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EDITORIAL

Monetary policy remains accommodative, net asset purchases about to end

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • EDITORIAL

Monetary policy has remained decidedly accommodative in the euro area, all throughout the different phases of the global financial crisis, sovereign debt crisis and the once-looming threat of deflation. To begin with, key interest rates were lowered rapidly. Secondly, the Outright Monetary Transactions (OMT) scheme was implemented to spare the monetary union the risk of break-up, which proved to be highly effective in raising confidence despite the total absence of asset purchases. Thirdly, the public sector purchase programme (PSPP) was initiated.



Monetary policy has played an important role in supporting economic growth. Without it, the output potential of many euro area countries would have deteriorated considerably more than actually occurred during the crises. The chosen policy path has also given rise to economic conditions which are conducive to structural reforms. Yet monetary policy is in itself powerless to implement reforms in labour markets, taxation or competitiveness; the responsibility and jurisdiction for these lie with other authorities.

Together, subdued inflation expectations and weakness in wage growth and price formation maintained a cycle where a sustained fall in the prices of goods and services, i.e. deflation, seemed possible. The asset purchase programme, which began in March 2015, has proved to be an indispensable tool for achieving the price stability objective in the euro area. Its effects have gained further strength from the low interest rate

environment and the policy of forward guidance. The effects of monetary policy can also be felt throughout the entire yield curve, where market rates have lowered across the entire maturity range, spanning from the deposit facility to over 10-year rates.

At its monetary policy meeting on 14 June, the Governing Council of the ECB undertook a careful review of the progress towards a sustained adjustment in the path of inflation consistent with its policy objective. The price stability objective is defined as maintaining inflation rates below, but close to, 2% over the medium term. The Governing Council anticipates that, after September 2018, subject to forthcoming data confirming the Governing Council's medium-term inflation outlook, the monthly pace of the net asset purchases will be reduced to EUR 15 billion until the end of December 2018 and that net purchases will then end.

The Governing Council noted that an ample degree of monetary accommodation will still remain, as the Council intends to maintain its policy of reinvesting the principal payments from maturing securities purchased under the APP for an extended period of time after the conclusion of net asset purchases. Furthermore, the Governing Council expects the key ECB interest rates to remain at their present levels at least through the summer of 2019 and in any case for as long as necessary to ensure that the evolution of inflation remains aligned with the current expectations of a sustained adjustment path.

Finland's economic recovery began in the course of 2015, after a period of weak developments lasting several years. Growth has become more broadly based over the past two years, as exports and private investment have increased. Consequently, the economy's recovery now rests on a more solid foundation.

Finland's public finances have gathered strength. The general government deficit has shrunk and the ratio of public debt to GDP has begun to contract. This has been due to both general government consolidation measures and the increasingly robust economic conditions.

However, determined efforts are still required to address the challenges to fiscal sustainability in the long term; public sector revenues are expected to fall short of expenditures in the forthcoming decades, assuming no new decisions on measures that would bolster the public finances.

For one, the effects of population ageing have already led to a decline in the number of working-age persons but a rise in pension expenditures. Beginning from early next decade, population ageing is also expected to raise public healthcare costs and demand for care services, as they will be increasingly needed by Finland's Baby Boomers.

Servicing public debt would be less problematic if the economy's long-term outlook mirrored that of past decades. Yet, according to the Bank of Finland's latest long-term projections, economic growth will remain slower in Finland than it was before the global financial crisis.

Fiscal policy is estimated to have eased this year, and it will remain largely neutral in 2019, barring significant policy decisions. In an environment where economic conditions have significantly improved but where the long-term sustainability of public finances

remains ambiguous, it would appear prudent to strengthen the general government balance at a pace faster than forecast.

The current balance and future outlook of general government finances, structural reforms that might strengthen them, and domestic cost developments are all issues that are directly related to the Bank of Finland's mission. Hence, the Bank has commented on these topics on a consistent basis. The Bank has additionally conducted analyses on issues related to its objectives but which may also involve value considerations. These include inclusive economic growth, social security, housing policy and the impact of regulations restricting competition.

All such statements and analyses are grounded in research data, international experience and the Bank of Finland's own independent analysis, wherein the economic forecast plays an important role. By virtue of research data, we can strive to create a balanced view on the nature and effects of different kinds of policy decisions. In the future, economic research can be expected to lend strength to and illuminate our national debate on economic policy even further as the new Helsinki Graduate School of Economics is launched. Nevertheless, many of the issues that central banks seek to address are not restricted to the domain of economics; solving them will require research contributions, expertise and collaboration across a variety of disciplines.

Helsinki, 18 June 2018

Erkki Liikanen
Governor of the Bank of Finland

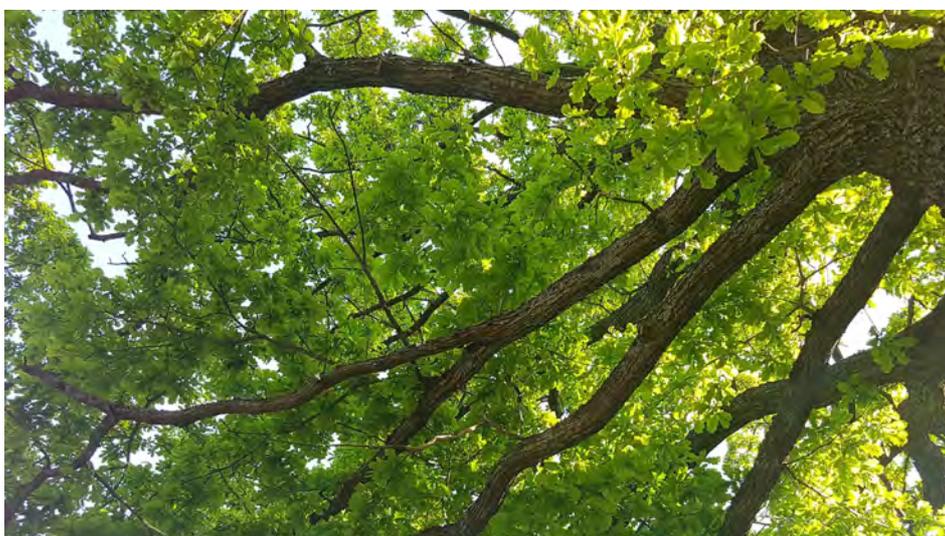
Tags

[economic development](#), [economic situation](#), [Finnish economy](#), [monetary policy](#), [public debt](#), [public finances](#)

Finland's economy booming

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK

Finland's economic growth will continue and remain broadly based. Strong global demand, improved cost-competitiveness, growth in household income and favourable financing conditions will all support growth over the forecast period. GDP growth forecasts for 2018–2020 stand at 2.9%, 2.2% and 1.7%. The declining growth rate in the immediate years ahead reflects the moderate long-term outlook for growth. Inflation will remain close to 1% over the years 2018–2019 before gathering pace and reaching 1.5% in 2020.



Rapid economic growth and an improved employment situation will raise households' real purchasing power at an annualised rate of approximately 2%. However, the rise in purchasing power will be somewhat mitigated by higher inflation towards the end of the forecast period. Private consumption continues to exceed disposable household income, and thus the households will continue to gather more debt. Growth in household consumption will slow from 2.3% to 1.6% by 2020.

Private investment developed strongly in the beginning of the year, as housing construction and capital investment continued at a brisk pace. The recent pick-up in investment activity can be attributed to the favourable growth outlook and strong profitability and earnings growth within the corporate sector. Investment growth will peak at approximately 4% in 2018, before decelerating to 2.5% during the forecast period. This rate may remain higher, however, if planned investments in manufacturing are widely implemented.

Finland's export growth accelerated to 7.8% in 2017. Exports are being bolstered by domestic business investments already implemented in recent years. Accommodative monetary policy has sustained investment growth within the euro area and strengthened demand for Finnish exports. Export growth will decline slightly following last year's spurt but is expected to remain robust, at approximately 4%, backed by external factors. Finland's export markets will continue to expand, following the booming global economy and adding strength to Finland's investment-led export structure.

In 2017, the current account posted a slight surplus for the first time in many years and will continue to do so, at approximately 1% of GDP over the years 2018–2020. The value of exports exceeded the value of imports.

The number of employed persons increased rapidly in late 2017, and employment growth will remain strong throughout the current year. The employment rate will reach just under 72% by 2020; however, a declining working-age population, labour market mismatch problems, and a high degree of structural unemployment will all weigh on employment growth during the forecast period. Productivity growth has accelerated, however, and will bolster economic growth.

Inflationary pressures will remain subdued as unit labour costs have grown moderately and Finland's trade-weighted exchange rate has appreciated. Consumer price growth will be sustained by rising energy and food prices as well as services price inflation. Inflation according to the harmonised index of consumer prices (HICP inflation) will be 0.9%, 1.0% and 1.5% over the years 2018–2020.

The fiscal position of general government clearly improved in 2017 owing to moderate spending growth and increased tax revenue. Nevertheless, fiscal policy will be eased especially in 2018, amid strong economic growth. Consolidated general government debt will shrink below 60% of debt-to-GDP in 2019, on the back of favourable cyclical conditions. Hence, in 2019 Finland will satisfy the EU's Stability and Growth Pact criteria, according to which the annual budget deficit should be no greater than 3% of GDP and outstanding debt-to-GDP no larger than 60%.

GDP: Improvement of productivity supports growth

The Finnish economy has been growing for three consecutive years. In 2018, Finland will move from an upswing to a boom, with economic resources in more intensive use than is normally the case. Output is growing faster than its potential, and the output gap has closed (see "[The output gap has closed; Finland's economy at cyclical peak](#)").

Output has grown in recent years mainly due to the favourable development of labour productivity. Employment has grown at a slower rate than productivity, except for a period of rapid growth in the second half of 2017. In 2018, GDP will finally reach its level of 2008, immediately preceding the financial crisis.

Rapid capital investment growth has increased the capital stock and boosted labour productivity, thus strengthening the economic conditions for growth in the coming years. Growth potential over the coming years will be largely dependent on productivity growth. Employment will also increase in the forecast period, but more slowly than productivity.

Population ageing and problems with labour supply will slow employment growth. At the same time, the labour supply issues and high capacity utilisation within industry will limit output growth.

According to the Bank of Finland forecast, GDP growth will accelerate to 2.9% in 2018. Both domestic demand and exports will boost overall demand. Net exports will support economic growth throughout the forecast period, as lower domestic demand will slow import growth.

In the immediate years ahead, growth will continue to be broadly based, but slowing towards the end of the forecast period. In 2019, growth will reach 2.2% and will then slow to 1.7% in 2020.

Table 1.

Forecast summary

Percentage change on the
previous year

| | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--------------------------|------|-------------------|-------------------|-------------------|
| GDP | 2.6 | 2.9 | 2.2 | 1.7 |
| Private consumption | 1.6 | 2.3 | 1.9 | 1.6 |
| Public consumption | 1.3 | 0.6 | 0.1 | 0.7 |
| Fixed investment | 6.3 | 3.9 | 2.9 | 2.1 |
| Private fixed investment | 8.4 | 4.2 | 3.3 | 2.5 |
| Public fixed investment | -2.9 | 2.2 | 0.5 | 0.4 |
| Exports | 7.8 | 5.1 | 3.9 | 3.1 |
| Imports | 3.5 | 3.1 | 2.8 | 2.6 |

Effect of demand components on growth

| | | | | |
|---|------|------|-----|-----|
| Domestic demand | 2.6 | 2.2 | 1.7 | 1.5 |
| Net exports | 1.5 | 0.8 | 0.5 | 0.2 |
| Changes in inventories and statistical error | -1.4 | -0.1 | 0.0 | 0.0 |

| | | | | |
|------------------------------------|------|------|------|------|
| Savings rate, households, % | -1.5 | -1.9 | -1.8 | -1.9 |
|------------------------------------|------|------|------|------|

| | | | | |
|----------------------------------|-----|-----|-----|-----|
| Current account, % of GDP | 0.7 | 0.9 | 0.7 | 0.9 |
|----------------------------------|-----|-----|-----|-----|

Labour market

| | | | | |
|------------------------|-----|-----|-----|-----|
| Number of hours worked | 0.7 | 1.3 | 0.7 | 0.4 |
| Number of employed | 1.1 | 1.4 | 0.8 | 0.4 |

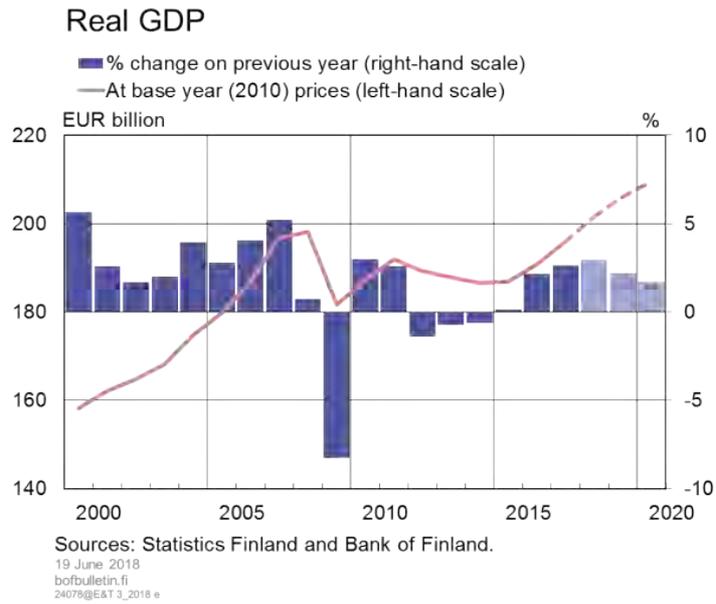
Forecast summary

| | | | | |
|--|------|------|-----|------|
| Unemployment rate, % | 8.6 | 8.0 | 7.7 | 7.5 |
| Unit labour costs | -2.7 | -0.6 | 0.6 | 1.9 |
| Labour compensation per employee | -1.2 | 1.0 | 2.0 | 3.2 |
| Productivity | 1.5 | 1.6 | 1.4 | 1.3 |
| GDP, price index | 0.9 | 1.1 | 1.6 | 2.0 |
| Private consumption, price index | 0.9 | 1.0 | 1.3 | 1.7 |
| Harmonised index of consumer prices | 0.8 | 0.9 | 1.0 | 1.5 |
| Excl. energy | 0.5 | 0.8 | 0.9 | 1.7 |
| Energy | 5.7 | 3.0 | 2.4 | -0.6 |

f = forecast

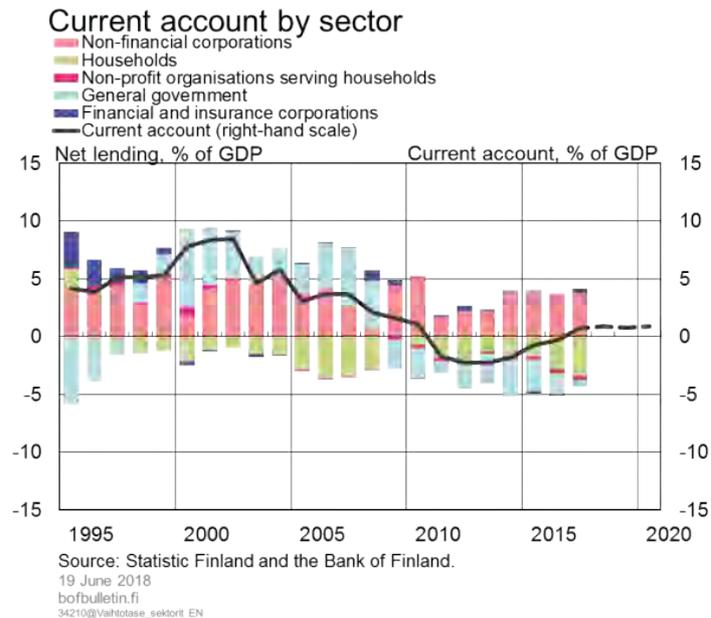
Sources: Statistics Finland and Bank of Finland.

Chart 1.



Higher net exports during the forecast period will further improve the current account, and the persistent current account deficit is melting away. The current account surplus is largely a consequence of improvement in the public finances, reducing government borrowing from abroad. Furthermore, the current account has been strengthened by export income and the increase in profits and capital gains received by non-financial corporations on their foreign investments. Meanwhile, the household borrowing will continue to increase.

Chart 2.



The forecast is based on Statistics Finland's Quarterly National Accounts (last quarter of 2017) published on 16 March 2018, and other available information. The Quarterly

National Accounts published by Statistics Finland on 31 May 2018 are discussed in "First quarter of 2018 sees a surge in investments".

Households: growth in purchasing power supports consumption

The boom will strengthen households' purchasing power on the back of both earnings and employment growth. Private consumption will still grow at a rate of around 2% in 2018, falling below 1½% towards the end of the forecast horizon. Yet, private consumption will exceed disposable household income throughout the forecast period, and households will continue to accumulate further debt.

The negotiated wage increases agreed upon in the course of the winter and spring were reflected in higher earnings growth compared with previous years. Another factor behind the growth in earnings is the notably higher wage drift compared with previous years. Overall, earnings growth will average around 2½% per annum in the forecast years, but real earnings growth will be subdued by the pick-up in inflation towards the end of the forecast period.

In the current year, the rise in households' purchasing power will be driven more by strong employment growth than by pay rises. In 2018, the number of employed will increase by around 1½% on 2017. In 2019 and 2020, economic growth will fade, with the annual rate of employment growth falling to ½%.

The tax amendments announced will not have a major impact on households' aggregate disposable income. The easing of taxes in 2018 will be almost outweighed by the simultaneous increase in social security contributions.

Growth in households' purchasing power will peak in 2018, when real disposable income will increase by roughly 2%, falling back below a 1½% per annum increase in 2019 and 2020.

As well as growth in purchasing power, private consumption will also be sustained by consumers' strong confidence in both their own finances and in the Finnish economy. According to Statistics Finland's 'Consumer Survey', consumer confidence in the continuation of positive growth is above all sustained by the favourable employment situation.

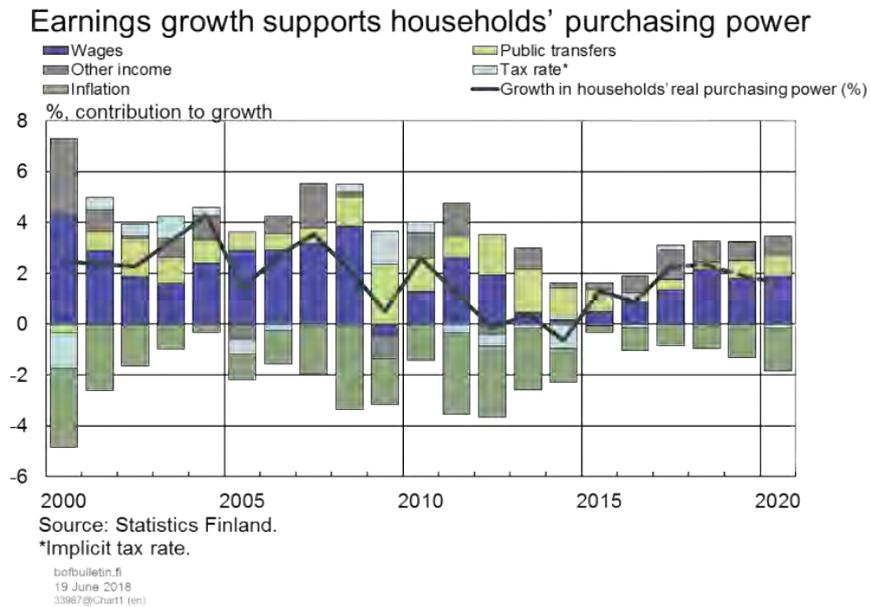
Private consumption will continue to underpin economic growth, but the pace of growth in consumption will slowly abate. While private consumption will still grow at an annual rate of close to 2% in 2018, this will slow to 1.2% in 2020.

The share of households' consumer spending accounted for by services has been increasing during the last years. However, in the current cyclical upswing, semi-durables, such as clothing, have recorded the most rapid increase, up by around 5% in 2017 from the year before.

Although growth in purchasing power is currently much faster than in the recession years, the household savings rate will remain negative, with household indebtedness

deepening further. Given that the public sector continued to be in deficit last year, the national economy has been reliant on the corporate sector for savings (Chart 3).

Chart 3.



In the last quarter of 2017, the ratio of household debt to disposable income was just over 128%, and households will continue to accumulate further debt in the forecast years. The favourable economic cycle, together with low real interest rates, will bolster demand for new housing loans, especially in the Greater Helsinki area and other growth centres where housing sales are brisk. The household loan stock will expand faster than disposable income, with the growth rate expected to pick up slightly in the forecast years (Chart 4). In the early part of the year, households' housing loan stock increased at an annual rate of roughly 2%, against 6–7% at the turn of the previous decade. The stock of consumer credit has posted steady growth of 3–4% per annum in recent years and is expected to continue to expand in the future.

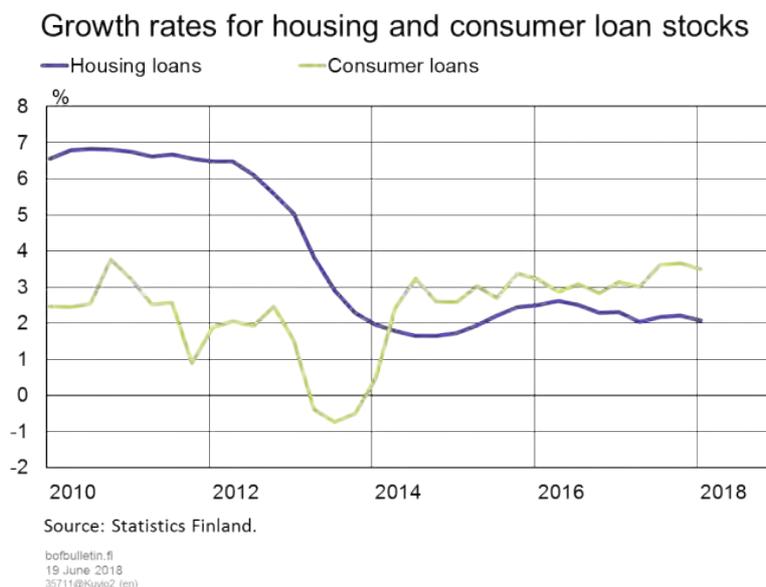
The growth rate of the housing loan stock underestimates the rate of debt accumulation for mortgage-holding households, as it does not include the household debt held by housing corporations. According to an estimate by Statistics Finland, households held housing company loans worth around EUR 18 billion at the end of 2017.^[1]

Nationwide, growth in the housing loan stock is reined in by regional differences within the housing market. While in growth centres households are ready to take on increasingly large loans to facilitate their entry to the housing market, sales of old flats outside the growth centres have been sluggish. However, in response to the steep increase in the prices of flats and the large share of housing sales accounted for by new-build construction, the number of heavily indebted households has increased in growth

1. This may be a slight overestimation of households' share of housing company debt, as the share of new flats purchased by housing investors may be higher than estimated.

centres, where first time buyers must take on increasing amounts of debt to be able to enter the housing market.

Chart 4.



Non-financial corporations: investment spurs growth

Private investment has spurred growth, with both residential construction and fixed investment remaining brisk. The positive trend in investment reflects a favourable growth outlook, good corporate profitability and higher profits, supported by an accommodative monetary policy and the Competitiveness Pact. In the forecast period, investment growth will peak in 2018, climbing to 4.2%. Growth in private fixed investment will moderate over the forecast horizon in response to fixed investment dwindling and investment concentrating towards construction. Investments are surrounded by an upside risk, provided that the planned industrial investments are realised on a broad scale.

In 2017, total investment was up by 6.3%, and private investment by 8.4%. This strong upswing was sustained in the early part of 2018, despite the completion of certain large investment projects in 2017. Investment in machinery, equipment and transport equipment, in particular, expanded considerably. Fixed investment currently serves to enhance the output potential of the economy, making up for the depreciation of productive capital witnessed in the recession years.

Chart 5.

Residential construction and fixed investment remain brisk



The rebound in investment has pushed up the investment rate – gross fixed capital formation relative to GDP – to around 23% (and the private sector investment rate to 19%). The current very strong growth in investment will gradually ease off with a moderation in construction growth. Private fixed investment will increase 4.2% in 2018, with the pace of growth moderating to 3.2% and 2.4%, respectively, in 2019 and 2020.

Construction activity remained buoyant in the early part of 2018, and notably the pace of residential construction was brisk. However, growth in construction investment is levelling off and will decline towards the end of the forecast horizon. Residential construction will remain brisk in 2018 and, judging from the increase in construction permits, large numbers of new flats will be completed this year. Renovation work will also continue to grow, with commercial construction driving growth in construction as a whole. By contrast, other construction activity will slow. Industrial construction has shown a downtrend for several years already, while commercial construction has been sustained by warehouse construction. Civil engineering construction will also fade, despite the major infrastructure projects underway in the forecast period. The capacity utilisation rate is high in the growth centres, with building production constrained by a shortage of skilled labour.

Corporate confidence remained strong in the early part of 2018, and cyclical conditions across all main sectors of industry are assessed to be better than average. In manufacturing, output and new orders increased in the early part of the year, output expectations are high and the order stock is expected to remain robust. The capacity utilisation rate has almost returned to pre-crisis levels. Confidence also continues to be strong in the services and retail sectors. The conditions for business activity and entrepreneurship have also improved across every region of Finland relative to 2017.

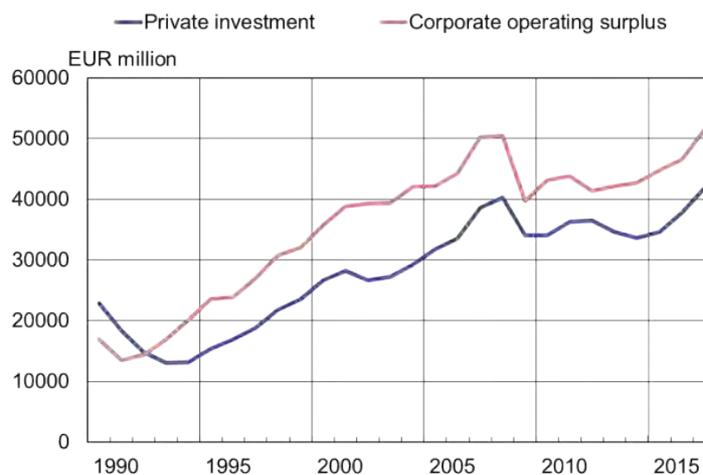
Financing conditions for non-financial corporations will remain favourable, with good access to funding supporting growth in investment. The accommodative stance of

monetary policy will keep lending rates down. The average rate of interest on the corporate loan stock was 1.4% in the early part of 2018, i.e. around 0.7 percentage points below the euro area average, and loan margins have remained stable for the past year. The corporate loan stock expanded in 2017 and 2018, although the growth rate for new corporate loan drawdowns has slowed for several consecutive months. Small and medium-sized enterprises (SMEs), who have faced funding bottlenecks, have also slightly increased their use of external funding sources. Having been negative for three consecutive years, net issues of Finnish corporate bonds turned positive in the amount of EUR 1.8 billion in 2017. Overall, access to funding does not appear to be impairing growth for non-financial corporations; rather, there are some bottlenecks due to the shortage of suitable labour.

Corporate sector profits have grown (see also the article ‘[Are weekly performing firms suppressing economic growth?](#)’). In the National Accounts, operating surplus equals operating profits in the financial statements of non-financial corporations. In 2017, the operating surplus from ordinary activities rose by as much as 17.5%, against 5% on average in 2013–2016. However, aggregate entrepreneurial income for non-financial corporations (which roughly corresponds to profits before taxes and dividend payments) was up by only 10%, due to a decline in the capital income counting towards entrepreneurial income.

Chart 6.

Corporate profits and investments have grown



Source: Statistics Finland.

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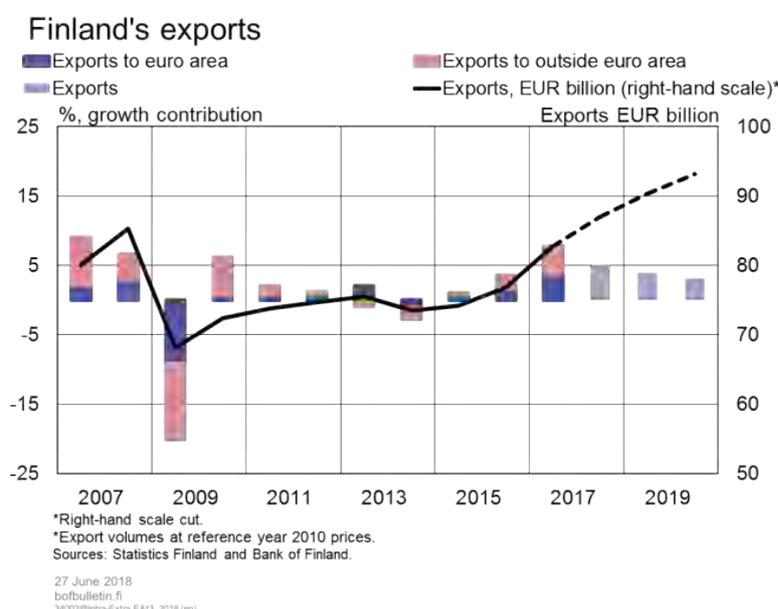
The corporate sector's financial position showed a surplus of EUR 8.4 billion in 2017, and the status as net lender enjoyed by the corporate sector throughout the 2000s continued to strengthen. In the years 2018–2020, corporate sector profitability will remain strong on the back of output growth and rapid productivity growth. This creates scope for corporate investment and growth, and further improvements in employment.

Foreign trade: exports boosted by strength of global economy

Finland's export growth accelerated markedly last year. Exports will remain on a firm growth path, supported by external factors, but the pace of growth will abate somewhat after the spurt seen last year.

In 2017, Finnish exports increased by 8% (Chart 7), growing faster than the export markets, meaning Finland actually gained market share. Both goods and services exports increased at a rapid pace. Growth has been broadly based both geographically and by commodity structure. The brisk growth in exports notwithstanding, export volumes were still 3% below 2008 levels, although the export markets have expanded by 25% over the same period.

Chart 7.



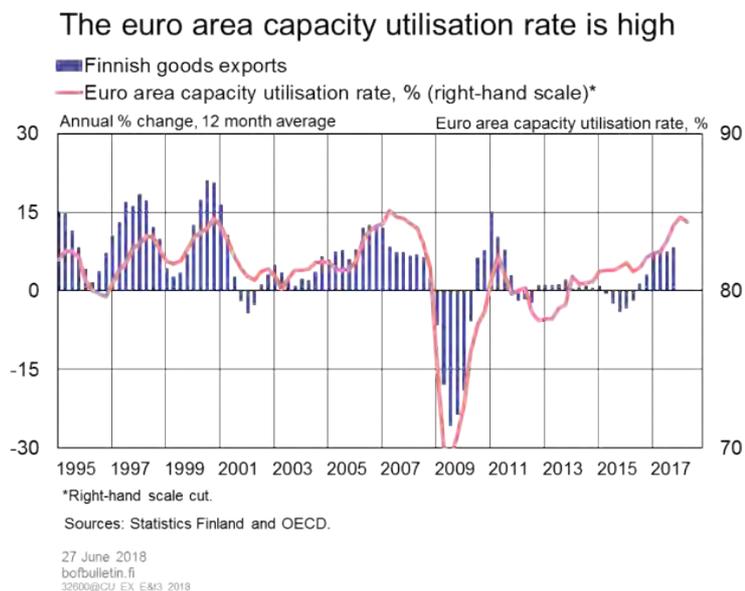
In the forecast period, exports will remain on a strong growth path, posting faster growth than the average since the turn of the millennium. The conditions for export growth are in place, and the favourable export outlook is underpinned by several factors. During the forecast period export volumes will finally rise above the levels of 2008.

Finnish exports will be substantially bolstered by external factors, with the export markets driven by the strong global cycle. The prolonged expansion of export markets is conducive to Finland's investment-driven export structure. The fixed investment undertaken domestically in the past few years will also broaden export opportunities. Moderate wage increases and productivity gains have also contributed to the improvement in the cost-competitiveness of exports. By contrast, the appreciation of the exchange rate will somewhat rein in growth in exports to countries outside the euro area.

Accommodative monetary policy has sustained a rebound in investment, thereby supporting Finnish exports. The capacity utilisation rate in the euro area is very high,

and growth in investment is expected to continue. The euro area is Finland's key export market, and cyclical fluctuations in the area are quickly reflected in export developments (Chart 8). Weaker-than-expected performance in the euro area economy would entail slower-than-expected export growth for Finland.

Chart 8.

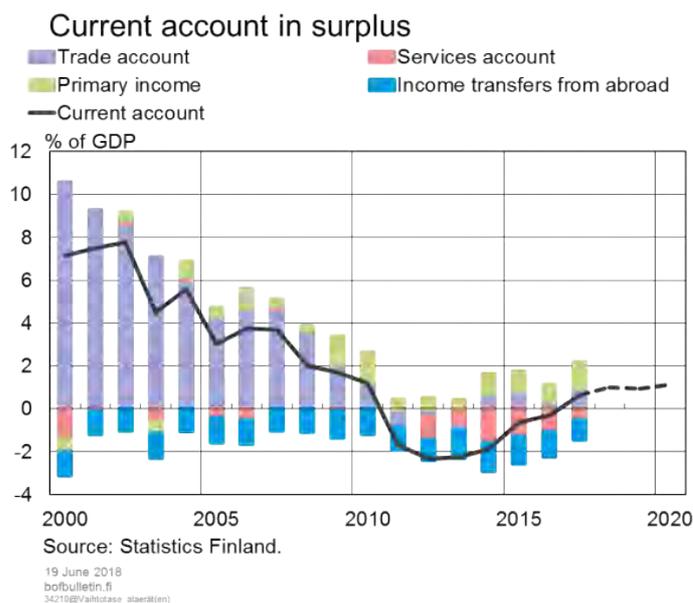


In 2017, the current account was slightly in surplus for the first time in many years (Chart 9). During the past six years, Finland had run up a large current account deficit of more than EUR 18 billion.

The current account surplus of around EUR 1½ billion (0.6% of GDP) in 2017 was generated by the surplus in export of goods, and by factor income. Both the services account and the international transfers account posted a deficit (Chart 9).

The current account will remain slightly in surplus also in 2018–2020. Strengthened by exports, the surplus will stand at 1% of GDP. The terms of trade will not improve, as the increase in export prices will be contained by domestic cost developments. An improvement in the terms of trade is also held back by Finland’s economic recovery lagging behind the global upswing.

Chart 9.



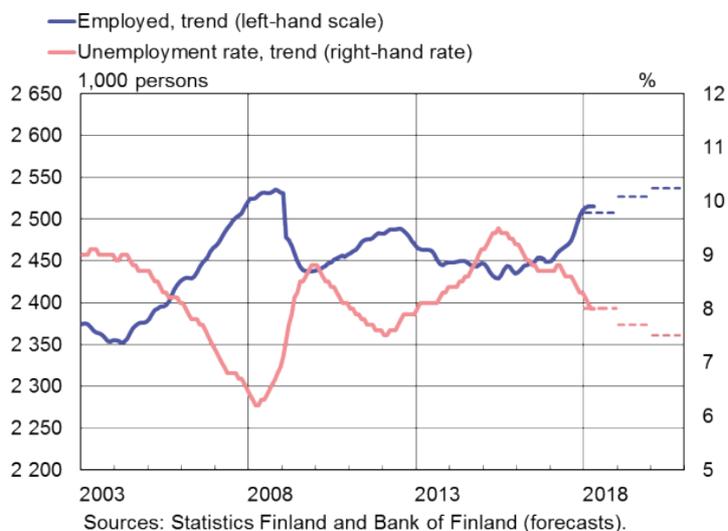
Labour market: Limits of employment growth approaching

Employment grew substantially at the turn of the year 2017–2018, but the rate of growth has already begun to slow. The number of employed will increase in 2018 by about 1.5% and the employment rate will rise. However, employment growth will continue to moderate during the forecast period as the working-age population continues to shrink, with problems of labour supply and demand mismatch persisting and economic growth slowing. Overall, the number of people employed will increase in the forecast years by more than 60,000 and the employment rate will rise to around 72%. The unemployment rate will fall, but the high level of structural unemployment will hinder the reduction of unemployment in the forecast years. However, as the economy continues to grow, the unemployment rate will fall to 7.5% by 2020.

The number of employed and the employment rate have been rising during the past six months much more than foreseen in the previous Bank of Finland forecast in December 2017. The strongest surge in employment growth occurred around the turn of the current year, but since then the momentum has faded somewhat (Chart 10). The rate of growth in employment in the forecast years 2018–2020 will fall well below that of recent.

Chart 10.

Employment has improved rapidly



A more detailed analysis of the rapid employment growth at the turn of the year is indicative of the possibilities for further employment growth. An analysis by age group shows that the employment rate of 55–64-year-olds in particular has improved, as to a lesser extent has that of 40–54-year-olds. The employment rate of over-55s is markedly higher than before the financial crisis, while that of the 40–54-year-olds has almost recovered to the pre-crisis level.

However, the employment of young adults (25–39-year-olds), which has developed less favourably than the other age groups in the post-financial crisis period, has still not improved a great deal. The employment rate of young adults is still almost 6 percentage points below that of 2008. In order for employment to continue to improve, the employment rate of this age group would also need to return more quickly to the 2008 figures, especially as the trend of older workers' improving employment rate cannot continue indefinitely. However, there is a risk that young adults who lost their jobs during the recession or have never found work since graduation will be marginalised from the labour market for a prolonged period or even permanently.

An analysis of employment rate developments by sector indicates that the growth in the employment rate has taken place across a broad spectrum. At the end of 2017, however, there were many vacancies within social welfare and health care services, public administration and education. Industrial employment also improved in the early part of 2018, having declined continuously since the financial crisis until 2015 and remaining somewhat unchanged thereafter. Employment growth was also influenced by the fact that employment within trade and hotel and restaurant services was no longer declining at the turn of the year. Employment in other private services sectors began to grow already in 2017, while employment in construction has already been developing positively for a number of years. During the forecast years, economic growth will be driven more than in recent years by industrial sectors with a low labour intensity, while

construction activity, which is very labour-intensive, will slow. Service sectors will continue to grow, but labour shortages will undermine the employment effect.

Employment has been growing during the past 12 months across all types of employment, which indicates primarily that the upswing is strong and demand for labour is high. However, employment has increased most in fixed-term part-time work, and this has contributed to the spike in the employment rate figures at the turn of the year. The fact that there are more fixed-term part-time jobs may also be the result of the labour-market activation model introduced at the beginning of 2018. This requires unemployed persons to undertake at least 18 hours of paid work during a 65-day monitoring period in order to avoid having their unemployment benefit reduced. The rapid increase in fixed-term part-time work is likely to be temporary, and this will contribute to a slower increase in employment going forward.

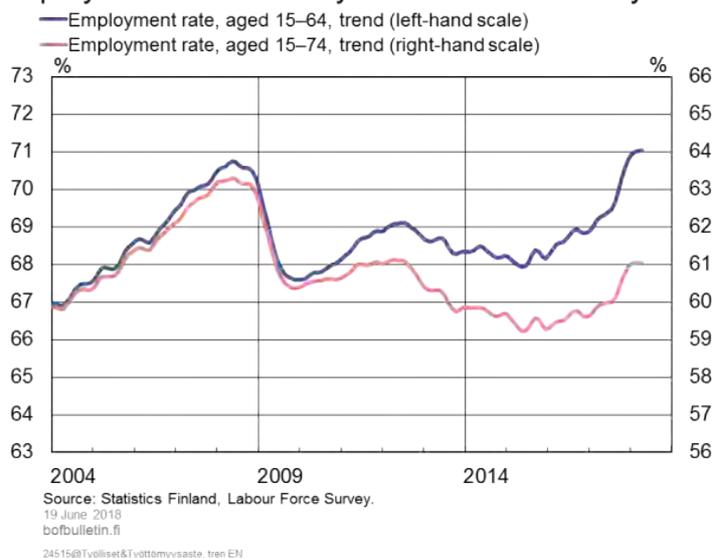
There are growing signs on the labour market that the limits to growth are approaching. [Unemployment is already close to its structural level](#), companies are more widely reporting recruitment difficulties, and it is taking a longer time to fill vacancies. There are fewer and fewer unemployed jobseekers per vacancy. The Beveridge curve, which shows the relationship between unfilled vacancies and unemployment, also indicates that there are problems of matching supply and demand, and the proportion of long-term unemployed remains high.

Between 2019 and 2020, employment will increase by an average of 0.5%. However, throughout the forecast period, the number of people employed will increase by more than 60,000, due to the strong employment growth in 2018. The unemployment rate will fall as economic growth continues, although its decline is slowed by high structural unemployment. By 2020, the unemployment rate will fall to 7.5%. Only part of the increase in employment is due to a reduction in unemployment, and the labour-market participation rate is expected to continue to rise.

The employment rate will rise to about 72% in 2020, i.e. much higher than before the financial crisis. The official employment rate is calculated for the population aged 15–64, not taking into account that the share of the over 65-year-old population is increasing. If the employment rate were to be calculated for the population aged 15–74, the trend would be considerably weaker than the official employment rate (Chart 11), because the employment rate for those aged over 65 years is well below the average. Therefore, the total number of people employed (aged 15–74), which is a key indicator in terms of the funding of the welfare state, will not increase at the same rate as the official employment rate. As the population ages, attention should also be paid to indicators that take into account those aged over 65.

Chart 11.

Employment rate 15–64-year-olds and 15–74-year-olds

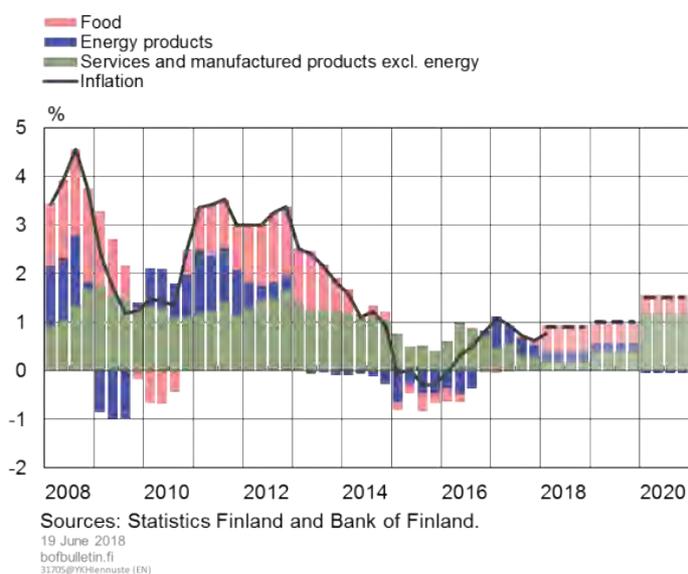


Wages and prices: Inflation slower than in the euro area

Inflation will remain subdued over the years 2018–2020, but will gather pace towards the end of the forecast period, backed by the booming economy. Inflation according to the harmonised index of consumer prices will reach 0.9% in 2018, before gradually accelerating to 1.5% in 2020 (Chart 12). Consumer price inflation in Finland will remain slower than in the euro area, reflecting moderate domestic cost development. Services prices will play a slightly diminished role in supporting inflation, but the contributions of the energy- and food price components will both increase. The impact of reduced growth in administered prices as well as hikes in indirect taxation will clearly feature in 2018's inflation rate.

Chart 12.

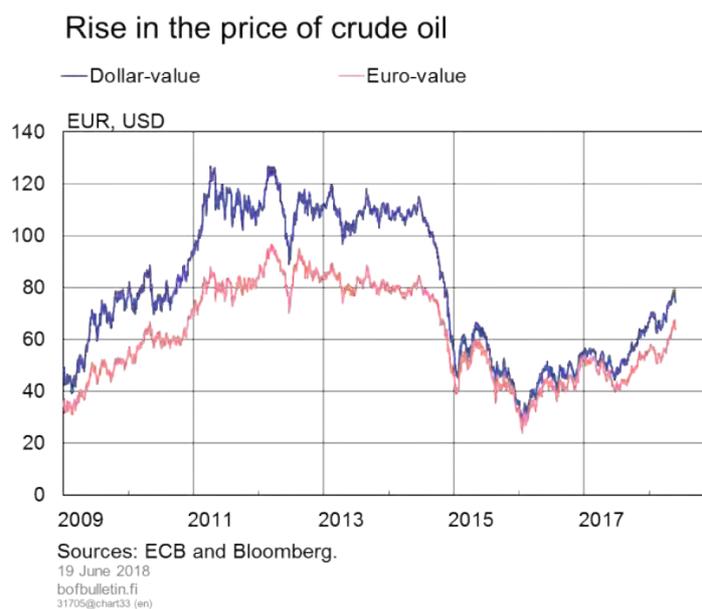
Inflation remains moderate



Growth in the prices of services has decelerated in recent years and will remain markedly slow in the beginning of the forecast period. This development can largely be attributed to an observed moderation in the inflation of rents and housing services as well as a decline in the prices of transportation services. Furthermore, moderate wage growth in recent years has in part curtailed inflation in services prices. The reduction in daycare fees will also slow the inflation rate in 2018.

The prices of energy products will begin to increase following a period of stagnation, buoyed by a rising oil price. The price of crude oil per barrel has reached over EUR 60, increasing by almost half since summer 2017 (Chart 13). According to market expectations, however, the oil price is assumed to slightly fall during the forecast period. The higher oil price's impact on domestic consumer prices will be most evident in rising fuel prices. The decline in the prices of other manufactured goods will continue during the forecast period. The growth rate of goods prices has especially been driven by lower prices in electronics, clothes, vehicles and housing-related goods.

Chart 13.

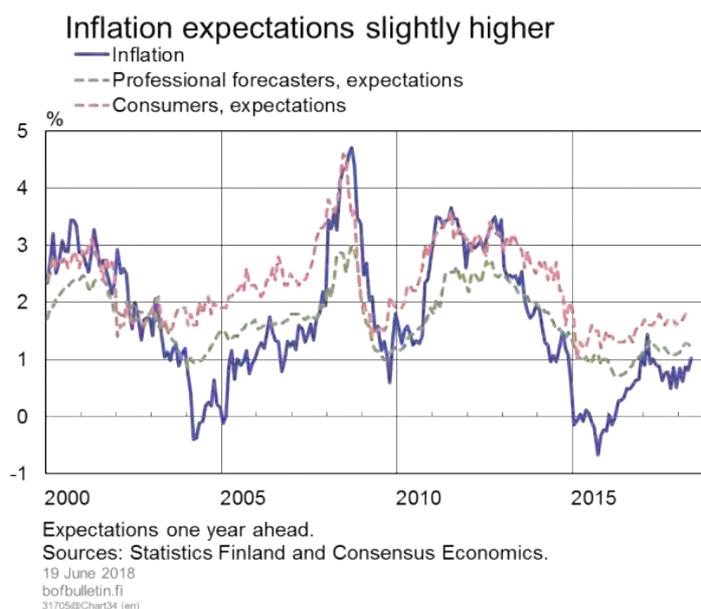


Growth returned to food prices in 2017 following a two-year decline and accelerated in early 2018, especially due to higher excise duties on alcohol. In addition, increases in commodity prices, including energy, will sustain food price inflation throughout the forecast period.

Domestic inflation expectations have slightly recovered in the wake of recent inflation figures. Surveys aimed at both professional forecasters and consumers suggest that inflation is expected to be at a slightly higher rate in a year's time (Chart 14). In addition, expectations concerning inflation in the euro area have also improved.

Inflation will persist at a lower rate in Finland compared with the euro area; by the end of the forecast period, the difference between the respective price-levels will narrow by approximately 1 percentage point.

Chart 14.



Growth in the wage bill accelerated to 2.6% in 2017, backed by favourable employment conditions. Based on national accounts data, average hourly earnings increased at a rate of almost 2%, despite negotiated wage freezes and cuts in public sector holiday bonuses due to the Competitiveness Pact. However, average earnings growth remained far more moderate according to the index of wage and salary earnings, reaching only 0.2%. Public sector earnings contracted by 1%; in the private sector, earnings increased by almost the same nominal amount, as measured by the index.

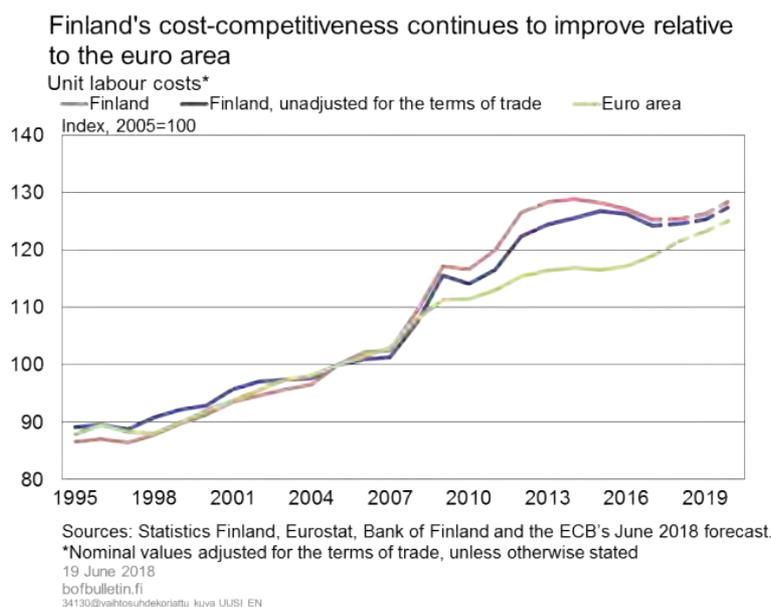
In the years 2018 and 2019, wage growth will be determined by the collective labour agreements implemented at the turn of year, and negotiated wages will accordingly rise by just over 3% over the next two years. Local items stipulated in the new labour agreements may curtail the share of others factors that contribute to wage growth, i.e. the prominence of wage drift. On the other hand, wage drift will gain upward pressures from tightening conditions in the labour market. Overall, earnings will increase at an annualised rate of approximately 2.5% in 2018 and 2019, which is consistent with productivity and price growth. In 2020, private sector real earnings will be determined by productivity growth, but public sector earnings will see a temporary boost in growth as holiday bonuses are reinstated.

In addition to average earnings growth, the wage bill of the aggregate economy rise due to gains from improvements in the employment rate. The wage bill will expand quickest in 2018. Afterwards, employment growth will begin to deaccelerate and its contribution to the wage bill will mitigate. Labour cost growth, i.e. growth in compensation per employee^[2], will remain slower than that of the wage bill in 2018 and 2019, as the accrual of employers' social security contributions will contract in 2018 and will only see marginal growth in 2019.

2. Compensation per employee includes the wage bill as well as all compulsory social security contributions paid by employers.

Unit labour costs^[3] will grow only slightly in 2018 and 2019, as output will grow at almost the same pace as labour costs. In 2020, unit labour cost growth will accelerate, as labour costs will increase on the back of earnings growth as well as higher contributions in social security payments, while at the same time productivity growth will decline. Over the forecast period, Finland's unit labour costs will grow at a slightly slower rate compared with the euro area, meaning that Finnish cost-competitiveness will improve (Chart 15). Contrary to the past trend, weakening terms of trade will have little impact on Finland's competitiveness relative to the euro area.

Chart 15.



Public finances: fiscal stance loose relative to the cyclical situation

The general government budget balance improved noticeably in 2017. Besides the cyclical situation, the budget balance was also partly supported by temporary factors, the dissipating impact of which will slightly weaken the position for 2018. The budget balance will improve again in 2019–2020, backed by economic growth and public sector savings measures. The general government debt-to-GDP ratio will contract below the 60% reference value.

Real growth in public consumption will be moderate in 2018–2020. Growth will be dampened by the Government Programme's consolidation measures and the Competitiveness Pact. Public investment will increase especially in 2018, after which the pace of growth will slow as the key government projects and the action plan to reduce the

3. Here unit labour costs are derived from national accounting data as compensation per employee relative to real GDP. They can also be derived from data on the number of wage-earners and employed persons, according to which unit labour costs will still decline in 2018. Currently, different measures of unit labour costs show considerable disparity, as a decline in the amount of entrepreneurs has increased the amount of wage-earners much faster than the employment rate.

maintenance backlog of transport infrastructure come to an end. Higher pension expenditure will push up expenditure on social benefits, while on the other hand expenditure on unemployment benefit will decline. The general government expenditure-to-GDP ratio will contract further in the forecast period.

Fiscal stance will be loose, but the requirements of the Stability and Growth Pact will be met

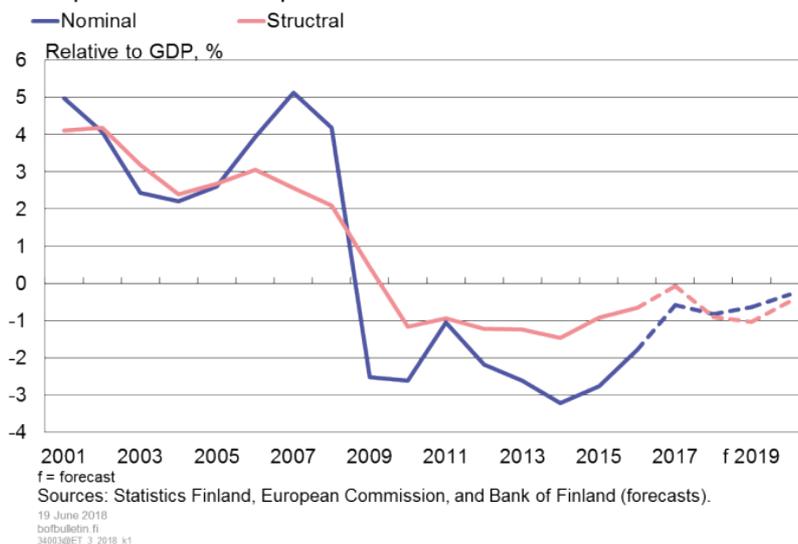
The total tax ratio will decline by about 1½ percentage points, to 42%, in 2018–2020. The decline reflects Competitiveness Pact-related tax cuts and changes in employers' and employees' social security contributions. On the other hand, the favourable cyclical situation will boost tax revenues. Income tax has been cut further during the current year, to mitigate the effects of the Competitiveness Pact. In keeping with the Pact, employers' earnings-related pension, unemployment insurance and health insurance contributions were reduced further. In addition, the financial burden for earnings-related pension and unemployment insurance contributions was further shifted from employers to employees. The public sector savings measures specified in the Government Programme will be continued in 2018–2019, including, for example, a decision not to carry out index increments to certain social benefits and allowances.

The general government structural balance, i.e. the budget balance adjusted for cyclical factors, will remain in deficit (Chart 16). The fiscal stance will be loosened especially in 2018, at a time when the economy is already growing at a robust pace. Because the tax decisions for 2019 will not be taken until autumn 2018, the forecast only takes account of the tax measures specified in the Government Programme. Hence, in 2019, the general government structural balance will remain roughly unchanged, posting a deficit of around 1%. Despite the deterioration in the structural balance in 2018–2019, Finland is likely to be in compliance with the requirements of the preventive arm of the EU's Stability and Growth Pact, due to the deviations granted to Finland earlier.

In 2020, the fiscal stance will be tightened without additional measures, and reaching the medium-term objective (MTO) for the structural balance appears plausible. The budget for 2020 will be drafted by the Government that will take office after the next general election. Therefore, the forecast for 2020 is based on a no-policy-change scenario. The effects of the regional government reform and the social and healthcare reform have not been estimated either, as the regulations are still under preparation.

Chart 16.

Structural deficit falls short of target in 2018–2019 but complies with EU requirements due to deviations



General government deficit contracts

The central government nominal deficit will remain unchanged from the previous year in 2018, after which it will contract to 0.6% of GDP by the end of the forecast horizon. The change compared with 2017 is blurred by large one-off tax revenues received by the government the same year. The improvement in central government finances during the forecast period stems largely from an increase in indirect tax revenues due to the level of economic activity, and expenditure adjustments. Total central government expenditure will not increase at all in 2019 and will grow at a much slower rate in 2020 than revenues. Central government transfers to other general government entities will remain at the previous year's level in 2018, after which they will decrease in 2019–2020.

The local government budget balance will begin to deteriorate again during the forecast period. Central government transfers to local government will decrease due, for example, to a reduction in these transfers related to the Competitiveness Pact and an adjustment of the division of costs between central government and the municipalities. On the other hand, the Competitiveness Pact will further reduce labour costs in the local government sector. The Government Programme's measures to reduce municipal responsibilities will reduce both local government expenditure and central government transfers to the sector. The lowering of client fees for municipal early childhood education will be compensated by increasing the proportion of revenue from corporation tax going to local government.

Net lending by earnings-related pension funds will contract further in 2018–2020, continuing the trend witnessed since 2007. The surplus on the funds will contract due to relatively strong growth in pension expenditure and, on the other hand, slow growth in asset income amid low interest rates. Other social security funds will continue to post a slight surplus in the forecast period, but the surplus will contract gradually towards more balanced finances. The budgetary position of other social security funds will be

strengthened by lower unemployment expenditure, cuts in the maximum duration of earnings-related unemployment benefits as well as freezing of index increments and reductions in benefits.

Table.

| <i>% of GDP</i> | <i>2016</i> | <i>2017</i> | <i>2018^f</i> | <i>2019^f</i> | <i>2020^f</i> |
|--------------------------------|-------------|-------------|-------------------------|-------------------------|-------------------------|
| General government net lending | -1.8 | -0.6 | -0.8 | -0.6 | -0.3 |
| Central government | -2.7 | -1.7 | -1.7 | -1.1 | -0.6 |
| Local government | -0.4 | -0.1 | -0.3 | -0.4 | -0.4 |
| Social security funds | 1.3 | 1.2 | 1.1 | 0. | 0.7 |
| Primary balance | -0.7 | 0.4 | 0.1 | 0.2 | 0.5 |
| Structural balance* | -1.2 | -0.3 | -1.0 | -1.2 | -0.8 |
| Revenue | 54.2 | 53.2 | 52.1 | 51.3 | 51.3 |
| Expenditure | 56.0 | 53.7 | 52.9 | 52.0 | 51.6 |
| Total tax ratio, % of GDP | 44.1 | 43.4 | 42.5 | 41.9 | 42.0 |
| Debt (consolidated, EDP) | 63.0 | 61.4 | 60.1 | 59.4 | 58.2 |
| <i>Annual change, %</i> | <i>2016</i> | <i>2017</i> | <i>2018^f</i> | <i>2019^f</i> | <i>2020^f</i> |
| Volume of public expenditure | 1.8 | 1.3 | 0.6 | 0.1 | 0.7 |
| Volume of public investment | 5.8 | -2.9 | 2.2 | 0.5 | 0.4 |

* Relative to GDP trend.

f = forecast.

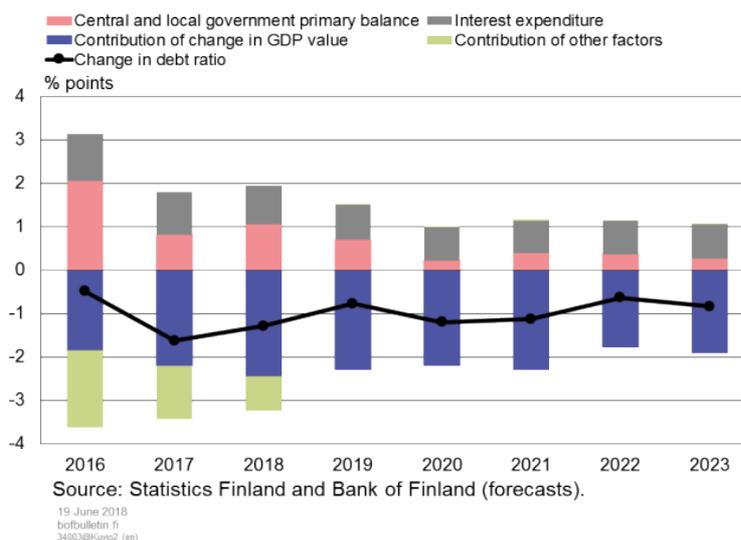
Source: Bank of Finland.

Growth in public debt decelerates and debt ratio declines

Supported by favourable cyclical conditions, Finland's consolidated general government debt relative to GDP will contract below the 60% threshold in 2019. Therefore, in 2019, Finland will comply with both of the reference values defined in the EU Treaty, namely a deficit-to-GDP ratio not exceeding 3% and a debt-to-GDP ratio not exceeding 60%. In absolute terms, public debt will continue to grow in the forecast period, but the debt-to-GDP ratio will decline on the back of GDP growth and low interest expenditure (Chart 17).

Chart 17.

Factors contributing to changes in the debt ratio



Risk assessment: protectionism overshadows export growth

Finnish economic growth in the immediate years ahead will continue to rely on growth in both domestic and foreign demand. The main downward risks relate to the international operating environment, where political uncertainty has heightened again. However, if the external risks do not materialise, short-term developments in domestic consumption and investment may turn out to be better than expected.

Uncertainty about the continuation of euro area economic growth in the immediate years ahead has increased. In the spring, some countries – especially Germany – already witnessed signs of a maturing of the economic cycle. The greatest risks to economic developments relate, however, to heightened political uncertainty and rising protectionism.

The political crisis in Italy continues. The loss in investor confidence in the new government’s programme has led to a rapid rise in the interest rates on Italian government bonds. Higher interest rates and potential funding constraints pose a risk especially to Italy’s already strained banking system, which also has large holdings of domestic government bonds. The problems of the Italian banking sector, if they were to escalate, could threaten financial stability across the euro area as a whole. Italy’s political crisis has been reflected in a depreciation of the euro.

The effects of the United Kingdom’s exit from the EU also continue to weigh on the euro area growth outlook. However, it is difficult to make an advance estimate of Brexit effects, due to the uniqueness of the event.

At the beginning of June, the United States introduced tariffs on steel and aluminium imports from the EU, Canada and Mexico. The US market only accounts for about 3% of

Finnish steel exports, but an increasing proportion of steel supply could, in the near future, be directed to important markets for the Finnish steel industry in Europe. A potential oversupply of steel would rapidly push down steel prices and weaken the profitability of Finnish companies. The US intentions to restrict world trade and trading partners' countermeasures also increase the risk of a more extensive trade war that would depress global growth prospects for a prolonged period.

Besides export market growth, the outlook for Finnish exports also depends on the cost-competitiveness of Finnish exports. The autumn and winter wage decisions were proportional to productivity developments across the economy as a whole, lending support to continued cost-competitiveness. However, the favourable cyclical situation and the rapid tightening of the labour market will increase pressures for higher-than-forecast wage increases.

Estimating the effects of cost-competitiveness has its own difficulties. The improvement in competitiveness is fully reflected in market shares only with a lag. Therefore, exports may still grow notably faster than expected, especially if the upturn in the global economy turns out to be protracted.

The favourable cyclical situation, combined with favourable financing conditions, may encourage companies to invest more than expected. Investment growth may surprise positively, especially in the case of the forest industry, where companies have presented preliminary plans for a number of new plants or extensions.

According to the baseline scenario, the housing construction boom will cool in a controlled manner, but the cyclical turning point in construction may turn out to be stronger than expected. Housing construction typically reacts swiftly to changes in the business cycle. The cyclical nature of housing construction is further heightened by the fact that investors account for a significant proportion of demand for new housing starts.

Positive employment developments will push up household income, especially in the current year. Higher employment will also fuel consumer confidence, which has remained at a record high for several months already. Therefore, private consumption may grow faster than expected, despite the fact that the household savings rate is already low and households are already willing to spend in excess of their income.

However, household indebtedness will increase the economy's sensitivity to cyclical fluctuations. Regional divergence in both indebtedness and wealth developments has increased. Households in growth centres take out larger housing loans than before, while at the same time real estate prices have declined in more remote regions. Household vulnerabilities to higher interest rates, lower house prices and cyclical fluctuations have increased.

Tags

[consumption](#), [economic situation](#), [Finland](#), [forecast](#), [foreign trade](#), [households](#), [inflation](#), [investment](#), [labour markets](#), [private consumption](#) , [non-financial corporations](#)

FORECAST ASSUMPTIONS

International economy and external assumptions

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK

The global economy is still growing strongly, but there are already small signs that the growth rate is levelling off. Growth is still sustained by the effects of the accommodative fiscal policy in the United States and brisk growth in emerging economies. The rising oil price has boosted the economies of oil-producing countries for almost a year. All the while, concerns over the rise of protectionism have increased uncertainty. The growth prospects for the euro area remain good, although the first quarter of 2018 turned out weaker than anticipated – probably due to temporary factors. It is possible that the euro area has reached the peak of the business cycle and growth rates will rise no further. Slower growth in the euro area in 2019 has long been included in the predictions of several major forecasters.



Euro area already reached peak of cycle

According to the ECB's June forecast, the global economy outside the euro area is expected to grow 4.0% in 2018 and slow to 3.9% in 2019, and even further, to 3.7% in 2020. Export demand in the euro area will continue to grow strongly in 2018, but this too will slow in the immediate years ahead. Growth in Finnish export markets will slow down slightly from 2017, but will still remain at 5.2% in 2018, while dropping to 4.3% in 2019 and further, to no more than 3.7% in 2020. The export prices of Finland's competitors will rise 0.3% in 2018, 2.5% in 2019 and around 2.2% in 2020.

Accommodative fiscal policy boosts economic growth in the USA

US GDP grew 2.3% in 2017, and the economy is expected to continue to grow very strongly in 2018 despite the fact that economic growth in the first quarter was slow even there. US growth is supported particularly by an accommodative fiscal policy, including tax cuts introduced under the taxation reform, and by increased public spending. Economic confidence remains strong in the United States. Consumer sentiment has continued to improve, supported in part by the unemployment rate falling below 4%.

Euro area growth flattening out

In 2017, euro area GDP grew by 2.5%, but growth will slow in 2018. The GDP growth rate in the first quarter was well below the ECB's March forecast. Key reasons are temporary factors, such as the harsh winter weather, a severe flu epidemic and the strong exchange rate of the euro against the US dollar. Economic growth in the euro area has relied mostly on domestic consumption. GDP growth fell behind the early year forecast especially in Germany, where industrial output and industrial confidence have evolved poorly in early 2018.

According to the ECB's June BMPE projections, GDP growth in the euro area will stall at 2.1% in 2018, which is three-tenths of a percentage point lower than the ECB assumed in the March forecast. The 2019 forecast has remained unchanged at 1.9%, and the 2020 forecast at 1.7%. Investment is growing strongly in 2018. Exports are also growing briskly, but, due to the rapid growth of imports, net export growth will be moderate in 2018 and turn negative in 2019. The current account surplus of the euro area is therefore expected to be much smaller relative to GDP than expected in the March forecast. Unemployment is still receding, but at a slightly slower pace than forecast in March. The inflation forecasts for both 2018 and 2019 have been revised up by three-tenths of a percentage point, to 1.7%. According to recent projections, unit labour costs will go up this year by almost half a percentage point faster than forecast in March. Growth is still supported by the accommodative monetary policy. The slowing of global economic activity and international trade will gradually begin to erode the euro area's growth prospects, too.

Chinese growth remains strong

The Chinese economy has continued its strong growth, showing only moderate signs of slowing down. China's prospects have, however, been overshadowed by the trade policy conflict with the United States. While it appears that not all protectionist threats will materialise, protectionism remains a downside risk to the economy. China is pursuing a more consumption-driven economic structure and the country's investment ratio has in fact been decreasing for several years. The Chinese financial markets are carrying a lot of risks, as growth is mainly based on debt accumulation by both companies and households. In Russia, output and investment have recovered slowly, but demand has recovered faster and exports have developed well.

Strong demand boosted prices of oil and other commodities

The growth of the global economy and, in particular, Chinese industrial output has raised metal prices. Low interest rates have also increased investors' interest in industrial raw materials. The growing prevalence of electric cars increases demand for the minerals used in their batteries.

The price of crude oil has multiplied since 2016. The increase has been driven particularly by high demand. Supply-related factors have also contributed to the increase, such as pacts to limit production made by OPEC and some other oil countries, the collapse of Venezuelan oil production due to the economic crisis and the United States' decision to reinstate Iranian sanctions. On the other hand, supply has been balanced by the highly increased shale oil production in the United States. Both the sector's productivity growth and rising oil prices have encouraged producers not only to re-open closed oil fields but also to develop new ones. However, capacity constraints currently hamper attempts to significantly increase shale oil production.

The barrel price of oil is predicted to settle at around USD 74.5 in 2018 and expected to come down to USD 73.5 in 2019, and to just under USD 68.7 in 2020. The price is expected to be almost 13 dollars higher in 2018, and around 14.5 dollars higher in 2019 than foreseen in the previous forecast.

Interest rates to rise slowly

The interest rate assumptions in the forecast are derived from financial market prices. Based on market expectations, the assumption for the 3 month Euribor rate in 2018 has remained unchanged at -0.3%, while the assumption for 2019 has been revised down slightly to -0.2%. In contrast, the assumption for 2020 has been revised up by one tenth of a percentage point, to 0.2%.

The assumption concerning yields on Finnish 10-year bonds has been revised up across the board. Yields are expected to gradually rise from 0.8% in 2018 to 1.2% in 2020.

The euro's value relative to the US dollar is assumed to slightly appreciate from 2017. In 2018, the value is assumed to be US 1.20, and over the following two years to be USD 1.18. Finland's trade-weighted exchange rate is assumed to increase (index value 108) from the previous forecast, when the index was at roughly 102.

Table.

Forecast assumptions

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|-------|-------|-------------------|-------------------|-------------------|
| Finland's export markets ¹ , % change | 2.6 | 6.0 | 4.9 | 4.3 | 3.7 |
| Oil price, USD/barrel | 44.0 | 54.4 | 74.5 | 73.5 | 68.7 |
| Export prices of Finland's competitors, euro, % | -4.6 | 3.0 | 0.3 | 2.5 | 2.2 |
| 3 month Euribor, % | -0.3 | -0.3 | -0.3 | -0.2 | 0.2 |
| Finnish 10-year government bonds, % | 0.4 | 0.5 | 0.8 | 1.0 | 1.2 |
| Finland's nominal competitiveness indicator ² | 104.3 | 104.6 | 108.0 | 108.0 | 108.0 |
| US dollar value of one euro | 1.11 | 1.13 | 1.20 | 1.18 | 1.18 |

¹ The growth in Finland's export markets is the import growth in the countries Finland exports to, weighted by their average share of Finland's exports.

² Broad nominal effective exchange rate.

Sources: Statistics Finland and Bank of Finland.

Tags

[economic development](#), [Finland](#), [forecast](#)

ALTERNATIVE SCENARIO

Clouds over the global economy

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK

Finland is a small open economy, and uncertainties in the global economy are also strongly reflected in Finland. The calculations presented here illustrate uncertainties relating to export and GDP forecasts by means of fan charts that demonstrate the uncertainties associated with the external environment. The fan charts incorporate both uncertainties in forecasting external factors and a view of asymmetric risk factors.



Concerns about a rise in protectionism increase the uncertainties for the Finnish economy that stem from the global economy. The political events in Italy also create uncertainty about economic growth in the euro area. The United States and China have imposed import tariffs on a number of products, and there is a risk that such measures restricting international trade may spread further. In addition, the United Kingdom's exit from the EU may also have negative effects on cross-border trade.

An extensive use of restrictions on international trade – i.e. tariffs – and technical barriers to trade would substantially weaken economic growth and global trade. Technical barriers to trade refer to a wide and varying range of regulations and standards related to goods and services and various procedures to assess whether products conform with, for example, certification or licence requirements. Protectionism raises import and export prices and has a negative effect on export market growth and thereby also on economic growth. A small, export-driven country such as Finland is highly dependent on as free cross-border mobility of goods and services as possible.

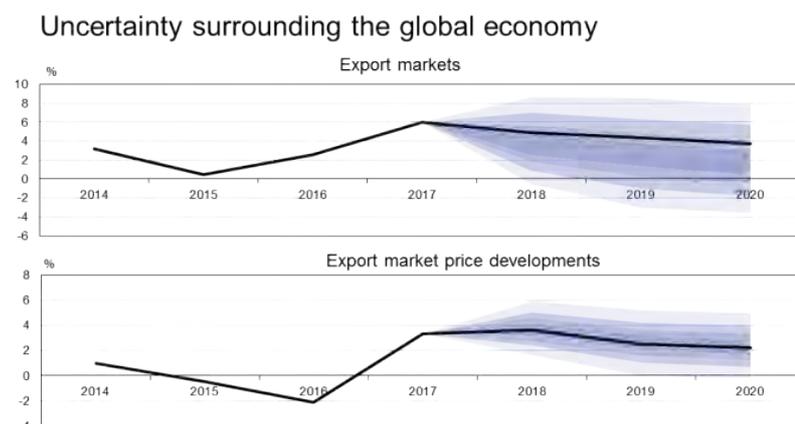
The calculations in this article constitute a sensitivity analysis, where Finnish GDP and export growth are subject to alternative assumptions concerning the export markets, exchange rates and international prices. The covariation of these variables of the global economy has been modelled based on historical data. The model can then be used to create a large variety of alternative forecast paths for the global economy. The forecast paths incorporate a view of the balance of risks surrounding the global economy, produced by constructing asymmetric distributions. The asymmetry of the distributions has been generated by assuming more positive or negative shocks to the baseline scenario.

Export market growth varies around the baseline scenario in a range between -3% and +8% over the forecast period 2018–2020 (Chart 1). The asymmetry of the distribution reflects the view that downward risks to export market developments are slightly higher than upward risks. Export market price developments, in turn, display a spread of 0% to +5%. Price developments are somewhat less asymmetric than export demand developments. For instance, protectionist measures would have direct price-increasing effects due to tariffs, for example. On the other hand, a more moderate global trade growth would have price-decreasing effects via weaker demand.

The alternative paths for the variables of the global economy can be entered into the Aino model to produce a variety of alternative forecasts for Finnish GDP and export growth. Export growth varies around the baseline scenario in a range from about -3% to +8% over the forecast period 2018–2020 (Chart 2). The alternative forecast paths for exports are tilted towards negative outcomes, reflecting the risks to export market developments. GDP growth varies in a range from -1% to +4% in the forecast period. As in the case of exports, the distribution of alternative paths for GDP growth is skewed downwards.

The calculation shows that, for economic growth to come to a complete standstill, export markets would need to contract for several years. However, the probability for this, and therefore also for a halt in economic growth during the forecast period, is very small.

Chart 1.

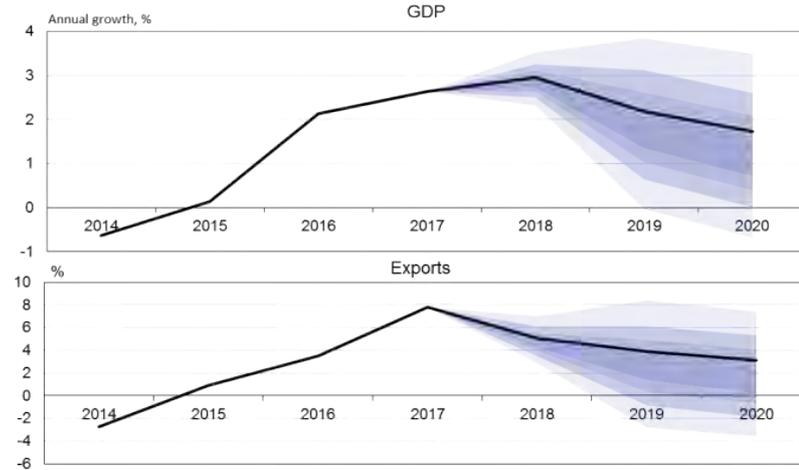


Sources: European Central Bank and calculations by the Bank of Finland. The different shades of colours represent 90%, 70%, 50% and 30% probability intervals.

19 June 2018
 bofbulletin.fi
 35445@kuuvi1 (en)

Chart 2.

Uncertainty stemming from the global economy



Sources: European Central Bank, Statistics Finland and calculations by the Bank of Finland. The different shades of colours represent 90%, 70%, 50% and 30% probability intervals.
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35463@kuviot(en)

Tags

[economic growth](#), [exports](#), [export markets](#), [fan chart](#), [gross domestic product](#)

First quarter of 2018 sees a surge in investments

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK

According to the most recent quarterly national accounts, Finland's GDP in the first quarter of 2018 grew 1.2% quarter-on-quarter and 3.1% year-on-year. The data signal similar economic developments for early 2018 to those previously estimated, i.e. the economy continued its strong growth. Private investment in particular increased as building and investment in machinery continued to grow at a brisk pace. GDP growth in the first quarter of 2018 was only slightly stronger than suggested by the flash estimate published in May, while GDP figures for the fourth quarter of 2017 were revised upwards. The Finnish economy has now grown for ten consecutive quarters.



On 1 May 2018, Statistics Finland published preliminary quarterly national accounts containing the latest statistical data on Finnish economic developments in the first quarter of 2018 and revised data on quarterly developments in 2017.

The Bank of Finland's June 2018 macroeconomic forecast is based on the quarterly national accounts published by Statistics Finland in March, a flash estimate for the first quarter released in May and extensive indicator data on economic developments.

According to the most recent quarterly national accounts, GDP in the first quarter of 2018 grew 1.2% quarter-on-quarter and 3.1% year-on-year. According to the flash estimate published in May, the increase in GDP in the first quarter was 1.1% quarter-on-quarter and 2.8% year-on-year.

Following the revision, the GDP growth rates for the last quarter of 2017 were revised up by 0.3 of a percentage point from the preliminary estimates. Hence, GDP in the fourth quarter of 2017 grew 0.9% on the previous quarter. This increases the carry-over effect

for 2018 to 0.9 of a percentage point. GDP growth for 2017 as a whole was also revised up by 0.1 of a percentage point, to 2.7%. In December 2017, the Bank of Finland forecast that growth would climb to 3.1%.

Rapid growth in investment

According to the latest national accounts, growth in the first quarter of 2018 stemmed mainly from private demand. Private consumption increased 1% on the previous quarter and 3.3% year-on-year. Private investment was 4.2% up quarter-on-quarter and 9.4% up year-on-year. In particular, the volume of investment in machinery, equipment and transport equipment grew 15.6% during the year. For its part, housing investment increased 3.8% on the previous quarter and 9.3% year-on-year. On the whole, domestic demand increased 1.3% on the previous quarter and 3.2% year-on-year. Public consumption was 2.6% up, but public investment 2.8% down on the previous year.

By contrast, the volume of Finnish exports remained poor in the first quarter as a result of the decrease in services exports. However, a high degree of uncertainty is related to the statistical reporting of services exports, and numbers may fluctuate significantly between quarters. The volume of goods exports grew substantially, which was in line with the indicator data published earlier in the spring. Nonetheless, the volume growth of all Finnish exports declined in the first quarter of 2018 by 1.1% on the previous quarter. Even though imports simultaneously dropped by 0.5%, the overall impact of net exports on growth decreased from the previous quarter. Goods exports were 2.1% up on the previous quarter, while services exports dropped by 2.1%. However, the surge in investment in machinery and equipment as well as in industrial output during the first quarter suggests that exports will improve in the future.

Manufacturing continued to grow strongly

The volume of manufacturing value added grew 4.0 % quarter-on-quarter. Growth was pronounced across all main industrial groupings apart from the forest industries. Metal industry output was 5.3 % up quarter-on-quarter, and 5.9 % on a year earlier. Electrical engineering and electronics also witnessed significant growth, with the volume of value added increasing 11.1% on the previous quarter and 5.6% on the previous year. The chemical industry also grew notably.

Activity in the construction sector has remained buoyant. The value added of construction was 3.2% up quarter-on-quarter and 6.6% up year-on-year. Housing construction, in particular has continued to grow strongly.

Growth in the service industries was also broadly based, with the financial and insurance sector being the only sector showing negative growth. The value added of the private services industry grew 3% on the previous year, while value added in public services increased 1%. Growth in the services industries was supported by e.g. growth in the volume of trade, transport and business services.

Labour input increased in early 2018. According to the national accounts, the number of persons employed rose in the first quarter of 2018 by 2.3%, and the number of hours

worked increased 2.1% on the previous year. Growth in the wage bill picked up to 4.3% year-on-year.

The latest quarterly national accounts data signal similar economic developments for early 2018 as estimated on the basis of the previously published statistical and indicator data, i.e. economic growth has remained strong.

Tags

[exports](#), [investment](#), [private consumption](#) , [quarterly national accounts](#)

Inflation now explained by different factors than during the recession

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The GDP deflator reflects the cost-competitiveness of Finnish production better than consumer prices do. Changes in the GDP deflator describe the change in prices of goods and services produced in Finland regardless of whether they are consumed in Finland or abroad.



Inflation according to the GDP deflator is not the same as inflation based on the consumer price index. The rate of growth of consumer prices depends not only on domestic production but also on the price development of consumed commodities that have been imported. The advantage of the GDP deflator compared with the consumer price index is that it can be defined as a sum of income per unit of output and thereby determine to what extent inflation trends depend on various domestic cost factors. Despite differences in price concepts, changes in the GDP deflator and the consumer price index follow each other closely, because Finnish households mainly consume products and services produced in Finland.

Price developments followed economic cycle

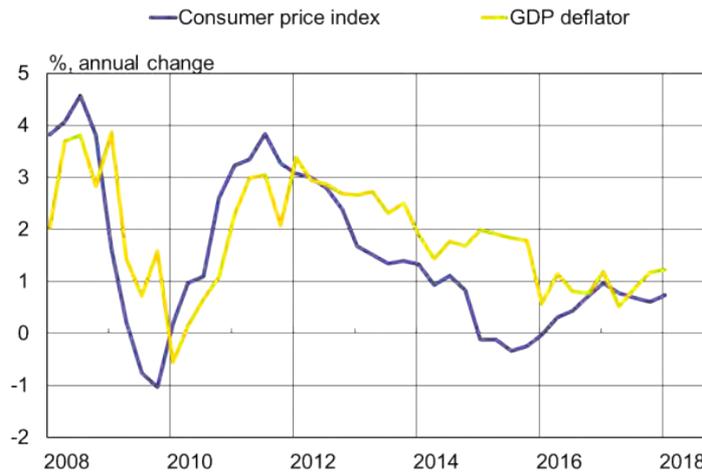
Measured with the GDP deflator, inflation in 2008–2017 averaged 1.7%, reasonably closely mirroring consumer price inflation (Chart 1).

After the financial crisis, the rate of inflation closely followed the economic cycle, in terms of both consumption and production prices. During the deepest part of the recession, the growth rate of prices in domestic production temporarily entered negative

territory, in 2010. As the economy recovered temporarily in 2011–2012, so did the costs of production factors, and inflation accelerated to about 3%. In 2012, however, inflation began to decline more permanently, and not even the current economic upswing is reflected in the rate of inflation. During 2015–2017, the annual rate of price increase has for the most part been under 1%, measured by both the consumer price index and the GDP deflator.

Chart 1.

Consumption and production prices developed similarly



Source: Statistics Finland.
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Production price increase is the sum of many factors

The value of GDP is calculated in the national accounts as the product of real GDP (GDP) and its price (P). The value of GDP is also equal to the income created to produce it, including taxes paid thereon. This remuneration of the factors of production comprises wages and salaries, employers' social security contributions, corporate operating surpluses, and the net taxes paid by companies and employees for production and import:

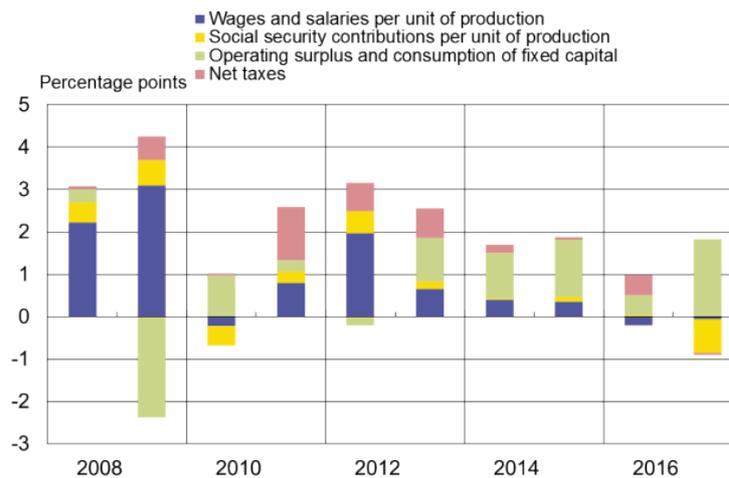
$$\begin{aligned}
 P * \text{GDP} = & \\
 & \text{wages and salaries} + \\
 & \text{employers' social security contributions} + \\
 & \text{gross corporate operating surplus} + \\
 & \text{production and import taxes} - \text{subsidies} + \\
 & \text{consumption of fixed capital}
 \end{aligned}$$

Dividing the income items by GDP volume enables calculation of the growth rate of the GDP deflator as the sum of the changes in national income per unit of output.

Chart 2 shows how many percentage points various types of income per unit of output have contributed to the annual GDP inflation rate in 2008–2017. Operating surplus refers to either a surplus or deficit caused by business activity, i.e. once intermediate consumption, wage and salary costs including social security contributions and net taxes have been subtracted from the value of production. Operating surplus has been defined in the chart in net terms, i.e. once not only wage and salary costs and net taxes, but also consumption of capital has been subtracted from corporate added value.

Chart 2.

Factors contributing to growth in GDP deflator



Sources: Statistics Finland and Bank of Finland.

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At the beginning of the review period, in 2008–2013, the rise in the price of domestic production was largely due to a rapid rise in unit labour costs. Unit labour costs refer to compensation of employees per unit produced, consisting of not only wages and salaries but also social security contributions paid by employers. The effect on inflation from each of these is reported separately in the chart.

The change in unit labour costs may also be divided into the change in the wage sum and the change in labour productivity. Of these, a rise in wages and salaries accelerated inflation by an average of 1.7 percentage points per annum, which accounted for about three quarters of the cumulative increase in production prices. The proportion of the increase in annual inflation due to social security contributions averaged 0.3 of a percentage point over the same period.

The rise in wages and salaries was rapid, especially in the early part of the recession, due to the high general pay increases agreed for 2008 and 2009. Average pay per employee in 2008–2010 increased by about 3.1% per annum.

The rise in unit labour costs was also accelerated by poor development of labour productivity, as the number of employees fell only moderately compared with the lower production figures. In 2009 alone, productivity per employee declined by 6.0%. Productivity improved temporarily in 2010 during an economic upswing, but after that productivity remained unchanged for a prolonged period, occasionally even dipping into

negative territory. Labour productivity growth in 2008–2013 contracted by an average of 0.8% per annum.

Owing to the recession and a rise in unit costs, companies had to lower their profitability targets, which helped to moderate the rise in production costs. The effect of smaller operating surpluses on the price of production was an average of -0.7% in 2008–2013.

During the deepest recession, net operating surpluses were eroded not only by poor profitability but also by erosion of the capital stock, exacerbated by structural changes in industry that coincided with the recession. The quick contraction of the electrical engineering and electronics industries made part of the existing capital base redundant. The eroded capital base contributed an average of almost 0.9 of a percentage point per annum of the price growth rate.

After the middle of the current decade, the Finnish economy began to recover gradually from recession, helped in part by better corporate cost-competitiveness. Non-financial corporations have been able to recover some of the profitability they lost during the recession partly because pay increases have been low in recent years. In 2014–2016, average pay increased by only about 1% per annum. Towards the end of the review period, unit labour costs fell largely as a result of the Competitiveness Pact signed in 2016.

In fact, growth in unit labour costs only accounts for 0.1 of a percentage point of the speed of growth in production costs in the period 2014–2017. Growth in unit labour costs has, in addition to low pay increases, been limited by labour productivity development, which in 2014–2016 increased by an average of 0.7% per annum.

Seen from this point of view, the rise in production prices has since 2014 been mostly in connection with larger corporate operating surpluses. As the economy has improved, so has corporate pricing power, enabling companies to increase their prices and thereby improve their profitability. Operating surplus growth accelerated inflation in 2014–2017 by an average of 1.2 percentage points per annum, accounting for about 90% of the total increase in prices. Consumption of capital only accounted for about 0.1 of a percentage points of this. Now that the most rapid phase of industrial restructuring has been concluded, the capital base is also being consumed at a slower rate.

The effect of higher taxes on inflation was at its height in 2016, when net taxes accounted for almost 0.5 of a percentage point of the growth in production costs. On the other hand, increases in non-wage labour costs have not caused any major inflationary pressures in recent years. In 2017, employment-related social security contributions actually decreased as non-wage labour costs paid by companies were reduced as part of the Competitiveness Pact. Lower social security contributions slowed inflation by about 0.8 of a percentage point.

Based on the inflation decomposition presented here, inflation is now explained by other factors than during the recession. In the years since the financial crisis, all the way until about 2015, price increases were explained primarily by rises in unit labour costs. Unit labour costs were pushed up by a relatively rapid rise in wages and salaries coupled with weak labour productivity. Following the turn in the economic cycle, growth in unit labour

costs slowed down, and inflation as measured by production prices has been most clearly linked to higher corporate operating surpluses.

Tags

gross domestic product, operating surplus, production price, unit labour costs

Unemployment rate in Finland close to structural level

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According to the Bank of Finland's structural unemployment indicator based on labour market flows, the unemployment rate in Finland is close to its structural level. The flow out of unemployment has strengthened, while the flow into unemployment has moderated. Both have contributed to a reduction in the actual unemployment rate, but for the time being this would appear to be related to cyclical changes, without actually reducing the structural unemployment rate.



Structural unemployment based on labour market flows is determined on the basis of trends in said flows.^[1] Contrary to the NAIRU (non-accelerating inflation rate of unemployment) method, structural unemployment based on labour market flows is not based on wage inflation; it is an estimate of the unemployment rate discounting cyclical conditions.

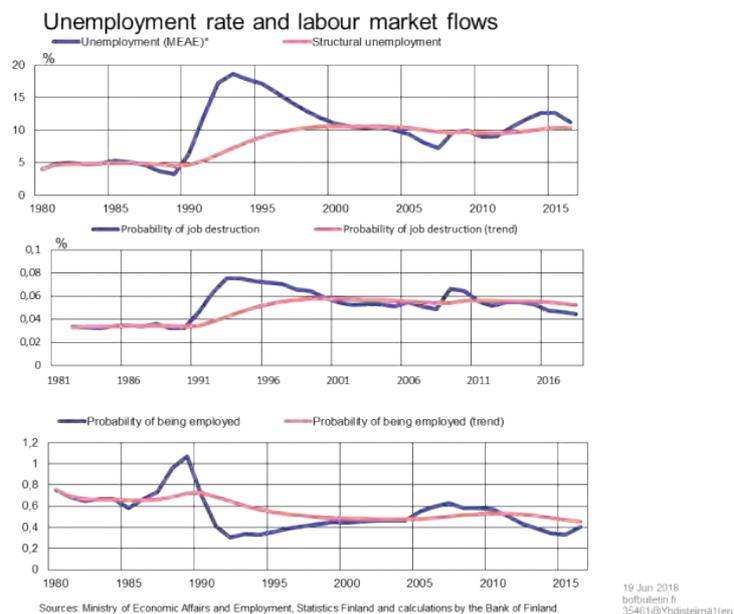
The unemployment rate based on the employment service statistics of the Ministry of Economic Affairs and Employment has fallen substantially since 2015 (Chart 1). The initial cause for this was that the flow into employment slowed as job destruction ebbed with the end of the prolonged recession. The probability of job destruction is now at its lowest level since the 1990s recession, and also lower than the cyclically adjusted trend.

The flow out of unemployment has strengthened in recent years, which is reflected in a rise in the probability of being employed. After the financial crisis, employment

1. The Bank of Finland's structural unemployment indicator was presented in the article "[A new method to measure structural unemployment via labour market flows](#)".

probability fell for a long period, and the rise in recent years has not yet lifted employment probability higher than the estimated trend.

Chart 1.

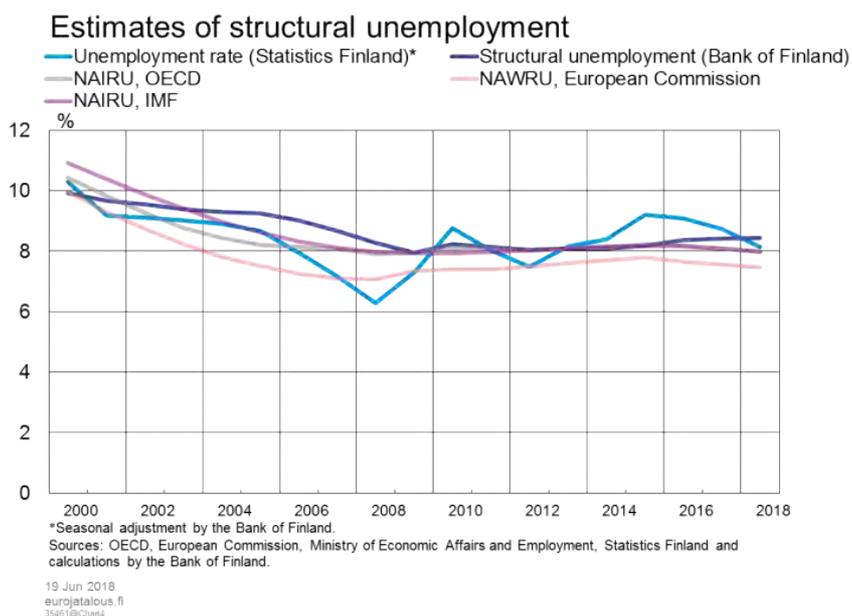


Structural unemployment is high, because the trend for job destruction is high while the employment probability trend is low. Structural unemployment rose in Finland after the 1990s recession to an unprecedented level and has remained almost unchanged ever since. Not even the prolonged period of positive growth before the financial crisis has returned labour market flows to their level prior to the 1990s recession, which would indicate that the structures of the Finnish economy and labour market support a high level of unemployment.

It is, however, likely that, if the current growth continues, structural unemployment may also be reduced as a result of what is known as reverse hysteresis: when growth continues for long enough, jobseekers with less competence and experience may also find work, improve their competence level and thereby also their employment probability. Structural unemployment may indeed be reduced in the future through better employment probability, because job destruction probability is already at its lowest since the 1990s recession, and there may not be that much room for it to fall any lower.

Compared with the structural unemployment estimates by international organisations, the structural unemployment indicator value of the Bank of Finland is much higher (Chart 2). This difference may be explained by the fact that in estimates by international organisations using the NAIRU method, the level of structural unemployment is affected by the moderate level of realised price and wage increases. In recent years, the slow developments in prices and wages may also have been influenced by factors other than free capacity on the labour market. Structural unemployment is nevertheless high, even according to international organisations, because the difference with the realised unemployment rate is only about one percentage point.

Chart 2.



Breaking down the unemployment rate into cyclical and structural factors is difficult in real time, meaning that estimating the level of structural unemployment rate involves a great deal of uncertainty. However, many other indicators support the view that the measured unemployment rate is very close to the structural level. Companies are reporting increasing recruiting problems, and the average time until vacancies are filled has been getting steadily longer. The percentage of all unemployed people who are long-term unemployed is still high, although the gap has been narrowing since the beginning of 2017. The Beveridge curve, which represents the relationship between jobseekers and the job vacancy rate, also indicates high structural unemployment. On the other hand, there is very little to show that the unemployment rate is currently notably higher than its structural level. The amount of free capacity on the labour market is therefore probably very low.

Tags

[labour market flows](#), [structural unemployment](#), [unemployment](#)

Are weakly profitable firms suppressing economic growth?

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK



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Unprofitable ‘zombie’ firms have been on the rise in Finland, both proportionately and in absolute terms, since the beginning of the 2000s. At most, they have accounted for approximately 10% of all labour and capital allocated within the corporate sector. Zombie firms can survive for years, but in the long term they must either revitalise and become profitable or exit the market. Keeping unprofitable firms on life support for extended periods of time can distort the efficiency of markets and is associated with a variety of risks. For one, the share of capital and labour allotted to zombie firms prevents these resources from being allocated more efficiently elsewhere, weakening operating conditions for profitable companies. This opportunity cost lowers productivity and weakens growth opportunities for the entire economy. Furthermore, zombie firms are generally highly leveraged and raise the risk of credit defaults and financial market disruptions. Identifying zombie firms is not entirely straightforward, however, as the classification is in itself heterogeneous and includes growing companies with weak current profitability who may, in the long term, eventually contribute to economic growth.



Satu Nurmi, Head of Research at Statistics Finland, has also contributed to the article preparation.

The growth literature has largely focused on successful, rapidly-growing ‘gazelle’ or ‘superstar’ companies, and efforts have been made to understand how these firms contribute to the aggregate growth and productivity of an economy. In recent years, interest has also turned towards the weakly performing but resilient firms who may in fact be a drag on the economy.^[1] Here, there has been interest in assessing whether the economic policies practised after the financial crisis have helped sustain, or indeed expand, the share of these ‘zombie firms’.

The proportion of insolvent or unprofitable zombie firms has increased in Finland since the turn of the millennium, in a trend widely seen in other OECD countries. In several studies, a zombie firm is defined as a business whose earnings before interest and taxes (EBIT) do not cover its interest payments nor other financing costs over three consecutive years. These companies serve as a drag on economic growth, as their productivity is generally lower than that of other firms and the resources allocated to them could be used more efficiently elsewhere. Studies also indicate that when weakly performing firms compete for the same pool of capital and labour resources as more successful businesses, profitable companies see their growth conditions diminished.^[2] As a result, even a relatively low share of zombie firms can have negative repercussions for economic growth and productivity.

In this article, we analyse the relative growth of weakly performing firms and their share of resource utilisation since the turn of the millennium. We evaluate the idiosyncrasies of zombie firms in light of firm-level data and assess their impact on their respective sectors. In addition, we offer reflections on why weakly performing firms are able to demonstrate such surprising longevity.

Zombie firms devour economic resources

Productivity is determined by how efficiently firms are able to utilise an economy's resources; hence, productivity can grow when labour and capital are increasingly allocated towards companies who are in and of themselves productive. Well-functioning markets are characterised by a process of creative destruction where efficient and productive firms grow, while weaker and less productive companies shrink and eventually exit the market.

In the literature, various alternative definitions of ‘zombie firms’ exist, but they are generally all based on a measure of a firm’s profitability. In this article, we share the OECD's favoured definition and identify zombies as firms whose interest coverage ratio (the ratio of operating income to interest expenses) is less than one ($EBIT/interest < 1$) over three consecutive years.^[3] In practice, this means that a company must take on additional debt to cover its interest payments.

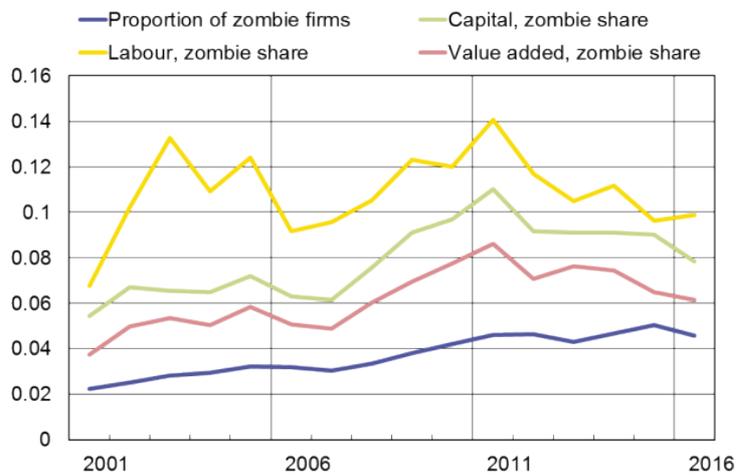
1. See, for example: Acharya, Viral; Eisert, Tim; Eufinger, Christian and Hirsch, Christian, 2017. ‘Whatever it takes: The real effects of unconventional monetary policy’, SAFE Working Paper Series, No. 152; Adalet McGowan, Muge, Andrews, Dan & Millot, Valentine, 2017; ‘The Walking Dead?: Zombie Firms and Productivity Performance in OECD Countries’, OECD Economics Department Working Papers 1372. Of all the firms identified as zombies by these studies, approximately 85% have negative operating incomes.

2. Adalet McGowan et al. (2017), Caballero, Ricardo J., Hoshi, Takeo & Kashyap, Anil K. 2008. ‘Zombie Lending and Depressed Restructuring in Japan’, American Economic Review, vol. 98(5), 1943–1977, December.

In Finland, the proportion of zombie firms has increased over the years 2000–2015 as part of a wider trend observable within the OECD, although Finland's relative share of zombies still remains smaller than that of many other European countries. In Finland, zombies have at most constituted less than 5% of all companies, while in Belgium and Spain, for example, the corresponding figures are near 10%.^[4] Even so, focusing too heavily on the proportion of zombies belies their economic impact, as their ubiquity is far outweighed by the amount of resources (i.e. capital and labour) sunk into them. Furthermore, zombies are notably overrepresented in their combined share of value added and indebtedness, which suggests that zombies include a considerable number of large firms (Chart 1).

Chart 1.

Proportion of zombie firms and their combined shares of employment, capital and value added.



Sources: Statistics Finland and Bank of Finland.

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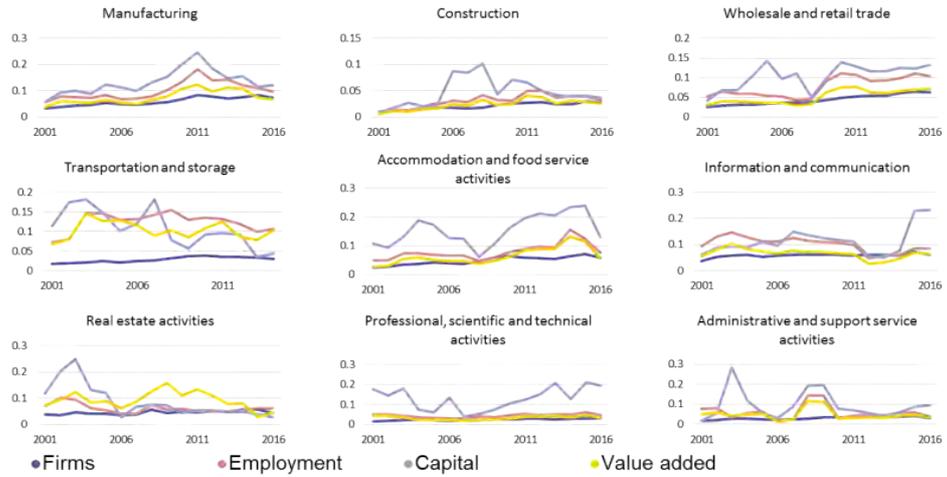
While the proportion of zombies has increased across all sectors, there are different patterns in the amount of resources that are sunk into zombies in each sector (Chart 2). Broadly speaking, the secular rise of unprofitable firms remained relatively slow in the years preceding the financial crisis. During the crisis this accelerated somewhat, seemingly driven by cyclical conditions. The crisis was followed by a slight recovery, but the share of unprofitable companies has once again increased in most sectors since 2011–2012, although cyclical growth slightly mitigated this trend in 2016.

3. It is interesting to note that the definition of zombies based on $EBIT/interest < 1$, adopted by the OECD as well as this research paper, is particularly robust, as it does well in classifying firms as zombies and non-zombies. Hence, if we inspect 'near-zombies', for whom $1 < EBIT/interest < 2$, we see a variety of results. Alternative metrics that appear in the literature include: (i) firms with negative profits, (ii) firms whose value-added is negative or (iii) firms who are extended leveraged loans.

4. See Adalet McGowan et al. (2017).

Chart 2.

Sectoral decomposition of zombie firm % as well as zombie % weighted by employment, capital and value added, 2000–2016

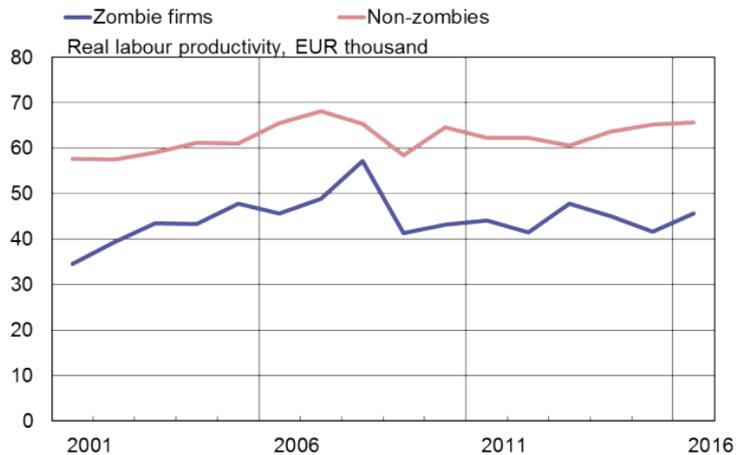


Sources: Statistics Finland and Bank of Finland.
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Zombies generally suffer from less-than-average productivity compared with most other firms (Chart 3). This effectively restricts economic growth, as the capital and labour resources sunk into zombies could, in principle, be allocated towards more efficient production.

Chart 3.

Labour productivity in zombie firms and non-zombies, EUR thousand, 2000-2016



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‘Too big to fail’

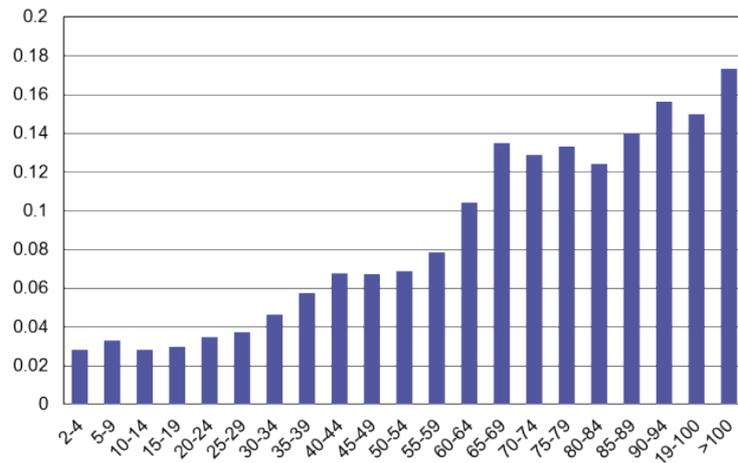
It is standard practice to identify zombies on the basis of a single weak performance metric, but this easily includes firms who are growing and whose weak profitability is often temporary. For example, investment involves a necessary trade-off between short-

term costs and future productivity and profitability growth, which may cause performance metrics to ostensibly decline before revenue catches up. Start-up companies are particularly vulnerable to this.

The above notwithstanding, Finland's zombie firms can be characterised neither as small nor young (Charts 4–5). In fact, the share of zombie firms appears to rise in proportion with age and size, which is to say that, relatively speaking, the largest demographic of zombies can be found within the ranks of large and well-established firms. In the literature, this observation has been attributed to the ‘too big to fail’ theory: large firms, who may be seen as indispensable regional employers, are not allowed to collapse due to the threat of higher unemployment.

Chart 4.

Decomposition of zombie firm % by age-class, 2000-2016.

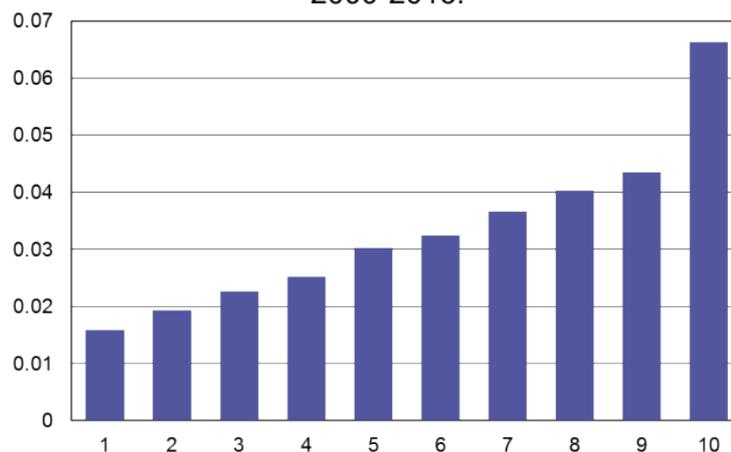


Sources: Statistics Finland and Bank of Finland.

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Chart 5.

Decomposition of zombie firm % by firm size decile, 2000-2016.



Sources: Statistics Finland and Bank of Finland

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Growing firms also dubbed ‘zombies’

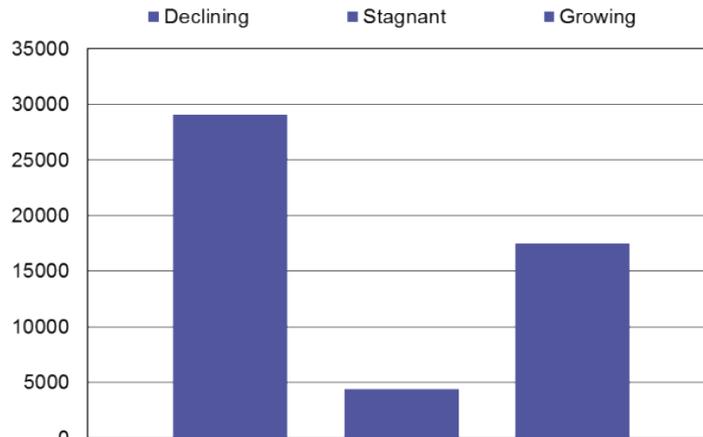
A closer inspection of firm-level data reveals that many of the firms identified as zombies are companies who are seeing growth. Weak profitability may only be a temporary issue for a significant number of these firms, and many of them might even contribute to economic growth in the long term. Of all zombie firms, approximately one third are seeing growth (over +1% annualised), and this share is even larger among companies with at least 20 employees (see Chart 6).^[5]

Some recent studies (e.g. Adalet McGowan et al., 2017) have implemented an age restriction to separate real zombies from start-up companies who may still have comparatively high operating costs and low revenue. This adjustment, however, does not fully resolve the issue, as up to one-third of comparatively geriatric zombies see growth but otherwise satisfy the OECD's definition of a zombie firm.

5. Firms are divided into three categories based on their average annualised employment growth rate over a three-year period: 1) declining (negative growth at over -1% per annum); 2) stagnant (growth between -1% and 1% per annum); 3) growing (over 1% per annum).

Chart 6.

Declining, stagnant and growing unprofitable firms



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Weakly profitable firms inhibit productivity and employment growth

In the literature (e.g. Caballero et al 2008; Adalet McGowan et al. 2017), it has been observed that the survival of zombie firms may distort competition and weaken market efficiency. Healthy markets are characterised by a process of creative destruction, where insolvent or unprofitable companies reduce their share of labour and successful companies invest and create new jobs. When zombies participate in the market, they raise demand for labour and intensify competition for market share. This has the consequence of lowering product prices and increasing wages, effectively congesting growth conditions for more promising firms.

By evaluating not only firm-specific data but also estimates of the sectoral decomposition of zombie shares, we can attempt to quantify the impact that zombies have on production and employment growth. The use of sectoral estimates is based on the notion that if a large share of any given sector's labour, capital, output or sales is held by zombie firms, this will negatively impact the performance of the entire sector and especially weaken growth conditions for more robust companies. To verify this phenomenon, we use the panel data to model corporate growth in the 2000s. Growth in employment or output is determined by whether a firm is a zombie or non-zombie and how large the zombie share is of the sector's capital or labour (multiplied by the non-zombie dummy variable). In other words, our specification takes the form:

$$\Delta \log(L_{it}) = \alpha_{i0} + \alpha_1 \text{Zombie}_{it} + \alpha_2 \text{cross_Z}_{it} + \text{controls} + \mu_{it}$$

Table 1.

How does the volume of zombies firms affect growth?

| Specification | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| zombie | -0.113 | -0.105 | -0.102 | -0.082 | -0.118 | -0.105 | -0.093 | -0.023 |
| | (79.82) | (73.57) | (62.92) | (191.20) | (44.43) | (39.37) | (32.01) | (45.32) |
| cross_z | -0.021 | -0.005 | -0.009 | 0.048 | -0.024 | 0.003 | -0.004 | -0.021 |
| | (6.40) | (1.27) | (2.23) | (10.49) | (3.97) | (0.60) | (0.60) | (13.42) |
| controls | none | years | years | years | none | years | years | years |
| | | sectors | sectors | sectors | | sectors | sectors | sectors |
| R ² | 0.0044 | 0.0094 | 0.0028 | 0.000 | 0.0015 | 0.0054 | 0.004 | 0.0004 |
| dependent variable | ΔL | ΔL | ΔL | ΔL | Δy | Δy | Δy | Δy |
| model | RE | RE | FE | FE, W | RE | RE | FE | FE, W |

| Specification | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| zombie | -0.121 | -0.104 | -0.100 | -0.077 | -0.135 | -0.093 | -0.094 | -0.020 |
| | (84.62) | (70.45) | (59.42) | (172.82) | (48.87) | (38.46) | (30.77) | (38.052) |
| cross_z | -0.162 | -0.002 | 0.014 | 0.048 | -0.240 | -0.012 | 0.001 | 0.011 |
| | (25.56) | (0.25) | (1.68) | (22.28) | (20.90) | (0.91) | (0.08) | (4.48) |
| controls | none | years | years | years | none | years | years | years |
| | | sectors | sectors | sectors | | sectors | sectors | sectors |
| R ² | 0.0045 | 0.0094 | 0.0028 | 0.000 | 0.0015 | 0.0054 | 0.023 | 0.0004 |
| dependent variable | ΔL | ΔL | ΔL | ΔL | Δy | Δy | Δy | Δy |
| model | RE | RE | FE | FE, W | RE | RE | FE | FE, W |

In the table, the dependent variables are either the growth rate of employment ΔL or output (real value added) Δy . The *cross_z* term denotes the capital (equations 1–8) or labour (equations 9–16) share of zombie firms multiplied by the non-zombie dummy variable. Controls are dummy variables for different years (15) and sectors (55). The panel data comprise 1,484,457 observations. RE and FE stand for random and fixed

effects, respectively. W means that the observations for each firm have been weighted by its number of employees.

The results are relatively easy to interpret: As expected, weakly profitable firms see much slower growth on average than profitable firms. There is also evidence which suggests that a large share of zombies will hinder employment growth in the entire sector; however, this observation is slightly sensitive to the control variables and weighting. This would seem to indicate that overall competitiveness and market conditions influence the degree to which zombies might impact the performance of any given sector.^[6]

Do business subsidies sustain zombies?

The surprising longevity of many zombie firms might be explained by factors found within the firms themselves or other factors determined by their operating environment. According to the literature, the latter may include government business subsidies (e.g. Jiang 2017), subsidised lending to insolvent firms, and large holdings of non-performing corporate loans on banks' balance sheets, such as in Japan in the 1990s (see e.g. Hoshi 2000, Caballero et al. 2008). More recent studies have also examined how unusually low interest rates might affect the survival of zombie firms (e.g. Adalet McGowan et al. 2017, Acharya et al. 2016, Borio 2018).

Thus far, relatively little is known on how business subsidies might impact the survival rate of zombies. Corporate subsidies come in many forms and may be expected to have different effects on zombies, at least quantitatively speaking. This plurality is also reflected in our research data.

It is feasible, however, that one reason why zombies are able to endure for year after year might be that they receive an inordinate share of subsidies (e.g. employment and start-up grants). We tested this hypothesis against our panel data by evaluating the correlation between business subsidies and weak profitability using a simple regression model:

$$\text{Zombie}_{it} = \alpha_{i0} + \beta_1 \text{Zombie}_{it-1} + \beta_2 \text{share}_{it} + \beta_3 \text{d_subs}_{it} + \text{controls} + \mu_{it}$$

The dependent variable in the model is an indicator variable, which determines whether a firm is a zombie or not. In other words, the variable receives the value 1 if a firm is a zombie and the value 0 when it is not. The model has two independent variables related to business subsidies: 'share' denotes the zombie share of subsidies in each industry, while d_subs is an indicator variable that shows whether the firm has received subsidies.

The model is based on the presumption that weakly performing firms receive more subsidies than average. It is also possible that such firms are more prevalent in specific sectors where weakly performing firms receive more subsidies in general.

Table 2.

6. Adalet McGowan (2017) also presents a counterfactual calculation to explore how a contraction in sectoral zombie shares, back to their respective minimum levels in each country, might influence investment and employment performance. These calculations demonstrate a significant effect.

How business subsidies affect the share of zombies?

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|------------------------------------|----------|-----------|----------|----------|----------|---------------------|
| zombie _{it-1} | 0.281 | 0.606 | 1.136 | 3.651 | 2.918 | 0.272 |
| | (475.53) | (1057.78) | (223.75) | (163.61) | (140.79) | (453.84) |
| share | 0.078 | 0.021 | 0.665 | 0.909 | 1.257 | 0.023 |
| | (48.78) | (32.02) | (41.87) | (20.59) | (30.54) | (12.35) |
| d_subs | 0.049 | 0.014 | 0.335 | 0.155 | 0.665 | 0.041 |
| | (51.88) | (35.21) | (39.73) | (7.36) | (36.42) | (42.12) |
| controls | years | years | years | years | years | years, sectors, age |
| R ² /sigma _u | 0.1318 | 0.2949 | 1.268 | 0.961 | 1.287 | 0.1362 |
| model | OLS, RE | OLS, RE | Logit | Logit | Logit | OLS |
| zombie | Z1 | Z2 | Z1 | Z3D | Z3G | Z1 |

The independent variable is an indicator variable which denotes zombie firms; share indicates the zombie share of subsidies in each industry; d_subs is a dummy variable that denotes whether a firm has received subsidies; OLS denotes a linear probability mode; Logit denotes logit estimates; Z1 (Z3) denotes a 'one-year (three-year) zombie firm'. (Lagged) values for years, sectors and potential ages are 15, 55 and 115, respectively.

Based on this simple regression analysis, business subsidies would appear to influence the overall quantity and sectoral distribution of zombies. It is difficult to assess the degree of causality, as our variable indiscriminately includes all (paid) subsidies, but the effects of different subsidies may vary considerably based on their type and the criteria by which they are granted to firms. Nonetheless, researching the effects of business subsidies warrants much further analysis, even in light of these very preliminary results.

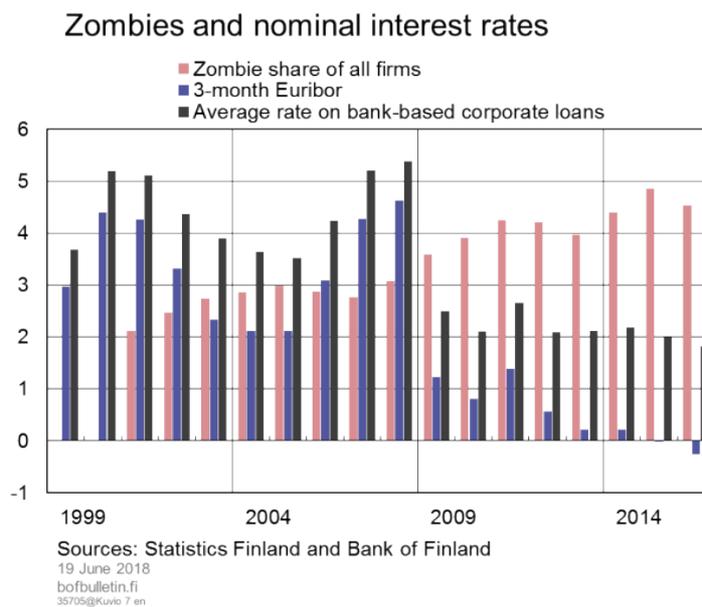
Low interest rates and firms' interest rate margins

What other factors might allow for weakly profitable firms to endure in markets? More recently, the literature (e.g. Adalet McGowan et al. 2017; Borio 2018) has focused on the possible impact of low interest rates. The effects of providing insolvent firms with credit subsidies in the form of lower interest rate margins has previously been studied in relation to Japan's economic downturn in the 1990s (e.g. Hoshi 2000; Caballero et al. 2008).

Broadly speaking, it would seem that the proportion of weakly profitable firms increases (decreases) during periods of low (high) interest rates. As is well established, nominal and real rates declined between 2001 and 2005, and again after 2008 (Chart 7). The proportion of weakly profitable firms increased during both time periods, especially after the financial crisis. However, these periods were also characterised by diminished economic growth, which weakened firms' profitability across the board and increased the likelihood of businesses turning into zombies.

When assessing the impact of low interest rates on the proportion of zombie firms, it is important to bear in mind that interest rates respond to the performance of the economy. Low interest rates do not in and of themselves cause weak earnings growth, it is the sluggish economy that erodes the profitability of firms. Even though a low interest rate environment may prevent the weakest of firms from collapsing altogether, a decline in risk-free interest rates does not distort relative prices on financial markets.

Chart 7.

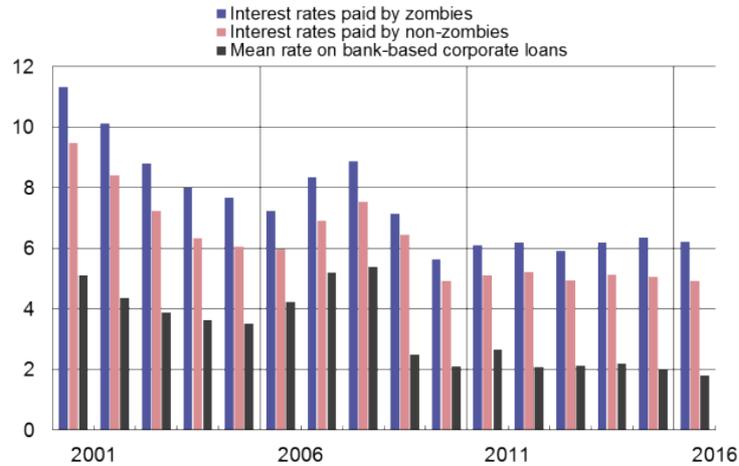


The overall interest rate path is also observable in the implicit rates paid by firms (interest expenditures relative to debt) which, at least when taken as averages, follow a logic similar to market rates, which may however soon be significantly higher^[7]. The interest rate margin between zombie firms and non-zombies seems to have remained constant in recent years, at approximately 1%. This margin is also similar across sectors, indicating that Finland will be spared from a phenomenon that plagued Japan in the 1990s, where banks subsidised at least a portion of zombie firms by granting them discounted rates on loans.

7. Interest expenditures and interest rates not only include bank loans but also all other debt instruments (bonds, trade credits, derivatives). Furthermore, interest expenditures and debt may not match, as interest expenditures are calculated on an annual basis and debt at year's end.

Chart 8.

Implicit interest rates by zombie characterisation (the figures represent the annual median of interest expenditures against debt)



Sources: Statistics Finland and Bank of Finland

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Weakly profitable firms who satisfy the zombie definition are heavily indebted – even up to five times more so – when measured up against other firms by inspecting value added. When adjusted against firms’ balance sheets, this disparity is much smaller, at approximately 50%. In any case, the interest rate path remains of particular concern to zombie firms. Not only may sudden rate hikes prove fatal for many zombie firms, but this would leave banks holding loan losses and nonperforming receivables.^[8] Another issue lies in the fact that zombies are somewhat overrepresented among large firms. In instances of ‘too big to fail’, a variety of non-performance related factors, such as regional politics or employment concerns, may determine the ultimate fate of zombies.

Conclusions

The outlook of the economy is evaluated all too often with crude instruments such as aggregate values and averages, while much which affects the health of the economy actually happens beneath the surface. The rise of weakly profitable firms is one such example, and might in the future lead to weaker productivity growth and various disturbances on the financial markets. Policymakers should therefore become increasingly vigilant regarding prolonged periods of weak corporate sector profitability. Our analysis raised government business subsidies as only one possible contributing factor, but others exist. These might include barriers to entry, cartels, deficiencies in the competitive tendering of public services and so forth. Other issues might be related to corporate taxation, whose impact may have been underestimated by focusing on localised deadweight losses instead of assessing their aggregate effects on the economy.

8. For risk estimates, see Storz, Manuela, Koetter, Michael, Setzer, Ralph & Westphal, Andreas (2017) ‘Do we want these two to tango? On zombie firms and stressed banks in Europe’, IWH Discussion Papers 13/2017.

Tags

firms, productivity, profitability

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The output gap has closed; Finland's economy at cyclical peak

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK



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Potential output is defined as the volume of GDP where all of the economy's factors of production are fully and efficiently utilised. Estimates show that Finland's output gap remained negative for nine consecutive years leading up to 2017, indicating that the country's volume of real GDP underperformed its potential during this period. The output gap has finally closed on the back of Finland's economic boom which is expected to last throughout 2018–2020. Over the medium term, however, potential growth is likely to remain considerably slower than before the financial crisis.



Potential growth rate weakened by recession

Growth in Finland's potential GDP volume is estimated by way of econometric analysis of the economy's supply-side factors. Calculating potential output in this manner makes use of what is known as an 'unobservable components model'^[1], an econometric framework where key macroeconomic variables, such as gross domestic product and unemployment, are decomposed into trend and cyclical components.

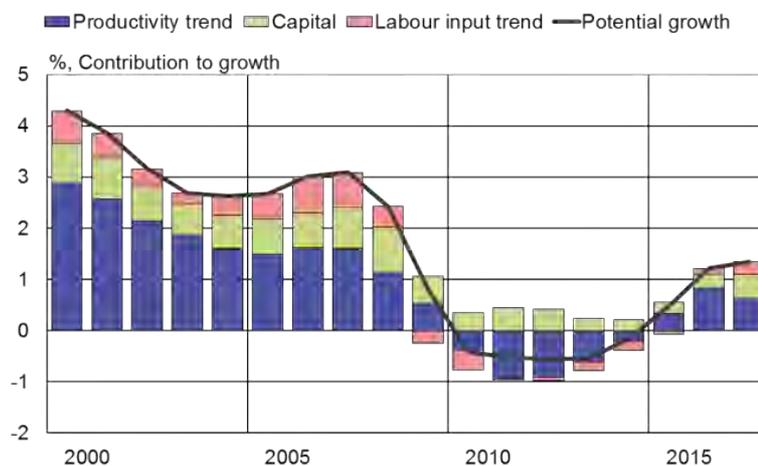
1. For a general overview of unobserved components models, see e.g.: Hamilton, J. (1994): Time Series Analysis. Princeton University Press, New Jersey; Andrieu, M: What Is In Your Output Gap? Unified Framework & Decomposition Into Observables. IMF Working paper WP /13/105, 2013; Durbin, J., Koopman, J: Time Series Analysis by State Space Methods. Oxford University, 2012.

The unobservable trend components^[2] of total factor productivity and factor inputs (i.e. labour and the capital stock) are inserted into a production function, which then provides a representation of potential output.^{[3], [4]}

While cyclical factors may well explain why economic growth has deviated from its trend, they alone do not account for the prolonged recession which followed the financial crisis. Moreover, Finland's long-term growth trend itself, i.e. the growth rate of potential output, ebbed considerably during the recession (Chart 1). Indeed, the prolonged economic slowdown seems to have eroded the economy's growth potential by impacting all of its supply factors, wherein the largest negative effect has resulted from weakened total factor productivity growth. While the potential growth rate has begun to strengthen in recent years, it still remains a far cry from its pre-crisis level.

Chart 1.

Finland's potential growth rate slowed during recession



Source: Calculations by the Bank of Finland.

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One advantage of using a production function to estimate potential output is that it can determine whether differential growth stems from productivity, labour or capital. Yet while helpful, this does not offer insight as to why total factor productivity growth has remained decidedly subdued.

2. The trend component is thought to represent each variable's prevailing level, or growth, when the economy is operating under normal conditions. In a one-sector model, a production function is used to combine the trend components of factor inputs into an estimate of potential output and its growth rate. Therefore, potential output growth is determined by growth in the labour and total factor productivity trends as well as growth in the capital stock.

3. Code written by Máté Tóthin (Mate.Toth@ecb.int) has been used in the calculation of potential output. Publication: Szörfi, B., Tóth, M. (2018): An Unobserved Components Model for Estimating Potential Output in the Euro Area (ECB, forthcoming). The model has been estimated using Bayesian methods.

4. The model makes use of the following univariate time series, either directly or by deriving parameters therefrom: real GDP, labour, hours worked, employment, capacity utilisation in manufacturing, working-age population (aged 15-74), total real capital stock, unemployment, labour-force share of the long-term unemployed (unemployed for over 12 months), underlying inflation (HICP excl. energy and food), wage and salary earnings index.

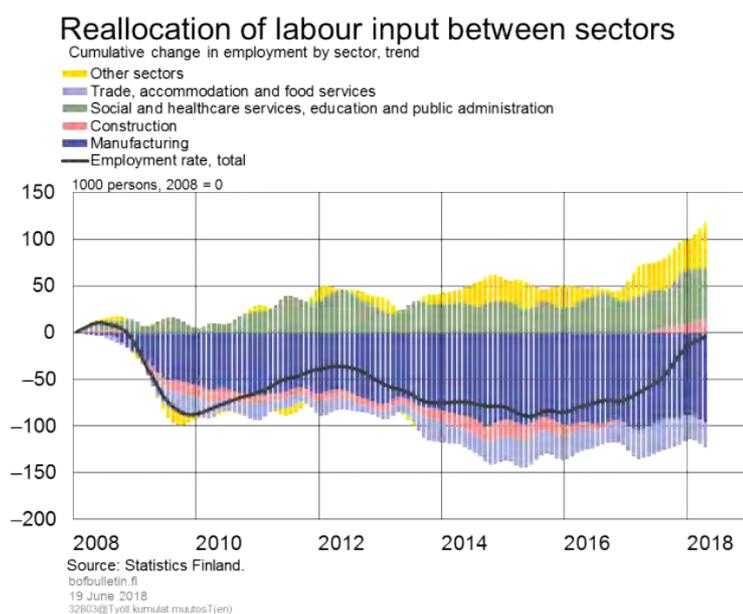
Slowdown in total factor productivity growth

In the early 2000s, potential output reached a peak growth rate of over 3% on the back of strong growth in total factor productivity. The opposite effect can be observed during the prolonged recession: at worst the decline in productivity contributed negatively to potential growth. While potential growth has gathered strength in recent years, it remains considerably below its peak.

Finland's economic growth has been hampered by the shrinking labour share in high-productivity manufacturing. Since 2008, manufacturing has lost almost 100,000 jobs. Together, manufacturing and trade^[5] have seen approximately 110,000 jobs disappear, although a similar amount has been added in other areas of the service sector (Chart 2).

Meanwhile, the highly productive ICT-sector's share of total output has declined sharply since the turn of the millennium. Electrical engineering and electronics accounted for 8% of Finland's GDP at its peak in the year 2000. By 2016, this figure had dropped to 3%, roughly equalling the primary sector (2.7%) in their respective shares of total output.

Chart 2.



According to Professor Matti Pohjola, the decline in total factor productivity can be observed in manufacturing as well as services, implying a trend whose effects cannot solely be attributed to changes within the economy's production structure. Discussion continues over what possible factors might have contributed to the stagnation in productivity growth^[6].

5. Trade also includes hospitality services.

6. According to Professor Pohjola, at least the following reasons have been proposed to explain the laggard productivity growth also seen in other countries: slowing scientific progress and technological change, obstacles to the spread of innovation, measurement errors, and various structural changes.

In times of severe economic crisis, firms may be tempted to cut back on research and development spending, weakening conditions for innovation and subsequently limiting potential for productivity growth. Indeed, investment into research and development^[7] seems to have diminished significantly in Finland: R&D expenditure stood at 5.2% of GDP in 2007–2010 but fell to 4.2% during 2015–2017. The export share of high technology exports has also shrunk.

An economy's aggregate productivity^[8] is also determined by the decomposition of firms who utilise its resources. Consequently, it can be misleading to evaluate productivity growth by simply inspecting the means of the economy's different sectors. Because the size and productivity distributions of firms are typically skewed, measures of central tendency will be especially influenced by values in the extrema (see Nurmi, Virén and Vanhala 2017, 2018).

At first glance, looking at figures representing the aggregate economy, it might seem that most Finnish firms are characterised by weak productivity. Instead, a closer analysis of different sectors reveals that highly productive firms have been able to maintain robust productivity growth throughout most of the 2000s, while a large share of firms have seen their productivity stagnate. This gap between firms who are growing and those who are not widened during the 2000s.^[9] A firm's productivity growth is not entirely dictated by its own success or failure to innovate outright but is also bolstered by the diffusion of innovations and technologies between companies. The growing lead of many frontrunner businesses might well suggest that meandering productivity growth is not so much an issue of a lack of ideas but is instead caused by the slow diffusion and uptake of new technologies.

In the low-end of the productivity spectrum, one especially troubling phenomenon can be found in the rise of so-called 'zombie firms' in the 2000s (see Nurmi, Virén and Vanhala 2018). Not only do these maladroit corporate entities display below-average productivity in and of themselves^[10], but they weaken growth conditions for other firms, increase barriers-to-entry, compromise the economy's ability to renew itself and dampen productivity growth.

International studies also demonstrate that total factor productivity growth may suffer if risk financing is no longer allocated towards high-risk but potentially high-reward projects as it once was.^[11]

7. Research and development investments are detailed in Statistic Finland's Quarterly National Accounts under the time series titled 'Cultivated assets and intellectual property products'.

8. According to Professor Maliranta (Innovointi ja luova tuho – erot maiden, toimialojen ja yritysryhmien välillä, Kansantaloudellinen aikakauskirja 1/2014, Finnish only), an economy's productivity growth is not only determined by technological change and economies of scale but also by the process of 'creative destruction' (the reallocation of inputs between firms) and the fact that the latter's impact is most significant in R&D-intensive fields.

9. Various estimates exist concerning the magnitude of this phenomenon. Staff turnover is generally higher among growth firms, so it is improbable that some firms should remain permanently more productive than others.

10. See e.g. Caballero et al 2008, Adalet McGowan et al 2017.

11. Benes, J., Clinton, K., Garcia-Saltos, R., Johnson, M., Laxton, D., Manchev P. ja Matheson T: Estimating Potential Output with a Multivariate Filter. IMF working paper WP/10/285, December 2010. What's the Damage? Medium-Term Output Dynamics after Financial Crises. IMF World Economic Outlook, October 2009, ch 4.

Growth of capital stock hindered by recession

Growth in the capital stock^[12] contributed favourably to the potential growth rate throughout 2000–2017, despite the subdued level of investment seen during the recession. The expansion of the economy's capital base has accounted for almost up to 1 percentage point of the potential growth rate. Changes in the capital base happen slowly, as new fixed capital investments are slightly offset by the rate of capital depreciation.

The capital stock's relative contribution to the potential growth rate did decline quite significantly during the recession. The increased uncertainty and weakening of corporate profitability which both followed the financial crisis do well to explain the low level of investment activity seen in Finland and the other advanced economies, in spite of accommodative financing conditions.^[13] Investments have since picked up after the recession, which in turn has strengthened the capital base (Chart 1).

According to Maliranta, Kuusi and Ali-Jyrkkö (2017)^[14], Finland's relative dearth of manufacturing investments is largely caused by subdued expectations concerning future productivity growth. That is to say, investment growth in Finland has not been hindered by a lack of finance.

Recessions can also restrict growth in the capital stock when failed businesses are left with previously implemented productive investments, effectively rendering productive capital obsolete. Indeed, the resolution of Finland's mobile phone industry and subsequent contraction of the entire electrical engineering and electronics industry is undoubtedly part of the reason for the capital base's weaker growth since 2011.

Labour input impacted by recession

The labour input's contribution to potential growth has been negative, albeit at a lesser degree than that of total factor productivity. During the recession, the decline in the labour trend weakened potential output. Quite recently, however, labour has once again started to support potential growth (Chart 3).

The aggregate contribution of the labour input^[15] can be decomposed into changes in population trend, participation rate, average hours worked and unemployment (NAWRU^[16]).

12. The capital stock denotes the real value of the economy's fixed assets, including public and housing investments.

13. Benes, J., Clinton, K., Garcia-Saltos, R., Johnson, M., Laxton, D., Manchev, P. and Matheson, T: Estimating Potential Output with a Multivariate Filter. IMF working paper WP/10/285, December 2010. What's the Damage? Medium-Term Output Dynamics after Financial Crises. IMF World Economic Outlook, October 2009, ch 4.

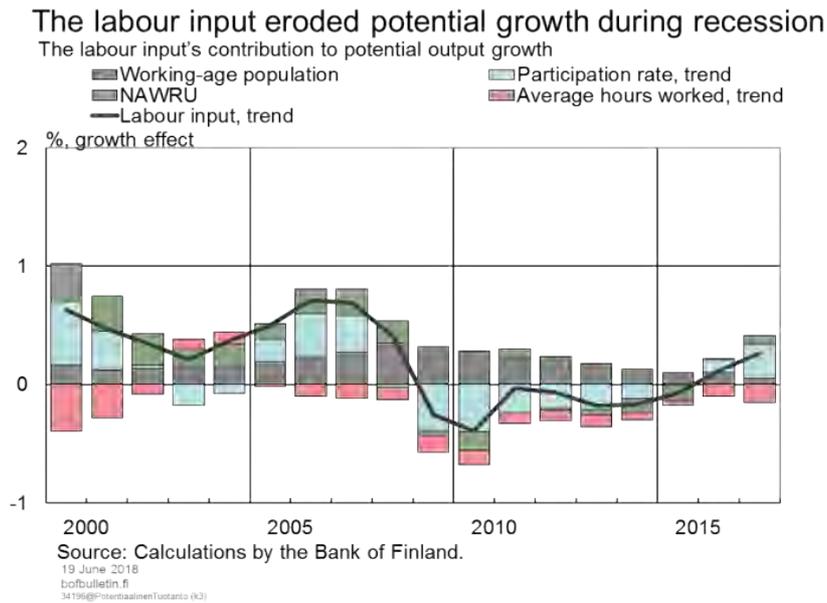
14. Ali-Yrkkö, Jyrki, Kuusi, Tero and Maliranta, Mika (2017): Why Have Business Investments Decreased? ETLA Reports 70.

15. The estimate is solely based on the volume, not quality, of labour.

16. Non-accelerating wage rate of unemployment. NAWRU is the rate of unemployment consistent with constant wage inflation.

Long-term trends can be identified in the performance of the labour input. The consistent decline in the average amount of hours worked per employee has reduced the potential growth rate. Meanwhile, the 15–74-year-old working-age population, i.e. the potential pool of labour, has expanded and contributed to the volume of potential output. The decline in the participation rate has especially weakened potential growth since 2008; contraction in the labour force is both a consequence of the economy's double-dip recession and a natural result of population ageing.

Chart 3.



Structural unemployment (NAWRU) has also increased slightly and weighed on the potential growth rate during the financial crisis (Chart 3). Finland's rate of structural unemployment is estimated to be large (see [Unemployment rate in Finland close to structural level](#)) A prolonged recession can result in the long-term displacement of portion of the labour force. Extensive periods of unemployment can erode workers' skills and turn cyclical unemployment into a more persistent variety, raising the NAWRU (hysteresis^[17]). Skills mismatch in the labour market or weakened incentives to work can also contribute to structural unemployment.

Potential output growth during 2018–2020

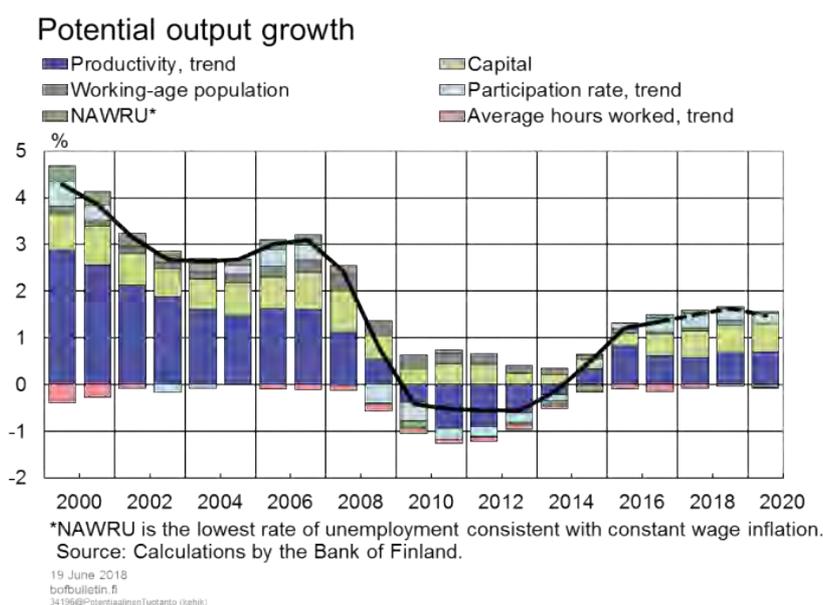
The estimate of potential output over the forecast period (2018–2020) is based on the same framework used to analyse Finland's production factors and calculate past potential growth.

17. Blanchard and Summers (1986) identified the phenomenon of hysteresis, where a rise in the unemployment rate may also increase structural unemployment. Blanchard, O., Summers, L: Hysteresis and the European Unemployment Problem. NBER Macroeconomics Annual 1986, Volume 1.

Finland's economy transitioned from recovery to peak

Finland's economy has transitioned from recovery to peak: GDP growth is forecast to surpass the potential growth rate over 2018–2020, and the volume of actual GDP will also exceed its potential.^[18] Potential growth is estimated to settle at approximately 1.5% during the forecast period, which ultimately means that it will remain slower than before the recession. In the immediate years ahead, potential output growth will be mainly supported by growth in the capital stock and total factor productivity (Chart 4).

Chart 4.



The Finnish economy has undergone strong cyclical fluctuations in the 2000s. A survey of the time period included in the forecast, i.e. 2000–2020, reveals that the business cycle began to strengthen in 2003 and peaked in 2007. During the onset of the global financial crisis, GDP collapsed and the output gap^[19] – the difference between GDP and potential output – recoiled sharply. Following this, the output gap remained negative for nine years all the way up to 2017. Should the pace of economic growth continue as **forecast**, the output gap will turn slightly positive and remain so throughout 2018–2020.

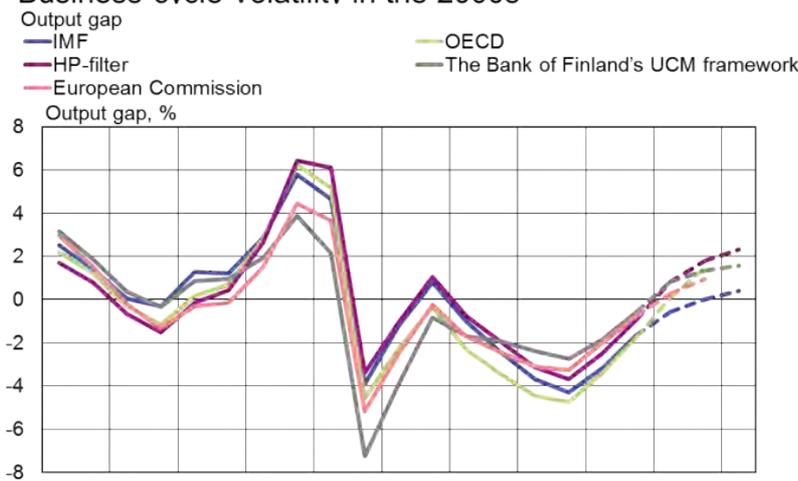
Chart 5 denotes various other institutions' estimates of Finland's output gap. Although there is consensus over the direction of the business cycle, the estimates of the output gap vary and especially so concerning recent years.

18. For the years 2018–2020, the unobserved components model relies on data from [The Bank of Finland's Economic Forecast](#).

19. The difference between real GDP and potential output is referred to as the output gap and is typically denoted as a percentage of potential output. A positive output gap cannot be sustained without inflationary pressures in wages and prices.

Chart 5.

Business-cycle volatility in the 2000s



A degree of uncertainty is inherent in estimates of potential output and the output gap. Because both of these variables are unobservable, they cannot be given precise values retroactively.^[20]

Potential output over the medium term

The potential growth rate will remain considerably slower than its pre-crisis level over the medium term during 2021–2025. Potential output will be mainly supported by growth in productivity and the capital stock (Chart 6). The labour input's contribution to potential growth looks to remain especially subdued. Prior to the financial crisis, labour^[21] contributed significantly to potential output growth. During 2012–2025, the continued decline in the working-age population and the reduction in average hours worked will both weaken the economy's potential growth. A rise in the participation rate will contribute to potential output. Consequently, the labour input will not contract in terms of total hours worked.

The medium-term estimate is based on the following assumptions: the rate of potential growth in 2025 represents the Bank of Finland's long-term estimate (); the working-age population will develop as according to Statistics Finland's Population projection over 2021–2025; average hours worked per employee will continue a slight downwards trend (0.1% per annum); the participation rate is forecast to strengthen to approximately 67.4% over 2021–2025^[22], when it is assumed that the participation rate for elderly

20. When reviewing econometric research results, it is important to be aware of the uncertainties that stem from a model's variables or specification, as economic models are always constructed on the basis of assumptions and arbitrary choices. Ambiguity in existing results are subject to increase if historic time series data are later revised.

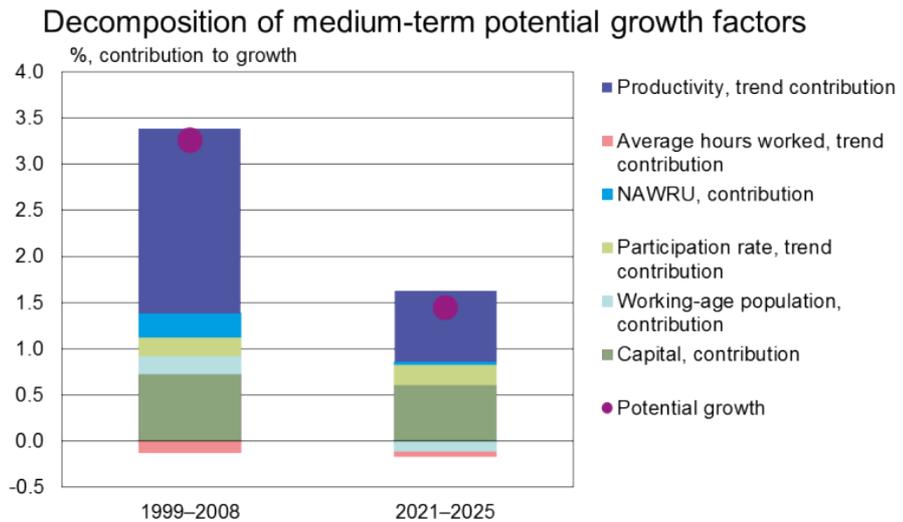
21. The estimate is solely based on the volume, not quality, of labour.

22. Before the financial crisis, the participation rate stood at approximately 66.5% over 1999–2008.

people will slightly improve and respective rate for younger people will return roughly to its pre-crisis level.

The rise in the participation rate might turn out to be weaker than forecast, in which case the labour input's contribution to potential growth could remain negative over the medium term. The development of the capital stock is based on the assumption of 'balanced growth', i.e. growth in the capital base is determined by labour and productivity growth. Indeed, productivity growth should be viewed as a pressure gauge of sorts, which denotes the level of total factor productivity needed by 2025 to reach the long-term growth forecast for that very year.

Chart 6.



Source: Calculations by the Bank of Finland.

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Tags

forecast, gross domestic product, medium term, output gap, potential output

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Bank of Finland staff forecasts: an evaluation

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK



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Monetary policy decisions are based on assessment of the current and future state of the economy. In order to obtain forecasts, central banks build models, which are simplified representations of the complex interactions among macroeconomic variables. The Bank of Finland regularly publishes its forecasts, using a large set of data regarding current economic developments. Analysis of this large set of data includes the use of formal macroeconomic models, which are also employed to make projections for the future course of the economy. These projections represent the most likely values for the main macroeconomic variables of the Finnish economy.



This article documents the performance of Bank of Finland forecasts for GDP, inflation, unemployment and the components of GDP over the years 2004–2017. This period has been particularly challenging for forecasting. The financial crisis originating in the United States in 2007 spread globally. As a consequence Finland, as well as many other countries, experienced a severe contraction in output and a slow recovery. New policy measures were implemented in response to the crisis, and their effects on the economy were highly uncertain and difficult to anticipate.

Macroeconomic models and their ability to predict developments in the economy were called into question, as the models used for forecasting by Central Banks failed to predict

the extent and duration of the crisis as well as the subsequent slow recovery. This led many monetary authorities to revise their models in order to incorporate more detailed description of the financial sector. In fact, recent analysis conducted at the Federal Reserve and European Central Bank suggests that models which include a richer set of financial variables would have been more successful in predicting the sharp decline of output in 2009 and the subsequent slow recovery.^[1]

The Bank of Finland's main forecasting model, named AINO 2.0, is a stylized representation of the Finnish economy and describes complex relationships across a wide range of macroeconomic variables. The model was first used for the production of forecasts in 2004 and was updated in 2009 and again in 2015. The latest update was motivated by the need to explicitly model the banking sector and its interaction with the real sector subsequent to the financial crisis.^[2]

A previous evaluation of the Bank of Finland forecasts was conducted in 2011, shortly after the second update of the model, over a rather short sample spanning 2004–2010.^[3] With an additional 7 years of data we are in a better position to examine the performance of the Bank of Finland staff forecasts using the latest vintage of the model.

The Bank's Monetary Policy and Research department produces forecasts twice a year, in June and December, for the current calendar year and the following two years. The forecasts are produced in conjunction with the Broad Macroeconomic Projection Exercise of the European System of Central Banks.

The forecasts are generated on the basis of the latest quarterly national accounts data and a set of assumptions regarding external developments, such as the future paths of exchange rates, foreign demand, oil and raw material prices plus market expectations of short-term interest rates.^[4] Expert judgement on current economic conditions and likely future shocks hitting the economy are also incorporated as assumptions in the model. Judgement regarding current economic conditions reflects the information that can be obtained from the most recent short-term indicators but is not yet incorporated into the quarterly national accounts. In fact, statistical agencies release data pertaining to a month or quarter with delays. For example, GDP quarterly numbers are made available only two months after the reference quarter; e.g. the 2018Q1 first release of GDP was published at the end of May 2018. To overcome this issue, the Bank of Finland uses a set of nowcasting models [see also <https://www.suomenpankki.fi/en/research/forecasting-models/>]. Judgement regarding the future course of the economy reflects anticipated or highly likely events that are not explicitly modelled in AINO 2.0 but can significantly, if only temporarily affect aggregate demand or production, such as changes in fiscal policies, persistent sectoral shifts in allocation of the economy's resources, or changes in the Finnish export shares on world markets.

1. See Cai et al. (2018) and Lindé et al. (2016).

2. Kilponen, Orjasniemi, Ripatti and Verona (2016) provide a detailed description of the latest version of the AINO model.

3. See Newby and Orjasniemi (2011).

4. The appropriateness of these assumptions might affect the accuracy of the forecasts. However, in this analysis we are not conducting a systematic evaluation of the impact of the external assumptions on the accuracy of the forecasts.

Another challenge to forecasting is that the data are subject to revision: e.g. Statistics Finland publishes revised values for past months or quarters. Each of these revised values is called a vintage. Some variables (e.g. GDP, exports and imports) are subject to larger revisions than others (e.g. HICP). In this evaluation exercise, forecasts are compared with the latest vintage available at the time the evaluation was made, i.e. the numbers published by Statistics Finland in March 2018. The final release of data should represent the 'true' value of the series.

Accuracy and unbiasedness of the forecasts

The forecasts are evaluated for accuracy and lack of bias, which are computed from the forecast errors, i.e. the difference between the realized final values and the real time forecast. To measure bias we use the Mean Error (ME), simply the average of the forecast errors over the evaluation sample. If the forecast errors are on average close to zero, then the forecasts are said to be unbiased. This is a desirable property because it implies that the forecasters are not repeating the same mistake systematically. However, if the forecasts are consistently below (or above) the realizations, then the forecasts are negatively (or positively) biased. Note that an ME close to zero is also consistent with large forecast errors, as long as they are opposite in sign, so this statistic is not enough to judge the performance of the forecast. For this reason, we also compute three forecast accuracy measures: the Mean Absolute Error (MAE), the Root Mean Squared Forecast Error (RMSFE) and the Mean Change of Direction (MCD). As the names suggest, the MAE is the simple average of the absolute value of the forecast errors and the Root Mean Squared Forecast Error (RMSFE) is the squared root of the average of the squared forecast errors. The smaller the MAE or the RMSFE, the closer the forecasts are to the actual values, and therefore the more accurate they are. Both these measures of accuracy give equal weight to positive and negative errors of the same size, but the RMSFE penalizes errors of large magnitude more than the MAE does. The MCD is defined as the proportion of times a drop or increase in the series was correctly predicted. Trivially, more accurate forecasts translate into a higher MCD, with a maximum value of 100%. This statistic rewards correct predictions of the sign of the change in the series without giving consideration to the magnitude of the forecast error.

Figures 1 through 3 plot the variables^[5] along with the forecasts for the current year and up to two years ahead. We distinguish between forecasts produced in June (in blue) and in December (in green). To highlight the importance of data revisions we also show the range of values taken by the variables throughout the different vintages (shaded gray area).

For most of the evaluation sample, GDP growth remained well below the 4% average registered in the previous decade, reaching a drop of about 8% in 2009. Although it experienced a quick rebound, output displayed another fall, less marked but more prolonged, in 2012–2014. Over these years the forecasts consistently predicted a much swifter recovery. In retrospect, this reflected the difficulty of the model and the

5. For each year t , output growth and its components, as well as inflation are defined as: $(x_t^{Q1} + x_t^{Q2} + x_t^{Q3} + x_t^{Q4}) / (x_{t-1}^{Q1} + x_{t-1}^{Q2} + x_{t-1}^{Q3} + x_{t-1}^{Q4})$ with x_t^{Qj} the level of the series in quarter j of year t . Unemployment is the average of the monthly rates.

economists to acknowledge a prolonged slowdown of productivity growth which was associated to the structural weakness of the Finnish economy and the loss of export market shares. Growth was more robust again in 2016–2017, and there the forecasts were less biased and more accurate.

The behaviour of the HICP resembles that observed in other euro area countries and exhibits the so-called twin puzzle: missing deflation in years 2009–2011, when inflation was around or even above target despite the prolonged and severe recession; missing inflation in years 2014–2017, when inflation was expected to rise thanks to the ongoing recovery. Despite these baffling developments in HICP inflation, the Bank's forecasts tracked the inflation series quite closely, except for years 2011–2012 and 2015–2016, when the model predicted inflation would quickly revert to target, as output was also expected to grow faster. The puzzling behaviour of inflation can partially be explained by unexpected shocks in oil prices, which surged in 2011–2012 during the Arab Spring, only to plummet in 2014–2015.

The unemployment rate was steadily declining in the decade preceding the crisis and suddenly grew in 2009 as the recession hit the economy. Although the Bank of Finland correctly forecast a rise in the rate, it substantially over-predicted the size of the increase. This is because the Bank expected unemployment to behave in a similar fashion as in the crisis of the early 1990s, during which it increased swiftly, reaching a peak of almost 18%. In 2012–2015 unemployment rose further, mirroring the decline in output. Note that during the same period the Bank was instead optimistic, predicting a decline in the unemployment rate, consistent with the (optimistically) expected recovery in output and increase in the inflation rate.^[6]

Revisions in GDP have been quite substantial relative to inflation and unemployment. The largest downward revision occurred in 2006 and amounted to 1.45%, while the following year registered the largest upward revision (0.92%). For the unemployment rate, the only significant revisions were made for the 2013 value, which was initially revised upward by 0.3% and subsequently revised downward by the same amount. Revisions to inflation are negligible (up to 0.02%).

The descriptive statistics summarizing the evaluation results for GDP, inflation and unemployment are presented in Table 1.

In general, forecasts produced in December are less biased and more accurate than those produced in June, reflecting the larger data set available at the time the forecasts are made, such as a new release of National Accounts by Statistics Finland for quarterly GDP and new releases of monthly HICP, unemployment figures and short-term indicators. This finding is also clearly seen in Charts 1 through 3, in which the green lines are closer to the actual data than the blue lines.

Forecasts for GDP are overall negatively biased, i.e. the forecasts systematically over-predict output growth during the sample, and the bias increases (in absolute value) with the forecast horizon. The forecasts errors are usually negative (positive), i.e. we tend to

6. Note that the unemployment rate is not part of the core theoretical model; it is forecast using a simple empirical model with feedback from the core model's labour market variables such as total hours worked.

over-predict (under-predict) GDP growth, when GDP growth is below (above) the mean. This reflects, in general, the model's tendency to converge towards its historical mean rates too fast.

Note that over the evaluation sample, output fell drastically in 2009 and fell again substantially in 2012–2013. In these years we observe by far the largest, negative forecast errors. For example, in 2007 the Bank of Finland forecast that output would grow by 2.5% in 2009, while it fell by 8%, resulting in a forecast error of -10.5. Removing 2009 from the evaluation substantially improves the bias, which reduces to -0.05 for current year and 0.08 and -0.12 for one and two years ahead, respectively.

Both inflation and unemployment display a much smaller bias.^[7] For inflation it is generally positive and larger at one and two year horizons. This is due to an over-prediction of the model, which forecasts that within about two years HICP inflation will return to target, i.e. close to but under 2%.

The bias for unemployment is positive at two years ahead and negative for shorter horizons. From Chart 3 it is clear that by far the largest forecast errors were made for the years 2009–2011. Because the errors were opposite in sign, e.g. 2.8% for 2010 and -3% for 2011 for the two years ahead horizon, they each other cancel out, and the resulting bias is therefore small.

In terms of forecasting performance for all variables and measures considered, accuracy deteriorates with the forecasting horizon. Forecasts are more accurate in December than in June. Output records the highest MAE and RMSFE, but their values are, again, reduced considerably if we exclude 2009 from our evaluation sample, dropping by about 40% for one-step-ahead and two-step-ahead predictions.

The results for the components of GDP are reported in Table 2. Imports, exports and private investment prove difficult to forecast, as they exhibit large bias and RMSFEs. The model tends to under-predict these components in the current year and over-predict two years ahead. However if we focus on the MCD, then the forecasting performance is comparable with the other components of GDP. Also, the large RMSFE associated with the exports, imports and investment series reflect the high volatility and large revisions of these variables. To appreciate the high volatility of the series, note that, when we scale the RMSFE by the standard deviation of the series computed over the evaluation sample, we obtained ratios that are close to those of the other variables. Finally, the bias and accuracy of the forecasts on import and exports crucially depend on the appropriateness of the assumptions regarding future developments in the exchange rate and foreign demand. For example, the large positive bias in the export forecasts for current year forecasts and the large negative bias for one and two years ahead mirror the large bias in the forecasts for external demand (the bias in external demand can amount up to 90% of the bias in exports). Similarly, the RMSFE for exports is comparable in magnitude to the RMSFE of external demand for all forecast horizons.

7. Because of the small size of our sample, we did not conduct any formal forecast evaluation test for the bias or relative forecast accuracy, as the results from these tests would be unreliable.

Forecast performance relative to benchmarks

Rather than focusing exclusively on absolute performance, it can be informative to also comment on the relative forecasting performance of the AINO model compared with simple benchmarks. To this end, the accuracy of the Banks' forecasts is compared against the accuracy of three alternative forecasts: the real time mean, an autoregressive model of order one and forecasts produced by the Ministry of Finance. To measure relative forecast accuracy, we compute the relative mean squared error, defined as the ratio between the RMSFE from the Banks' forecasts and the RMSFE from one of the alternative forecasts. A value lower (higher) than one indicates a better (worse) performance of the forecasts from the Bank of Finland's model. Our results are reported in Table 3.

The real time mean is computed for every date in our sample as the average taken by the series of the previous eight years. This moving average, which discards values further back in time, is well suited to account for the turbulent economic conditions of our evaluation sample. For all variables and all forecast horizons, the Banks' forecasts are more accurate than the mean, although the relative RMSFE approaches one as the forecast horizon increases. This suggests that at longer horizons the forecasts from the AINO model converge to the real time mean of the series.

The autoregressive model of order one uses the most recent value to forecast future values. This simple model has been found to be a very competitive benchmark (Chauvet and Piger 2012). Generally, the AINO forecasts are more accurate than the forecasts from the autoregressive model, although gains are smaller than over the real time mean and tend to dissipate for forecasts for two years ahead.

The performance of the Bank's forecasts and Ministry of Finance forecasts are quite comparable.^[8] Occasional differences can be attributed to outliers which greatly affect the RMSFE in such a small evaluation sample. For example, for unemployment, the Bank's forecasts appear more accurate than the Ministry of Finance forecasts for the current year. However, for two years ahead the Ministry of Finance forecasts display a somewhat lower RMSFE. It turns out that this last result is driven by the forecast of the 2015 unemployment rate made in December 2013, when the Bank was optimistic about the recovery of the labour market. For output, the performance is quite comparable, except for the June forecasts made for the current year. For this case the Ministry of Finance produced more accurate forecasts overall and the Bank made a larger forecast error in 2012, as it did not foresee the double-dip recession. The Bank's forecasts seem to be more accurate at all horizons for inflation. Note that while the Bank of Finland forecasts HICP inflation, the Ministry of Finance focuses on CPI inflation. These two series overlap for most of the sample, except in 2009, when CPI dropped to zero, while HICP remained closer to target (1.63%).

8. The Ministry of Finance did not publish its forecasts in December 2007 and started to publish forecasts for two years ahead only in December 2009. To construct the relative RMSFE we recomputed the RMSFE for the Bank's forecasts over the overlapping sample of observations.

General equilibrium models have benefits that go well beyond forecast accuracy

We have documented the performance of the Bank of Finland forecasts over a turbulent period of time characterized by large and abrupt changes in the economic and policy environment. In general, the forecasts display small bias and good accuracy. However, sizable data revisions and large volatility can negatively impact bias and accuracy for some series. Furthermore, the properties of the forecasts depend on the appropriateness of expert judgement and assumptions on the international economy, which are external to the model. The Bank's forecasts compare well with those from simple but competitive benchmark models as well as with those produced by external institutions. Still, the short sample makes some of our results sensitive to outliers and does not allow for rigorous statistical testing on the measures of bias and accuracy used. Regardless, employing a general equilibrium model to produce forecasts provides benefits that go beyond forecast accuracy, such as internal consistency and the ability to provide a structural interpretation for the forecast, benefits which are not easily attainable with simple univariate models. Both properties derive from the fact that the AINO model's economic relations among macro-variables are largely derived from modern macroeconomic theory. Forecast values for different macroeconomic variables are then internally consistent because they satisfy these relations.^[9] For similar reasons, models like AINO can be viewed as devices useful for storytelling as they can inform policymakers about future developments taking into account complex interactions of agents in the economy as well as future policy decisions.

References

- Cai, M. – Del Negro, M. – Giannoni, M.P. – Gupta, A. – Li, P – Moszkowski, E. (2018) 'DSGE Forecasts of the Lost Recovery', NYFED wp. 844.
- Chauvet, M. – Potter, S. (2012) 'Forecasting Output', in Handbook of Economic Forecasting, Volume 2, Elsevier.
- Kilponen, J. – Orjasniemi, S. – Ripatti, A. – Verona, F. (2016) The Aino 2.0 model, Research Discussion Papers 16/2016, Bank of Finland.
- Linde, J. – Smets, F. – Wouters, R. (2016) Challenges for Central Banks' Macro Models, Working Paper Series 323, Sveriges Riksbank.
- Newby, E. – Orjasniemi, S. (2011), 'Bank of Finland's forecast errors in 2004–2010', Bank of Finland Bulletin 3/2011.

9. One example of these relations is the Phillips curve. Then, based on this relationship between inflation and economic activity, the model would predict an increase in inflation associated with an increase in demand and positive output growth.

Chart 1.

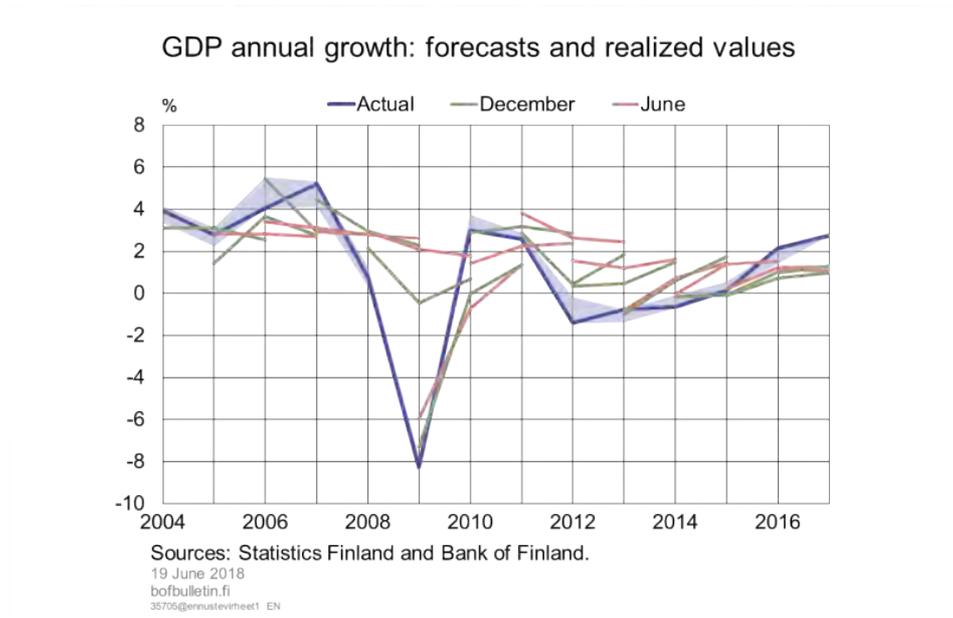


Chart 2.

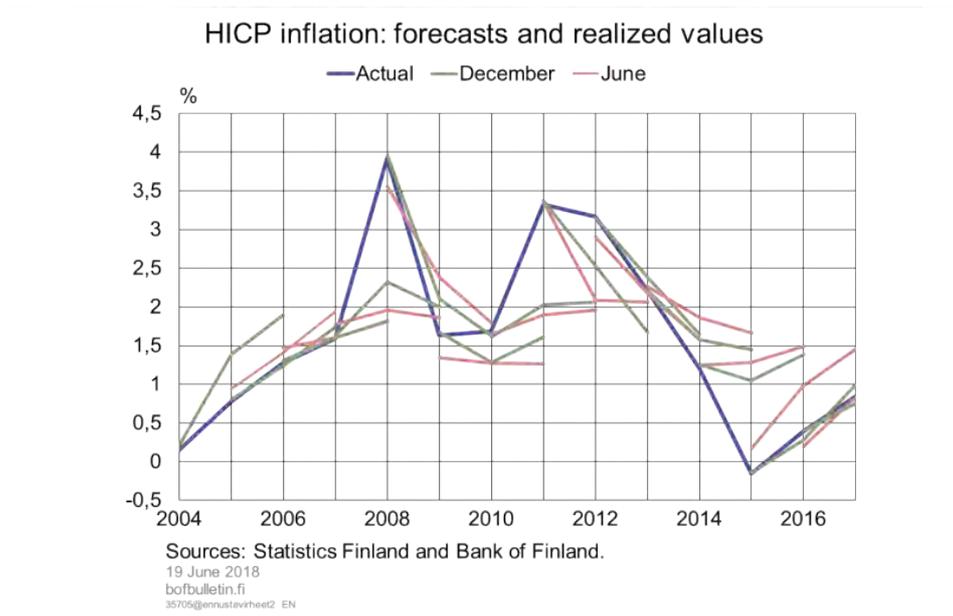


Chart 3.

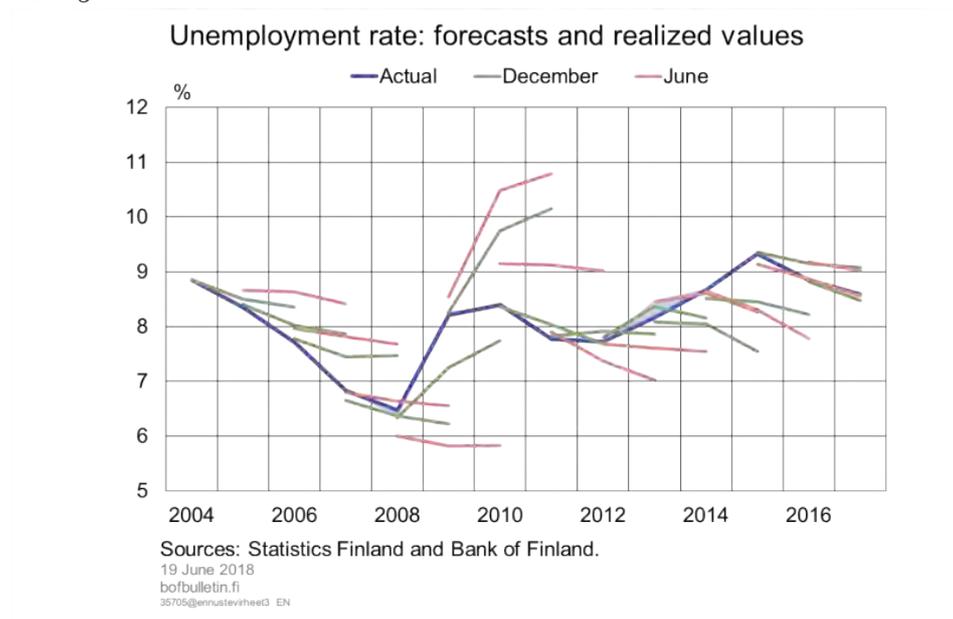


Table 1.

Bias and accuracy for GDP growth, HICP and unemployment, 2004–2017

| | GDP | | | HICP | | | Unemployment rate | | |
|----------------------------|-------|-------|---------|------|-------|---------|-------------------|-------|---------|
| | June | Dec | overall | June | Dec | overall | June | Dec | overall |
| <i>ME current</i> | -0.25 | -0.14 | -0.19 | 0.02 | -0.02 | 0.00 | -0.12 | 0.02 | -0.05 |
| <i>ME 1 year ahead</i> | -0.92 | -0.50 | -0.71 | 0.12 | 0.10 | 0.11 | -0.13 | -0.06 | -0.09 |
| <i>ME 2 years ahead</i> | -1.49 | -1.07 | -1.28 | 0.09 | 0.10 | 0.09 | 0.14 | 0.03 | 0.08 |
| <i>MAE current</i> | 1.20 | 0.81 | 1.00 | 0.17 | 0.03 | 0.10 | 0.24 | 0.07 | 0.16 |
| <i>MAE 1 year ahead</i> | 2.58 | 1.85 | 2.20 | 0.71 | 0.54 | 0.62 | 0.86 | 0.47 | 0.66 |
| <i>MAE 2 years ahead</i> | 2.78 | 2.80 | 2.79 | 0.92 | 0.82 | 0.87 | 1.43 | 0.95 | 1.19 |
| <i>RMSFE current</i> | 1.53 | 0.96 | 1.27 | 0.20 | 0.04 | 0.14 | 0.32 | 0.08 | 0.23 |
| <i>RMSFE 1 year ahead</i> | 3.64 | 2.65 | 3.16 | 0.94 | 0.73 | 0.84 | 1.13 | 0.60 | 0.91 |
| <i>RMSFE 2 years ahead</i> | 3.89 | 3.73 | 3.81 | 1.18 | 1.05 | 1.11 | 1.62 | 1.18 | 1.42 |
| <i>MCD current</i> | 0.67 | 0.85 | 0.76 | 1.00 | 0.92 | 0.96 | 0.92 | 1.00 | 0.96 |
| <i>MCD 1 year ahead</i> | 0.36 | 0.67 | 0.52 | 0.45 | 0.67 | 0.56 | 0.64 | 0.83 | 0.73 |
| <i>MCD 2 years ahead</i> | 0.40 | 0.27 | 0.34 | 0.10 | 0.36 | 0.23 | 0.50 | 0.55 | 0.52 |

| | | | | | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE</i> | 0.45 | 0.28 | 0.37 | 0.17 | 0.03 | 0.12 | 0.40 | 0.11 | 0.29 |
| <i>current</i> | | | | | | | | | |
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE 1</i> | 1.04 | 0.75 | 0.90 | 0.77 | 0.60 | 0.69 | 1.38 | 0.73 | 1.09 |
| <i>year</i> | | | | | | | | | |
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE 2</i> | 1.11 | 1.06 | 1.08 | 0.97 | 0.86 | 0.92 | 1.98 | 1.44 | 1.72 |
| <i>years</i> | | | | | | | | | |

Table 2.

Bias and accuracy for components of GDP, 2004–2017

| | IMPORTS | | | EXPORTS | | | OV. CONSUMPTION | | |
|----------------------------|---------|-------|---------|---------|-------|---------|-----------------|-------|---------|
| | June | Dec | overall | June | Dec | overall | June | Dec | overall |
| <i>ME current</i> | 1.60 | 4.41 | 3.06 | 0.87 | 2.05 | 1.54 | -0.13 | 0.26 | 0.08 |
| <i>ME 1 year ahead</i> | -0.83 | 0.56 | -0.11 | -1.67 | -0.55 | -1.09 | -0.03 | 0.04 | 0.01 |
| <i>ME 2 years ahead</i> | -2.59 | -1.89 | -2.22 | -3.54 | -2.51 | -3.00 | -0.26 | -0.09 | -0.17 |
| <i>RMSFE current</i> | 2.74 | 5.48 | 4.38 | 3.25 | 3.44 | 3.41 | 0.97 | 0.56 | 0.78 |
| <i>RMSFE 1 year ahead</i> | 7.82 | 5.53 | 6.73 | 8.66 | 5.81 | 7.31 | 0.84 | 0.72 | 0.78 |
| <i>RMSFE 2 years ahead</i> | 7.43 | 7.00 | 7.21 | 8.59 | 8.22 | 8.40 | 1.04 | 0.80 | 0.92 |
| <i>MCD current</i> | 0.58 | 0.54 | 0.56 | 0.75 | 0.69 | 0.72 | 0.50 | 0.69 | 0.60 |
| <i>MCD 1 year ahead</i> | 0.64 | 0.58 | 0.61 | 0.45 | 0.58 | 0.52 | 0.55 | 0.75 | 0.65 |
| <i>MCD 2 years ahead</i> | 0.70 | 0.45 | 0.58 | 0.40 | 0.45 | 0.43 | 0.40 | 0.73 | 0.56 |
| <i>Rel RMSFE current</i> | 0.40 | 0.79 | 0.63 | 0.42 | 0.44 | 0.43 | 1.20 | 0.69 | 0.97 |
| <i>Rel RMSFE 1 year</i> | 1.15 | 0.82 | 0.99 | 1.08 | 0.72 | 0.91 | 1.08 | 0.93 | 1.00 |

| | | | | | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE</i> | 0.52 | 0.43 | 0.48 | 0.52 | 0.60 | 0.56 | 0.96 | 0.78 | 0.87 |
| <i>current</i> | | | | | | | | | |
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE 1</i> | 1.21 | 0.80 | 1.02 | 1.02 | 0.89 | 0.95 | 1.23 | 1.09 | 1.16 |
| <i>year</i> | | | | | | | | | |
| <i>Rel</i> | | | | | | | | | |
| <i>RMSFE</i> | 1.11 | 1.08 | 1.09 | 1.07 | 1.06 | 1.07 | 1.14 | 1.22 | 1.18 |
| <i>2 years</i> | | | | | | | | | |
| <i>ahead</i> | | | | | | | | | |

Table 3.

Relative forecasting performance for GDP growth, HICP and unemployment, 2004–2017

| | GDP | | | | | | HICP | | | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| | Mean | | AR | | MoF | | Mean | | AR | | MoF | |
| | June | Dec |
| <i>current year</i> | 0.42 | 0.28 | 0.45 | 0.29 | 1.19 | 1.08 | 0.15 | 0.03 | 0.20 | 0.04 | 0.92 | 0.56 |
| <i>one year ahead</i> | 0.93 | 0.70 | 0.99 | 0.75 | 1.00 | 1.02 | 0.66 | 0.53 | 0.80 | 0.63 | 0.74 | 0.72 |
| <i>two years ahead</i> | 0.96 | 0.97 | 1.05 | 1.04 | 0.93 | 1.05 | 0.82 | 0.75 | 0.95 | 0.88 | 0.79 | 0.86 |
| UNEM | | | | | | | | | | | | |
| | Mean | | AR | | MoF | | | | | | | |
| | June | Dec | June | Dec | June | Dec | | | | | | |
| | June | Dec | June | Dec | June | Dec | | | | | | |
| <i>current year</i> | 0.23 | 0.06 | 0.50 | 0.14 | 0.78 | 0.59 | | | | | | |
| <i>one year ahead</i> | 0.73 | 0.36 | 1.25 | 0.69 | 1.17 | 0.85 | | | | | | |
| <i>two years ahead</i> | 0.98 | 0.63 | 1.70 | 1.25 | 1.10 | 1.35 | | | | | | |

Tags

forecast error, gross domestic product, inflation, revisions, unemployment

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Finland's long-term growth prospects moderate

TODAY 12:30 PM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK



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Senior Adviser

The protraction of the recession following the financial crisis weakened Finland's growth potential, while population ageing and the accumulation of public debt continue to weigh on growth prospects. In spite of the economy's recent recovery, long-term growth is expected to remain below its pre-crisis level, averaging 1.5% per annum over 2026–2040.



The Finnish economy returned to growth in 2015 after a period of prolonged recession, buoyed by favourable cyclical conditions in the world economy and backed by monetary policy. However, economic growth is in the long term ultimately determined by the economy's supply factors, not demand, and is contingent on underlying trends in labour and labour productivity.

During the recession, the labour supply shrank, private sector investment was persistently subdued, and businesses reduced their spending on research and development. The economy also underwent a shift in its supply structure: by 2017, the manufacturing sector had shed 100,000 jobs compared with 2008. In addition, ICT's proportionate share of the economy's total output seems to have permanently contracted, where the sector was once a main source of productivity growth before the recession.

Long-term growth forecast: growth conditions ebbed by recession

This article presents the Bank of Finland's long-term growth forecast for the years 2026–2040. The forecast is based on a growth-accounting framework, which is used to estimate the economy's potential (real GDP) growth rate over the forecast horizon. Projections of the economy's main supply factors – labour, capital and total factor productivity – are primarily based on their past trends. The long-term growth forecast serves as an extension of Finland's medium-term potential growth outlook for 2018–2025, as presented in the corresponding [article](#).

The Bank of Finland last assessed the economy's long-term growth prospects in 2015.^[1] Already then, the growth rate for the decades ahead was projected to be slower than historical growth, and annualised average growth over the 2020s was forecast at 1.3%. Population ageing, the gradual shift into a service economy, and the worldwide slowdown in productivity growth were all deemed to cast a shadow over long-term growth. In the current forecast, these phenomena are still seen to weigh on the long-term growth potential of the Finnish economy.

In the model framework used to project long-term growth, the economy is divided into three sectors: general government, manufacturing industry and private economic activities other than manufacturing. Strictly speaking, the last sector includes property ownership and renting, but these have been exempted from analysis. Each individual sector is assessed in terms of its projected growth in labour, the capital stock and total factor productivity. The resulting estimates are inserted into a production function, which subsequently provides a representation of potential output for each sector. Finally, the output of all three sectors are combined to represent the output of the whole economy.

The framework is used to produce a baseline forecast. This is supplemented by a sensitivity analysis of two alternative growth paths based on stronger and weaker projected trends in the labour input and, respectively, public sector labour requirements.

Population ageing's squeeze on labour supply beginning to ease

The forecast of the labour input is based on projected trends in the labour force (age groups 15-74), the participation rate, the employment rate and the number of hours worked per employee. The estimate of the labour force has drawn on Statistics Finland's most recent population projection, published in 2015.^[2] The participation rate has been estimated by decomposing the labour force into cohort-specific shares and projecting prior trends into the future. The employment rate is based on the Bank of Finland's

1. A Finnish-language update on the previous long-term forecast is found in the article: Mäki-Fränti (2015): "Rakenteelliset tekijät hidastavat pitkän aikavälin talouskasvua", *Kansantaloudellinen aikakauskirja* 3/2015.

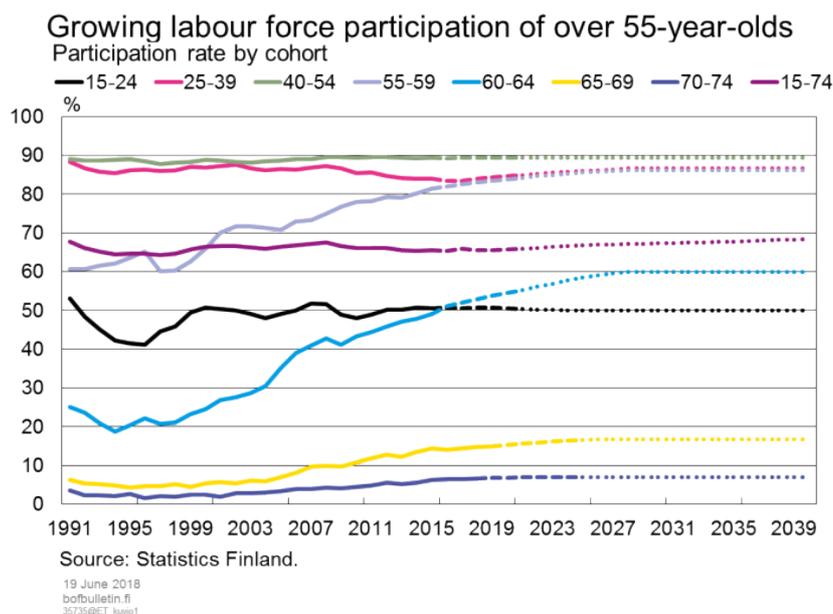
2. Statistics Finland's projection concerning population growth may yet prove to be overly optimistic, as the birth rate has underperformed estimates. Their next population projection is due for publication in November 2018.

estimate of structural unemployment in the long term. The number of hours worked per employee is similarly based on past performance.

According to the population projection, the number of 15-74 year-olds will reduce by slightly less than 30,000 persons during 2026–2040. The participation rate within the labour force is projected to stand at approximately 67% in 2026. Thus, the participation rate is expected to rise at a considerable pace at the start of the long-term forecast period. This can largely be attributed to the increased participation of over 55-year-olds, whose ubiquity in the labour force is expected to continue its long-standing growth.

In the framework, cohort-specific participation rates are held constant after the year 2026, such that changes in the participation rate during the forecast period are solely caused by shifts in the population structure. Therefore, while the participation will reach over 68% by 2040, it will be on the back of demographic transition. 40 to 50-year-olds, who have the highest cohort-specific participation rate, will see their presence in the labour force grow, while that of over 60-year-olds, whose respective participation rate is below-average, will decline.

Chart 1.



The growth in the participation rate will offset the decline in the working-age population, inasmuch that the labour force will grow by approximately 40,000 persons during the forecast period. Further gains in the labour force are quite plausible, should the participation rates of over 55-year-olds continue to grow – the effects of which are outlined in an alternative scenario.

The employment projection is based on historical trends in structural unemployment. Structural unemployment is expected to remain at 7.7% which is also its projection over the medium term.

The number of hours worked per employee reduced notably from the 1990s into the early 2000s. In recent years, however, this trend has flattened out and even turned towards

slight growth, owing both to an increase in hours worked by those in full-time employment as well as sustained growth in part-time employment. It is assumed that in the long term part-time work will become increasingly common; hence, hours worked per employee are projected to increase slightly, at approximately 0.2% per annum.^[3]

Overall, the entire labour input, as measured by total hours worked, is expected to decline by approximately 1.4% over the forecast period. Calculations pertaining to the forecast of the labour input ignore potential changes in the qualitative aspects of labour, as such changes influence productivity and are therefore given their due in the forecast of total factor productivity.

Potential growth is not only influenced by the available labour but also by its distribution among the economy's three sectors. Labour resources are allocated such that the public sector's labour requirements are determined exogenously through the demand for age-related public and publicly-funded services as well as the level of productivity growth in the public sector. The economy's private sectors, i.e. manufacturing and other private production, share the remainder of the labour force according to the sectors' size, measured by labour resources required.

Productivity growth has traditionally been slow in the public sector and nor is its growth rate expected to markedly improve in the near future, so rising demand for age-related services is intimately linked with growth in age-related public expenditure.

Projections concerning the demand for age-related services are based on the assumptions that the Bank of Finland uses to assess the sustainability of the general government finances. Accordingly, age-related expenditure is projected to grow by an average annual rate of approximately 2% over 2026–2040 as the population continues to age. Age-related services comprise of healthcare and social services. The demand for other services is assumed to remain constant over the forecast period. As healthcare and social service costs account for approximately half of all general government spending, public sector employment will grow at a slower pace than age-related expenditure, at approximately 1% per annum.

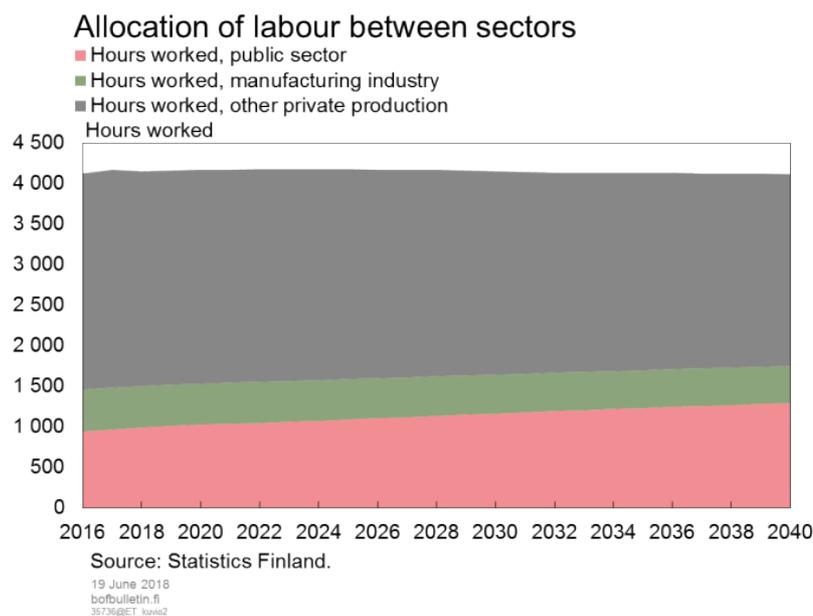
Manufacturing and other private production share the remainder of the labour force. The entire labour input, as measured by hours worked, is projected to shrink by approximately 8% over the years 2026–2040 (Chart 2).^[4]

The public sector's growing need for labour in the production of age-related services risks crowding out a considerable share of private output, particularly if productivity fails to meaningfully grow in public services.

3. Average hours worked declined even in positions of full-time employment from the early 2000s up until 2015. Working hours have since begun to grow slightly, but is thought to reflect the economy's cyclical phase instead of indicating a more sustained upwards trend.

4. Labour has not been evaluated by sector in the medium-term forecast. In Chart 2, values for the years 2016–2025 are based on calculations similar to those used in the long-term forecast.

Chart 2.



Growth in the capital stock slow

For the purposes of the model framework, capital input is derived from national accounting data on the net capital stock for each of the economy's three sectors. As the framework's real GDP figures do not include residential services, housing assets are similarly exempted from the capital stock.^[5]

The computation assumes that the recession only left a permanent mark on the actual volume of the capital base in manufacturing but not on its growth rate. In addition, it is assumed that the supply structure of manufacturing will effectively remain unchanged over the forecast period although its transformation might otherwise be considered a continuous process. Currently, Finnish exports are being supported by traditional export industries such as forestry and paper as well as metals and chemicals, while the output share of electrical engineering and electronics remains comparatively low. This situation is assumed to persist throughout the long-term forecast period.

The capital stock of manufacturing is expected to increase moderately at an annual pace of 0.3%. The growth rate has been revised upwards by approximately two-tenths of a percentage point from what was assumed in the previous forecast just over four years ago. At the time, the investment rate was thought to have permanently declined due to factors such as lowered growth expectations. The investment rate has since risen to approximately 23%, backed by three years of growth and revitalised investment activity,

5. The capital stock based on national accounting data is valued by purchase price and adjusted for depreciation. An alternative way of approximating the capital stock with respect to growth accounting would be to use an estimate of 'productive capital stock' published by Statistics Finland. While such estimates better reflect the productivity of capital than data obtained from national accounting, the latter was selected to maintain consistency with the assumptions made in the unobserved components model used for the medium-term forecast.

and has now returned to the average level it maintained in the decade preceding the financial crisis.

Although manufacturing's capital stock is projected to grow based on the given assumptions, its growth rate looks to remain substantially below the balanced-growth equilibrium. Achieving such a growth path would require the economy's capital base to grow at the combined pace of both productivity and labour,^[6] whereupon productivity-adjusted capital intensity (per worker) would continue unchanged. However, the more moderate growth path assumed in the forecast better represents the average historical trend growth of the capital stock.^[7]

The capital stock of other private sector production is projected to grow at a considerably quicker pace, at approximately 1.5% per annum. The growth rate is higher than in the previous long-term forecast (0.5%), as capital stock growth is now assumed to gradually adjust from its current pace towards the balanced growth rate. Growth in the capital stock of this sector has generally persisted at an annual rate between 1–2% since the mid-1990s.

The capital stock of the public sector steadily declined during the recession, despite the fact that the timing of public investments is partly determined by cyclical factors. However, public sector investment is expected to slightly increase over 2026–2040. Productivity growth in the public sector is ultimately driven by the improved organisation of existing tasks, but even achieving this often requires investment – into computing and information technology, for instance. Because the public sector's labour demands are projected to grow, even maintaining the current level of capital intensity per worker will require additional investment. The growth rate of capital stock in the public sector is expected to gradually adjust towards the balanced growth rate.

Total factor productivity growth to remain subdued

The longer the inspection horizon, the more economic growth is governed by the development of productivity within the economy. During the recession Finland's total factor productivity growth rate fell significantly below its trend, although it has since accelerated somewhat amid the economy's recovery.^[8] Over the forecast years 2026–2040, total factor productivity will continue to grow at a moderate pace, at approximately 1.0% per annum.

One important yet answered question pertaining to total factor productivity growth is the extent to which digitalisation and other rapidly changing technologies such as

6. The assumption of balanced growth in the capital stock is consistent with assumptions related to the model used to decompose historical trend data. To simplify calculations, each sector is assumed to observe its own balanced growth path.

7. The assumed growth rate of 0.3% is based on the average growth rate in the capital stock of manufacturing (excluding ICT) during the time period between the 1990s' recession and the post-crisis recession.

8. Finland's observed TFP trend growth may be somewhat underestimated in the early 2010s due to weak cyclical developments. The number of employed declined relatively little in light of the sharp decline in GDP during the years 2008–2009. Yet there is little evidence of a simultaneous slowdown in technological advancement of industries driving total factor productivity growth.

automation might contribute to productivity, especially in service production. In spite of all the progress seen in information technology leading up to this day, productivity growth has remained decidedly subdued across the advanced economies since the 1980s. However, recent productivity developments in Finland have undoubtedly been impacted by protracted recession. In the forecast's baseline scenario, total factor productivity growth is not projected to markedly accelerate. The baseline assumptions concerning productivity growth in each of the three productive sectors reach the same estimated magnitude of total factor productivity growth as outlined by the European Commission's Working Group on Ageing and Sustainability.^[9] According to the Commission, the Finnish economy's total factor productivity growth rate will fluctuate between 0.8–1.0% over 2026–2040, slightly accelerating towards the end of the forecast period. Across the EU countries (28), productivity growth is estimated to be approximately one-tenth of a percentage pointer higher over the same time period.

Not only is total factor productivity determined by the performance of productivity in individual sectors, but it is also influenced by changes in the structure of the economy. Total factor productivity has traditionally seen faster growth in manufacturing than in the service industries. Out of the economy's three sectors, manufacturing has been most effective in harnessing new technologies to leverage output. Thus, the technological intensity of manufacturing has increased rapidly. Since the recession of the 1990s, most of the productivity growth observed in manufacturing has stemmed from electrical engineering and electronics. Consequently, the effects of this industry's fading will long weigh on future productivity growth in manufacturing.

Productivity growth has in recent years managed to gain foothold in several industries belonging to private sector services. During the recession years, when productivity growth remained especially weak in manufacturing, total factor production growth in the economy actually largely rested upon private sector services.^[10] Productivity growth in public services, however, has remained subdued, and as the sector begins to account for an increasingly large share of output over the forecast period, so will its dampening effect on the economy's total factor productivity growth.

Total factor productivity growth for each of the three sectors decomposed for the model framework is estimated solely on the basis of its historical trend. Past performance can be obtained as a residual from the production function, as each sector's output growth and growth in capital stock is known.

In the baseline scenario, it is implicitly assumed that Finland's manufacturing sector will continue be supported by traditional industry. Thus, the projection for total factor productivity growth in manufacturing – 3% per annum – is based on the sector's average total productivity growth between 1997–2017, excluding electrical engineering and electronics.^[11]

9. Working Group on Ageing and Sustainability (2015).

10. According to Pohjola (2017), average annual total factor productivity growth in services helped offset the productivity decline of manufacturing during 2006–2015. Of the industries belonging to services, average total factor productivity growth remained highest in information and communications (0.2%), but growth also improved in distribution services (0.1%). (Pohjola, M. Tuottavuus, rakennemuutos ja talouskasvu 1975–2015. Kansantaloudellinen aikakauskirja 4/2017). Finnish only.

In other private sector production, the average annual rate of total factor productivity growth is projected at 1.5% and is also based on the sector's average growth over the past two decades. In the Bank of Finland's previous long-term growth forecast, it was assumed that the sector would underperform its historical trend, as the long-term effects of the recession were then estimated to be greater.

Total factor productivity growth has long been weak in the public services. Over the years 1997–2017, public sector total factor productivity growth declined at an average annual rate of up to 0.5%. Efforts to raise productivity in public service production have become increasingly determined, however, and in the baseline forecast it is assumed that this would have resulted in concrete productivity-boosting policies by 2025. These policies are assumed to prevent public sector total factor productivity from deteriorating during the forecast period, but no further assumptions are made with regards to their efficacy. Consequently, public sector total factor productivity growth is assumed to remain unchanged over the forecast years 2026–2040.

Growth to persist near 1.5% over the long term

Long-term growth forecasts are presented for both the whole economy^[12] as well as the public and private sectors (Table 1). The private sector includes both manufacturing industry and other private production.

Table 1.

Long-term growth forecast, average growth sector by sector

11. The selected time frame contains years of robust economic growth as well as the post-crisis recession.

Underlying growth in total factor productivity is still assumed to be governed by factors related to technology and technical change which are, in the long term, unaffected by the business cycle.

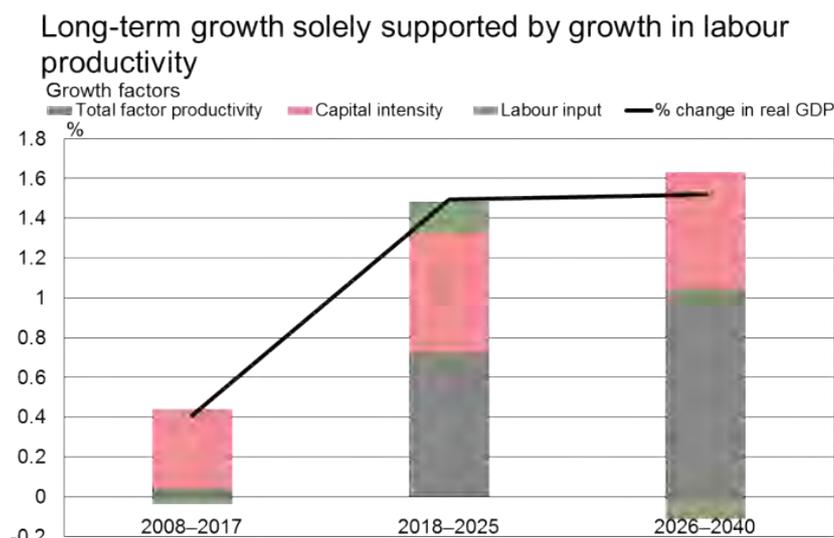
12. The levels of output calculated for each sector cannot be aggregated to produce total output by simply adding their fixed values together, as the relative prices between sectors may differ from the base year. For this reason, the whole economy's growth path has been calculated from the growth rate of each sector, weighted by their respective shares of value added. The share of value added accounts for the development of relative prices.

| Whole economy | 2026–2040 |
|---------------------------|------------------|
| GDP | 1.5 % |
| Labour | -0.1 % |
| Labour productivity | 1.6 % |
| Total factor productivity | 1.0 % |
| Capital intensity | 0.6 % |
| Private sektor | |
| Output | 2.0 % |
| Labour | -0.6 % |
| Labour productivity | 2.6 % |
| Total factor productivity | 1.8 % |
| Capital intensity | 0.8 % |
| Public sektor | |
| Output | 1.1 % |
| Labour | 1.1 % |
| Labour productivity | -0.1 % |
| Total factor productivity | 0.0 % |
| Capital intensity | -0.1 % |

Gross domestic product is projected to grow at an average rate of 1.5% over 2026–2040. This is slightly faster than in the previous forecast, where average growth was projected at 1.3% over 2025–2035.

In Chart 3, the long-term forecast's growth components are compared with those of the medium-term outlook over 2018–2015 as well as the decomposition of growth since the financial crisis. The most significant departure from the medium-term outlook is that labour is no longer seen to contribute to growth after the mid-2020s, effectively meaning that growth will only be driven by labour productivity. However, labour productivity itself which will gain support over the long term from a deepening capital base as well as growth in total factor productivity.

Chart 3.



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Of the factors underpinning growth in labour productivity, total factor productivity growth is projected to be strong especially in the private sectors of the economy. Accordingly, total factor productivity growth in the private sector is expected to adjust towards its historical trend path from the past two decades, both in manufacturing and other private production.^[13] Private sector productivity growth will also be backed by capital deepening. Not only will the capital stock itself expand, but capital intensity will increase on the back of the projected decline in the private sector's share of the labour input.

Public sector productivity growth will remain subdued throughout the forecast period. However, the sector's total factor productivity is not expected to further decline, in contrast to expectations in the previous long-term forecast. The effects of capital deepening will remain somewhat negative, as the capital stock is projected to grow at a slower pace than the labour input, resulting in slightly lowered capital intensity per employee.

Productivity growth will not only be governed by the sectoral performance of capital deepening and total factor productivity during the forecast period. Instead, productivity growth will also be dampened by the reallocation of resources from manufacturing and other private production into public service production where productivity growth is comparatively slower.

13. Much of the deviation from the previous long-term forecast stems from growth in total factor productivity. In the earlier forecast, the whole economy's total factor productivity growth rate was projected to remain near 0.5% over the entire forecast period.

Alternative scenarios

The outlook for economic growth in the years ahead will ultimately be governed by growth in productivity. Technological breakthroughs usually occur in global cycles, which a small economy such as Finland must take as given. However, the growth potential of the Finnish economy is also influenced by the path set out in domestic economic policy. As the working-age population continues to decline and a larger share of the labour force becomes tied to the production of age-related services, the scarcity of labour alone will set constraints on growth opportunities, even for the economy's most productive sectors. Therefore, the baseline forecast is now followed by a sensitivity analysis of two alternative scenarios with regards to the development of the labour input and public sector labour demand.

In the scenario following a better-than-predicted outcome, the supply of labour is assumed to develop more favourably than in the baseline. Here the Swedish labour market serves as an alternative benchmark, as its employment and participation rates have been considerably higher than those of Finland in recent years.

In the 'good scenario', labour market reforms are successfully implemented to bolster the labour supply and alleviate the prominence of skills mismatch. Structural unemployment is then assumed to settle at approximately 7%, which corresponds with the OECD estimate of Sweden's NAIRU (non-accelerating inflation rate of unemployment). Similarly, the participation rate (15-74-year-olds) is assumed to have reached the Swedish level of 70% by the beginning of the forecast period in 2026.

The assumption of improved public sector productivity growth is introduced into the framework by way of reducing public sector expenditure growth. In this scenario, it is assumed that a target of reducing healthcare and social service expenditure by EUR 3 billion is successfully met by 2030. These cost savings subsequently lower growth in the public sector's demand for labour.

Given these assumptions, real GDP would grow by approximately one-tenth of a percentage point faster during 2025–2040 than in the baseline calculation. Contraction in the labour input would have less of a detrimental impact on private sector growth compared with the baseline, and the private sector's larger share of total output would raise the economy's average productivity. However, the positive growth effects of a larger labour share in the private sector would be mitigated by its reduction in capital intensity.

In the scenario following a worse-than-predicted outcome, the prolonged recession permanently displaces part of the working-age population from the labour force. Labour market reforms to increase the labour supply fail to pass. The participation rate is assumed to remain at approximately 65% and the NAIRU at 8.5%. As for the public sector, it is assumed that the projected savings from the social and health care reform are completely lost and that public sector total factor productivity will decline by 0.2% each year over the forecast period.

Because the model assumes that public sector employment is determined by demand for public services, a greater decline in the labour input is only reflected in private sector output, whose growth rate would decline by approximately 0.2%. The labour share of the

public sector would increase compared with the baseline scenario, but would only suffice to compensate for weaker productivity growth compared with the baseline. Overall, the 'bad scenario' would reduce the average growth rate by approximately one-tenth of a percentage point.

Sustaining living standards in the future

The long-term growth prospects of the Finnish economy appear rather modest in light of the decades leading up to the financial crises. For the most part, however, the diminished rate of growth rate can be attributed to phenomena shared across the advanced economies. Total factor productivity has generally remained sluggish and the investment rate remained low for a sustained period. Output and employment positions in high-productivity manufacturing have both declined, and while increased employment in services has helped compensate for the loss of jobs in manufacturing, the service sector has not made up for the lost productivity growth. Population ageing is by no means a Finnish phenomenon – it has simply manifested itself slightly earlier compared with several other European countries. Looking to the future, the most important question is whether or not the technological progress of recent years, especially in the ICT sector, will finally begin to contribute to improved labour productivity. Could digitalisation establish itself as a general purpose technology, such as electricity, or will the benefits of new these technologies be largely restricted the ICT sector itself.

Finland's growth prospects are also limited by a variety of domestic issues, some of which might even be described as home grown. The recession coincided with a structural shift in manufacturing, where the output share of electrical engineering and electronics shrank into a fraction of its size before the recession. Finnish exports are once again dependent on basic industry whose productivity has been unable to match that of the ICT sector.

Labour force participation remains low compared with the other Nordics, and structural unemployment is poised to remain high. The growing demand for age-related services threatens to tie an increasingly large share of the country's labour resources to its public sector. Even Finland's product markets feature obstacles to competition which weaken productivity growth. All of the above, however, may at least in part be addressed through appropriate domestic economic policy.

Tags

[economic growth](#), [labour productivity](#), [labour supply](#), [productivity](#), [investment](#)

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FORECAST TABLES

Forecast for 2018–2020

19 JUN 2018 11:00 AM • BANK OF FINLAND BULLETIN 3/2018 • ECONOMIC OUTLOOK

See forecast tables for the Finnish economy in 2018–2020 (June 2018)

June 2018

1. BALANCE OF SUPPLY AND DEMAND, AT REFERENCE YEAR 2010 PRICES

% change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|-------------------------------|------|------|-------------------|-------------------|-------------------|
| GDP at market prices | 2.1 | 2.6 | 2.9 | 2.2 | 1.7 |
| Imports of goods and services | 5.7 | 3.5 | 3.1 | 2.8 | 2.6 |
| Exports of goods and services | 3.5 | 7.8 | 5.1 | 3.9 | 3.1 |
| Private consumption | 1.8 | 1.6 | 2.3 | 1.9 | 1.6 |
| Public consumption | 1.8 | 1.3 | 0.6 | 0.1 | 0.7 |
| Private fixed investment | 7.8 | 8.4 | 4.2 | 3.3 | 2.5 |
| Public fixed investment | 5.8 | -2.9 | 2.2 | 0.5 | 0.4 |

Source: Bank of Finland.

2. CONTRIBUTIONS TO GROWTH¹

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|------|------|-------------------|-------------------|-------------------|
| GDP, % change | 2.1 | 2.6 | 2.9 | 2.2 | 1.7 |
| Net exports | -0.8 | 1.5 | 0.8 | 0.5 | 0.2 |
| Domestic demand excl. inventory change | 2.9 | 2.6 | 2.2 | 1.7 | 1.5 |
| of which Consumption | 1.4 | 1.2 | 1.4 | 1.1 | 1.0 |
| Investment | 1.5 | 1.4 | 0.9 | 0.7 | 0.5 |
| Inventory change + statistical discrepancy | 0.0 | -1.4 | -0.1 | 0.0 | 0.0 |

¹ Bank of Finland calculations. Annual growth rates using the previous year's GDP shares at current prices as weights.

Source: Bank of Finland.

3. BALANCE OF SUPPLY AND DEMAND, PRICE DEFLATORS

Index 2010 = 100, and % change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|-------------------------------------|-------|-------|-------------------|-------------------|-------------------|
| GDP at market prices | 113.1 | 114.1 | 115.4 | 117.3 | 119.7 |
| | 0.8 | 0.9 | 1.1 | 1.6 | 2.0 |
| Imports of goods and services | 97.2 | 100.8 | 103.3 | 105.4 | 107.3 |
| | -3.2 | 3.8 | 2.5 | 2.0 | 1.9 |
| Exports of goods and services | 101.2 | 104.2 | 107.1 | 108.9 | 110.8 |
| | -1.8 | 2.9 | 2.8 | 1.7 | 1.7 |
| Private consumption | 111.5 | 112.5 | 113.5 | 115.0 | 117.0 |
| | 0.9 | 0.9 | 1.0 | 1.3 | 1.7 |
| Public consumption | 112.3 | 110.5 | 112.5 | 114.6 | 117.5 |
| | -0.6 | -1.6 | 1.8 | 1.9 | 2.6 |
| Private fixed investment | 111.1 | 113.3 | 115.8 | 118.7 | 121.7 |
| | 1.5 | 2.0 | 2.2 | 2.5 | 2.5 |
| Public fixed investment | 111.4 | 114.0 | 116.2 | 118.6 | 121.2 |
| | 1.1 | 2.3 | 1.9 | 2.0 | 2.2 |
| Terms of trade (goods and services) | 104.2 | 103.3 | 103.6 | 103.4 | 103.2 |
| | 1.4 | -0.8 | 0.3 | -0.2 | -0.1 |

Source: Bank of Finland.

4. BALANCE OF SUPPLY AND DEMAND, AT CURRENT PRICES

EUR million and % change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|---------|---------|-------------------|-------------------|-------------------|
| GDP at market prices | 215,773 | 223,522 | 232,593 | 241,575 | 250,720 |
| | 2.9 | 3.6 | 4.1 | 3.9 | 3.8 |
| Imports of goods and services | 79,350 | 85,226 | 90,032 | 94,380 | 98,680 |
| | 2.4 | 7.4 | 5.6 | 4.8 | 4.6 |
| Total supply | 295,123 | 308,748 | 322,625 | 335,955 | 349,400 |
| | 2.8 | 4.6 | 4.5 | 4.1 | 4.0 |
| Exports of goods and services | 77,749 | 86,252 | 93,143 | 98,439 | 103,262 |
| | 1.6 | 10.9 | 8.0 | 5.7 | 4.9 |
| Consumption | 170,772 | 173,539 | 178,689 | 183,858 | 189,858 |
| | 2.2 | 1.6 | 3.0 | 2.9 | 3.3 |
| Private | 119,067 | 122,017 | 125,959 | 130,062 | 134,300 |
| | 2.7 | 2.5 | 3.2 | 3.3 | 3.3 |
| Public | 51,705 | 51,522 | 52,730 | 53,796 | 55,559 |
| | 1.1 | -0.4 | 2.3 | 2.0 | 3.3 |
| Fixed investment | 46,549 | 50,503 | 53,592 | 56,458 | 59,080 |
| | 9.0 | 8.5 | 6.1 | 5.3 | 4.6 |
| Private | 37,828 | 41,833 | 44,563 | 47,196 | 49,580 |
| | 9.4 | 10.6 | 6.5 | 5.9 | 5.1 |
| Public | 8,721 | 8,670 | 9,029 | 9,263 | 9,500 |
| | 7.0 | -0.6 | 4.1 | 2.6 | 2.6 |
| Inventory change + statistical discrepancy | 53 | -1,546 | -2,800 | -2,800 | -2,800 |
| % of previous year's total demand | -0.3 | -0.5 | -0.4 | 0.0 | 0.0 |
| Total demand | 295,123 | 308,748 | 322,625 | 335,955 | 349,400 |

4. BALANCE OF SUPPLY AND DEMAND, AT CURRENT PRICES

| | | | | | |
|-----------------------|---------|---------|---------|---------|---------|
| | 2.8 | 4.6 | 4.5 | 4.1 | 4.0 |
| Total domestic demand | 217,374 | 222,496 | 229,481 | 237,517 | 246,138 |
| | 3.2 | 2.4 | 3.1 | 3.5 | 3.6 |

Source: Bank of Finland.

5. BALANCE OF SUPPLY AND DEMAND

% of GDP at current prices

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|-------|-------|-------------------|-------------------|-------------------|
| GDP at market prices | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Imports of goods and services | 36.8 | 38.1 | 38.7 | 39.1 | 39.4 |
| Exports of goods and services | 36.0 | 38.6 | 40.0 | 40.7 | 41.2 |
| Consumption | 79.1 | 77.6 | 76.8 | 76.1 | 75.7 |
| Private | 55.2 | 54.6 | 54.2 | 53.8 | 53.6 |
| Public | 24.0 | 23.1 | 22.7 | 22.3 | 22.2 |
| Fixed investment | 21.6 | 22.6 | 23.0 | 23.4 | 23.6 |
| Private | 17.5 | 18.7 | 19.2 | 19.5 | 19.8 |
| Public | 4.0 | 3.9 | 3.9 | 3.8 | 3.8 |
| Inventory change + statistical discrepancy | 0.0 | -0.7 | -1.2 | -1.2 | -1.1 |
| Total demand | 136.8 | 138.1 | 138.7 | 139.1 | 139.4 |
| Total domestic demand | 100.7 | 99.5 | 98.7 | 98.3 | 98.2 |

Source: Bank of Finland.

6. PRICES

Index 2010 = 100, and % change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|---|-------|-------|-------------------|-------------------|-------------------|
| Harmonised index of consumer prices, 2005 = 100 | 100.4 | 101.2 | 102.2 | 103.2 | 104.8 |
| | 0.4 | 0.8 | 0.9 | 1.0 | 1.5 |
| Consumer price index, 2005 = 100 | 119.7 | 120.6 | 121.7 | 123.0 | 125.0 |
| | 0.4 | 0.8 | 0.8 | 1.1 | 1.7 |
| Private consumption deflator | 111.5 | 112.5 | 113.5 | 115.0 | 117.0 |
| | 0.9 | 0.9 | 1.0 | 1.3 | 1.7 |
| Private investment deflator | 111.1 | 113.3 | 115.8 | 118.7 | 121.7 |
| | 1.5 | 2.0 | 2.2 | 2.5 | 2.5 |
| Exports of goods and services deflator | 101.2 | 104.2 | 107.1 | 108.9 | 110.8 |
| | -1.8 | 2.9 | 2.8 | 1.7 | 1.7 |
| Imports of goods and services deflator | 97.2 | 100.8 | 103.3 | 105.4 | 107.3 |
| | -3.2 | 3.8 | 2.5 | 2.0 | 1.9 |
| Value-added deflators | 113.0 | 113.9 | 115.7 | 117.7 | 119.9 |
| Value-added, gross at basic prices | 0.8 | 0.8 | 1.6 | 1.7 | 1.8 |
| | 112.6 | 114.2 | 115.9 | 117.9 | 119.9 |
| Private sector | 1.3 | 1.4 | 1.5 | 1.7 | 1.7 |
| | 114.2 | 112.5 | 114.8 | 116.9 | 119.9 |
| Public sector | -1.1 | -1.5 | 2.0 | 1.9 | 2.6 |

Source: Bank of Finland.

7. WAGES AND PRODUCTIVITY

% change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|---|------|------|-------------------|-------------------|-------------------|
| Whole economy | | | | | |
| Index of wage and salary earnings | 0.9 | 0.2 | 2.2 | 2.2 | 2.6 |
| Compensation per employee | 1.2 | -1.2 | 1.0 | 2.0 | 3.2 |
| Unit labour costs | -0.6 | -2.7 | -0.6 | 0.6 | 1.9 |
| Labour productivity per employed person | 1.7 | 1.5 | 1.6 | 1.4 | 1.3 |

Source: Bank of Finland.

8. LABOUR MARKET

1,000 persons and % change on previous year

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|-------|-------|-------------------|-------------------|-------------------|
| Labour force survey (15–74-year-olds) | | | | | |
| Employed persons | 2,447 | 2,474 | 2,508 | 2,527 | 2,537 |
| | 0.4 | 1.1 | 1.4 | 0.8 | 0.4 |
| Unemployed persons | 236 | 234 | 218 | 212 | 207 |
| | -6.4 | -0.9 | -6.9 | -2.6 | -2.2 |
| Labour force | 2,683 | 2,708 | 2,725 | 2,739 | 2,744 |
| | -0.2 | 0.9 | 0.6 | 0.5 | 0.2 |
| Working-age population (15–64-year-olds) | 3,463 | 3,451 | 3,440 | 3,433 | 3,426 |
| | -0.4 | -0.3 | -0.3 | -0.2 | -0.2 |
| Labour force participation rate, % | 65.3 | 65.8 | 66.2 | 66.4 | 66.6 |
| Unemployment rate, % | 8.8 | 8.6 | 8.0 | 7.7 | 7.5 |
| Employment rate (15–64-year-olds), % | 68.7 | 69.6 | 70.9 | 71.5 | 71.9 |

Source: Bank of Finland.

9. GENERAL GOVERNMENT REVENUE, EXPENDITURE, BALANCE AND DEBT

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|---|-------|-------|-------------------|-------------------|-------------------|
| % of GDP | | | | | |
| General government revenue | 54.2 | 53.2 | 52.1 | 51.3 | 51.3 |
| General government expenditure | 56.0 | 53.7 | 52.9 | 52.0 | 51.6 |
| General government primary expenditure | 54.9 | 52.7 | 52.0 | 51.2 | 50.9 |
| General government interest expenditure | 1.1 | 1.0 | 0.9 | 0.8 | 0.8 |
| General government net lending | -1.8 | -0.6 | -0.8 | -0.6 | -0.3 |
| Central government | -2.7 | -1.7 | -1.7 | -1.1 | -0.6 |
| Local government | -0.4 | -0.1 | -0.3 | -0.4 | -0.4 |
| Social security funds | 1.3 | 1.2 | 1.1 | 0.9 | 0.7 |
| General government primary balance | -0.7 | 0.4 | 0.1 | 0.2 | 0.5 |
| General government debt (EDP) | 63.0 | 61.4 | 60.2 | 59.4 | 58.2 |
| Central government debt | 47.4 | 47.3 | 46.7 | 46.1 | 45.0 |
| Tax ratio | 44.1 | 43.4 | 42.5 | 41.9 | 42.0 |
| Current prices, EUR billion | | | | | |
| General government net lending | -3.9 | -1.3 | -1.9 | -1.5 | -0.8 |
| Central government | -5.8 | -3.8 | -3.9 | -2.7 | -1.4 |
| Local government | -1.0 | -0.2 | -0.6 | -0.9 | -1.1 |
| Social security funds | 2.9 | 2.8 | 2.6 | 2.1 | 1.7 |
| General government debt (EDP) | 136.0 | 137.3 | 139.9 | 143.4 | 145.8 |

Source: Bank of Finland.

10. BALANCE OF PAYMENTS

EUR billion

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|---|------|------|-------------------|-------------------|-------------------|
| Exports of goods and services (SNA) | 77.7 | 86.3 | 93.1 | 98.4 | 103.3 |
| Imports of goods and services (SNA) | 79.4 | 85.2 | 90.0 | 94.4 | 98.7 |
| Goods and services account (SNA) | -1.6 | 1.0 | 3.1 | 4.1 | 4.6 |
| % of GDP | -0.7 | 0.5 | 1.3 | 1.7 | 1.8 |
| Investment income and other items, net (+ statistical discrepancy) | 3.4 | 2.7 | 1.6 | 0.5 | 0.5 |
| Current transfers, net | -2.5 | -2.1 | -2.6 | -2.7 | -2.9 |
| Current account, net | -0.7 | 16.0 | 2.1 | 1.8 | 2.2 |
| Net lending, % of GDP | | | | | |
| Private sector | 1.4 | 1.1 | 1.7 | 1.5 | 1.3 |
| Public sector | -1.8 | -0.4 | -0.8 | -0.7 | -0.4 |
| Current account, % of GDP | -0.3 | 0.7 | 0.9 | 0.7 | 0.9 |

Source: Bank of Finland.

11. INTEREST RATES

%

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|---|------|------|-------------------|-------------------|-------------------|
| 3-month Euribor ¹ | -0.3 | -0.3 | -0.3 | -0.2 | 0.2 |
| Average interest rate on new loan drawdowns ² | 1.9 | 2.0 | 1.9 | 2.0 | 2.2 |
| Average interest rate on the stock of loans ² | 1.5 | 1.5 | 1.4 | 1.5 | 1.8 |
| Average interest rate on the stock of deposits ³ | 0.2 | 0.2 | 0.1 | 0.2 | 0.4 |
| Yield on Finnish 10-year government bonds ¹ | 0.4 | 0.5 | 0.8 | 1.0 | 1.2 |

¹ Technical assumption derived from market expectations.

² Finnish credit institutions' loans to households and non-financial corporations (excl. overdrafts, credit card credits and repurchase agreements).

³ Finnish credit institutions' deposits from households and non-financial corporations.

Source: Bank of Finland.

12. INTERNATIONAL ENVIRONMENT

The Eurosystem staff projections

| | 2016 | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|-------|-------|-------------------|-------------------|-------------------|
| GDP, % change on previous year | | | | | |
| World | 3.1 | 3.6 | 3.8 | 3.6 | 3.5 |
| USA | 1.5 | 2.3 | 2.8 | 2.5 | 2.1 |
| Euro area | 1.8 | 2.5 | 2.1 | 1.9 | 1.7 |
| Japan | 1.0 | 1.7 | 1.0 | 0.8 | 0.1 |
| Imports, % change on previous year | | | | | |
| World | 2.2 | 5.1 | 5.1 | 4.6 | 4.0 |
| USA | 1.3 | 4.0 | 5.7 | 6.3 | 5.1 |
| Euro area | 4.7 | 4.6 | 4.1 | 4.7 | 4.0 |
| Japan | -1.6 | 3.4 | 4.0 | 3.8 | 2.0 |
| Index, 2010 = 100, and % change on previous year | | | | | |
| Import volume in Finnish export markets | 121.2 | 128.5 | 134.8 | 140.6 | 145.9 |
| | 2.6 | 6.0 | 4.9 | 4.3 | 3.7 |
| Export prices (excl. oil) of Finland's trading partners, national currencies | 106.0 | 109.5 | 113.4 | 116.3 | 118.8 |
| | -2.1 | 3.3 | 3.6 | 2.5 | 2.2 |
| Export prices (excl. oil) of Finland's trading partners, in euro | 101.7 | 104.7 | 105.0 | 107.7 | 110.0 |
| | -4.6 | 3.0 | 0.3 | 2.5 | 2.2 |
| Industrial raw materials (excl. energy), HWWA index, in US dollars | 97.3 | 118.2 | 132.7 | 133.1 | 138.4 |
| | -2.8 | 21.5 | 12.2 | 0.3 | 4.0 |
| Oil price, USD per barrel ¹ | 44.0 | 54.4 | 74.5 | 73.5 | 68.7 |
| | -15.9 | 23.5 | 36.9 | -1.3 | -6.6 |
| Finland's nominal competitiveness indicator ^{1, 2} | 103.3 | 103.6 | 107.0 | 107.0 | 107.0 |

12. INTERNATIONAL ENVIRONMENT

| | | | | | |
|--|------|------|------|------|------|
| | 2.6 | 0.3 | 3.3 | 0.0 | 0.0 |
| US dollar value of one euro ¹ | 1.11 | 1.13 | 1.20 | 1.18 | 1.18 |
| | -0.2 | 2.1 | 6.2 | -1.2 | 0.0 |

¹ Technical assumption derived from market expectations.

² Broad nominal effective exchange rate.

Source: Bank of Finland.

13. CURRENT AND DECEMBER 2017 FORECAST

| | 2017 | 2018 ^f | 2019 ^f | 2020 ^f |
|--|------|-------------------|-------------------|-------------------|
| GDP, % change | 2.6 | 2.9 | 2.2 | 1.7 |
| December 2017 | 3.1 | 2.5 | 1.6 | 1.2 |
| Inflation (HICP), % | 0.8 | 0.9 | 1.0 | 1.5 |
| December 2017 | 0.8 | 1.1 | 1.4 | 1.5 |
| Current account, % of GDP | 0.7 | 0.9 | 0.7 | 0.9 |
| December 2017 | 0.0 | 0.0 | 0.0 | 0.2 |
| General government net lending, % of GDP | -0.6 | -0.8 | -0.7 | -0.4 |
| December 2017 | -1.1 | -1.4 | -1.0 | -0.7 |
| General government debt (EDP), % of GDP | 61.4 | 60.2 | 59.5 | 58.3 |
| December 2017 | 61.8 | 61.3 | 61.4 | 60.8 |
| Unemployment rate, % | 8.6 | 8.0 | 7.7 | 7.5 |
| December 2017 | 8.6 | 8.2 | 7.9 | 7.6 |

Source: Bank of Finland.

Tags

[economic situation](#), [forecast](#), [indicators](#)