swaps with different maturities; hence, swap price movements are due, in part, to changes in these premia rather than changes in the inflation expected by the markets.

In the above discussion, the significance of premia in swap prices was disregarded, and prices were considered to merely reflect expected inflation. This can be justified in two ways.

Firstly, if market participants are assumed to be risk-neutral and the markets to be efficient, no premia exist on the markets. As risk-neutral market participants require no compensation for bearing risks, swap prices can be directly interpreted as representing market inflation expectations. For this reason, expectations derived directly from swap prices are understood to mean expectations under risk-neutrality. As a rule, market participants' behaviour does not support the assumption of risk-neutrality. In practice, premia do have some impact on swap prices.

Secondly, if the premia are small, the price of a swap can be thought to directly mirror the inflation expected on the markets. In general, however, premia are assumed to fluctuate significantly over time on the financial markets.

The size of premia cannot be directly observed from market prices, and instead a model needs to be employed for their calculation. The term structure model of inflation swaps can be used in an effort to estimate the size of premia in swap prices. By deducting the size of a premium from the market price of a swap, we can obtain the 'actual' inflation expectation shown by the inflation swap price – thus, no longer the inflation expectation under risk-neutrality. Given that the size of a premium is dependent on the model used for its estimation, the results across different models differ and the differences may be even considerable. Therefore, a high degree of uncertainty is related to such estimates. In Chart 5 we analyse the results obtained by the model used here in respect of monthly observations for 5-year forward inflation 5 years ahead.

Chart 5.

The inflation expectation under risk-neutrality in Chart 5 is the same as the 5-year inflation expectation 5 years ahead derived directly from market prices. By contrast, expected inflation in the same chart illustrates corresponding actual inflation expectation on the markets, after deduction from market prices of the premium calculated using the model. The difference between the curves in the chart thus depicts the size of the premium.

The analysis shows that expectations calculated directly from swap prices prior to 2013 – i.e. under risk-neutrality – pointed to the markets anticipating long-term inflation of around 2.3%. With the impact of a premium (on average, about 0.4 of a percentage point) taken into account, market inflation expectations were well aligned with the ECB's inflation target of holding inflation below, but close to, 2% over the medium term. A positive premium indicates that the markets require compensation for their readiness to bear the risk of high inflation. This was seen in the swap price being higher than expected inflation. Consequently, high inflation swap prices at that time did not mean that market expectations deviated from the ECB's inflation target.

Expectations derived from inflation swap prices fell significantly during the course of 2013. This is in part accounted for by weakening inflation expectations, but is largely explained by smaller premia. The premium appears, in fact, to enter negative territory at the beginning of 2016, when market participants can be considered as paying for bearing the risk of high inflation. One interpretation for this pricing is that the markets expected inflation to remain muted for an extended period of time and inflation swaps were perceived as providing good insurance against risks of low inflation.

The recent elevation of inflation expectations is, in turn, accounted for by a change in both factors: the 'actual' market inflation expectation has strengthened and the premium has grown. The bulk of the rise in risk-neutral expectations appears to be explained by the removal of negative premia, but inflation expected by the markets has also begun to accelerate. However, higher inflation expectations shown by market prices cannot be entirely interpreted as a strengthening of market inflation expectations.

If expectations derived directly from swap prices cannot be interpreted as market inflation expectations, should their use be abandoned altogether? There is no reason to do so.

Firstly, changes in risk-neutral expectations – i.e. derived directly from market prices – incorporate information on both the probability of an event and its riskiness. For example, if premia on inflation swaps decline, the markets can be assumed to be ready to pay even more for protection against negative inflation risks. This provides additional information for monetary policy decision-making, as it can be seen that the negative implications of protracted low inflation have increased.

Secondly, estimates of the size of premia depend on the choice of the model used and are generally very sensitive to different model assumptions. Considering the challenge of making an accurate estimate of premium size, no far-reaching conclusions based on models should be made about market inflation expectations. For this reason, risk-neutral inflation expectations still provide a reliable basis for analysing market inflation expectations. In this connection, however, we should bear in mind that the pricing of inflation swaps is also affected by factors other than the inflation expected on the markets.

Expectations have risen by less than a straightforward analysis indicates

Market inflation expectations have strengthened significantly since autumn 2016. Even so, higher market inflation expectations need to be interpreted with caution, as the interpretation of information embedded in different securities is not always straightforward.

One way of adding certainty to interpretations is to use models as an aid for analysing changes. The above results showed that in many cases an analysis directly based on forward inflation is sufficient, but estimation with the help of a term structure model adds a broader dimension to the analysis. Overall, it can be noted that inflation expectations have increased on the markets since last autumn, albeit by less than a straightforward scrutiny of prices would indicate.

Tags

- inflation
- inflation expectations
- inflation swap
- premium

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