NBP Narodowy Bank Polski

Economic Institute

Inflation projection of Narodowy Bank Polski based on the NECMOD model

Warsaw / 15 March 2016

Outline

1	Changes between projection rounds
2	Projection 2016 - 2018
3	Uncertainty

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

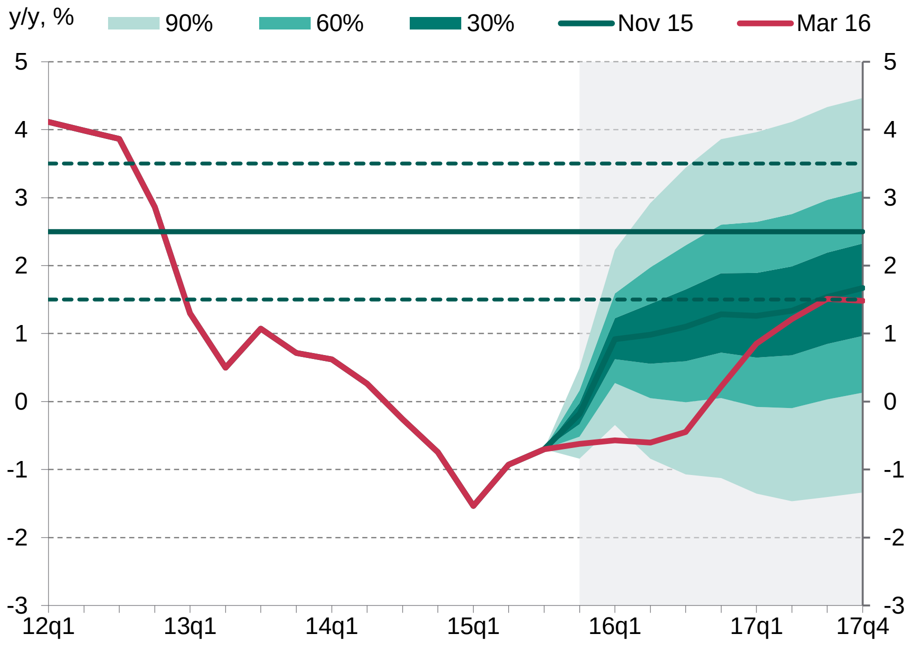
Changes between projection rounds

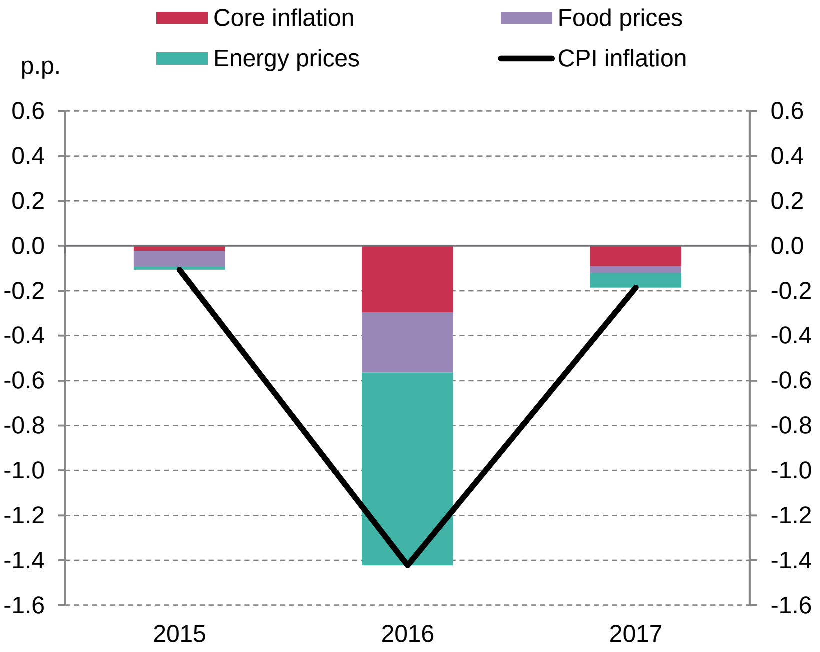
- Changes in the projection assumptions
- March projection compared to November projection

Changes in the projection assumptions

- External environment:
  - significantly lower global prices of energy commodities (esp. of oil)
  - similar assumptions about economic growth abroad,
  - lower interest rates in the euro area and the United Kingdom, and - in 2017 - in USA.
- Data on GDP in the second half of 2015 exceed the expectations of the November projection, amidst lower investment, but higher inventories and higher contribution of net exports to growth.
- Accounting for the impact of the "Family 500+" programme in the projection (higher gross disposable income of households) and the Act on Tax on Certain Financial Institutions (weaker corporate and household investment).
- Change in the regulated domestic prices at home in response to the slump in the global energy commodity prices.
- Weaker EUR/PLN exchange rate at the projection starting point.

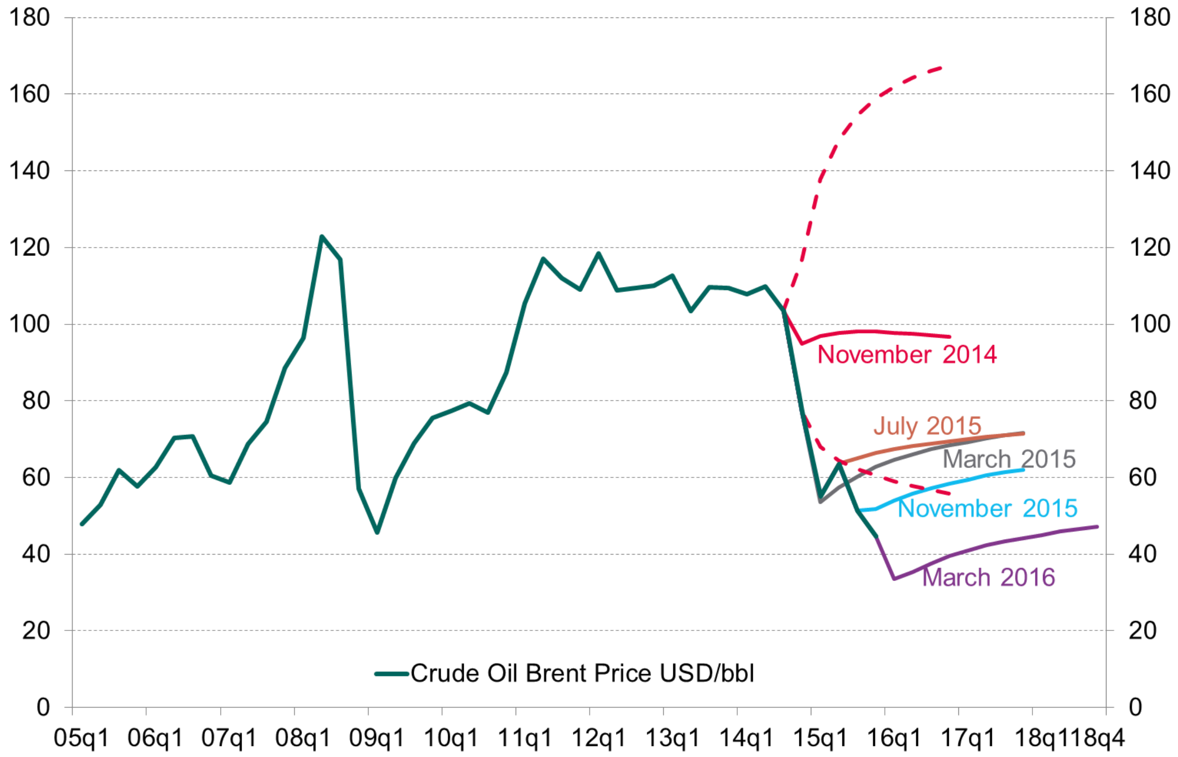
March CPI projection compared to November projection





Source: CSO data, NBP calculations

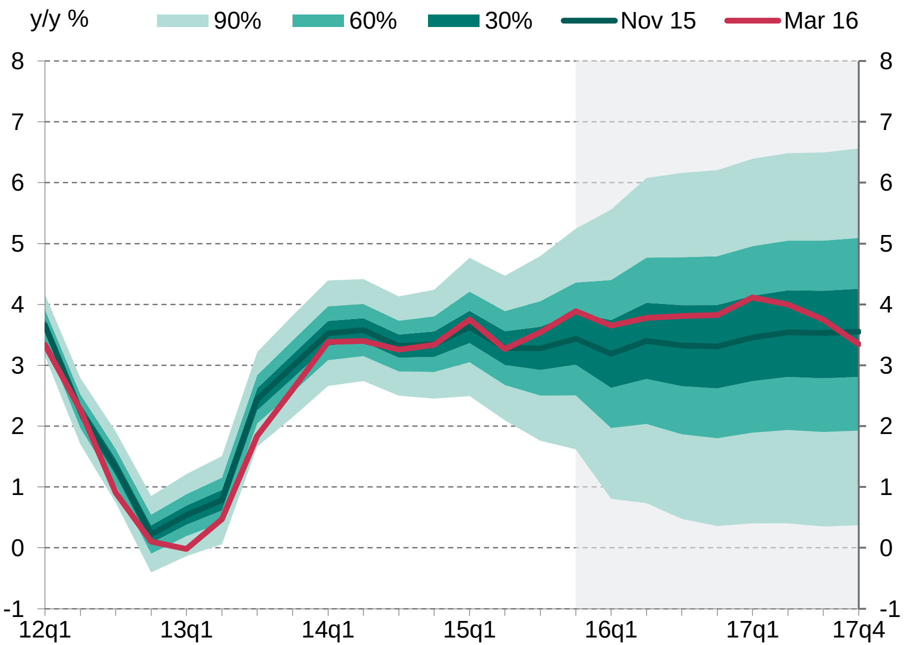
Revisions of oil price forecasts

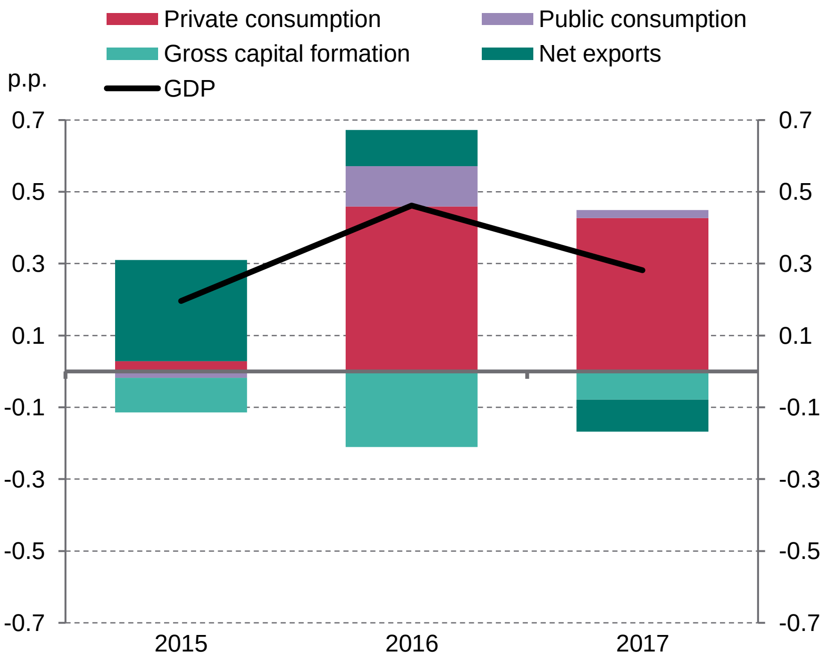


Source: Bloomberg, NBP calculations

- Forecasts of oil prices based on futures contracts (quoted at ICE in London)
- The futures included in the 2014 November projection pointed to the relatively stable price of this commodity, i.e. well above the realisation that we know today.
- The extent of the unexpected decline in oil prices is indicated by the fact that the realisation was outside the 90% confidence interval based on the errors of previous forecasts (years 2005-14).

March GDP projection compared to November projection





Source: CSO data, NBP calculations

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

Projection for 2016-2018

- Projection scenario
- Economic conditions abroad
- Aggregate demand
- Inflation

Projection scenario

- Private consumption will be the main driver of GDP growth, with gross fixed capital formation declining on the levels observed in the past few quarters.
- Private consumption growth is supported by steady improvement in households' financial situation (a rise in family benefits - the "Family 500+" programme) and good labour market conditions (declining unemployment, accelerated wage growth) amid a relatively high voluntary savings rate and the possibility of financing consumption with credit (low interest rates).
- Investment growth will continue to exceed GDP growth. It will be supported by the assumption of constant and low interest rates and rising consumer demand due to the increased family benefits. Heightened uncertainty in the global financial markets and concerns about the future tax burden will curb corporate investment plans. Investment may also be adversely affected by the tax on certain financial institutions, effective from February 2016.
- The output gap, negative since 2012, will close in early 2017 and subsequently stabilise at a marginally positive level.
- The persistent deflation results primarily from supply-side factors - a slump in oil prices and high supply of agricultural produce, which results in consistently low cost pressure in the economy, reflected in declining import and producer prices.
- In the projection horizon, the impact of the downward influences on inflation will gradually subside, yet CPI growth will persist below the NBP inflation target (due to the forecast slow rise in global commodity prices and moderate recovery abroad, amid a close-to-zero output gap).

Outline:

Changes between rounds

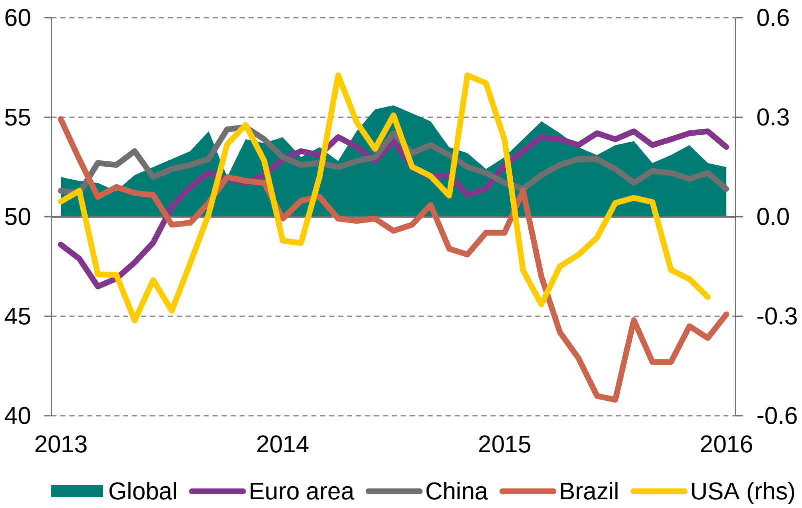
Projection 2016 - 2018

Uncertainty

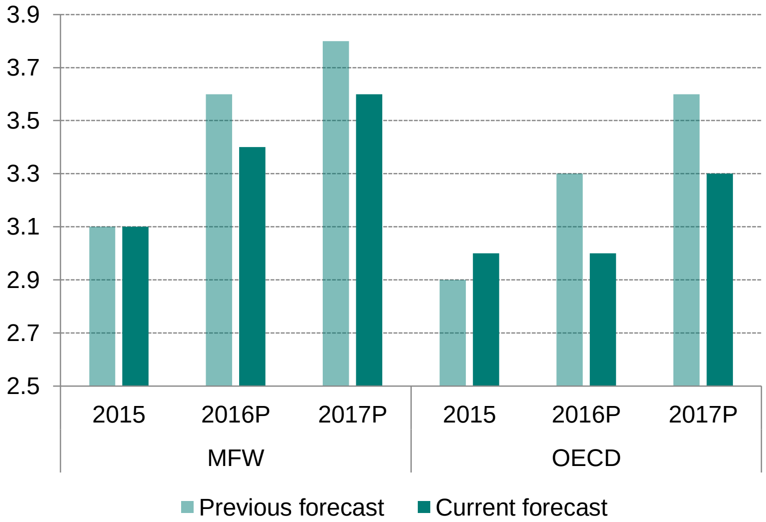
Economic conditions abroad

Global economic activity

Activity in manufacturing and services*



GDP growth (y/y, %) in the global economy



- Signs of weakening at the turn of 2015 are observed

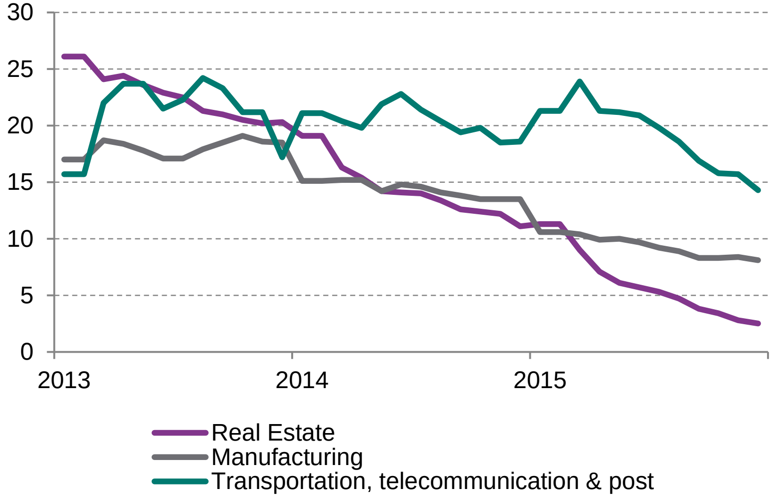
- International institutions have revised downwards their forecasts of global growth due to the weaker outlook for emerging economies (mainly those in Latin America). Expectations about growth in developed economies have also deteriorated slightly.

Source: IMF (World Economic Outlook), Markit, Chicago Fed, OECD

*PMI Composite; for USA - Chicago Fed National Activity Index (3-month average)

Slowdown in China

Gross fixed capital formation (%, y/y, cumulative since beginning of year)



Forecasts of growth in China (y/y, %)

		2016	2017	2018
World Bank	Jan-16	6.7	6.5	6.5
IMF	Jan-16	6.3	6	-
OECD	Feb-16	6.5	6.2	-
Bloomberg	Feb-16	6.5	6.3	6.4

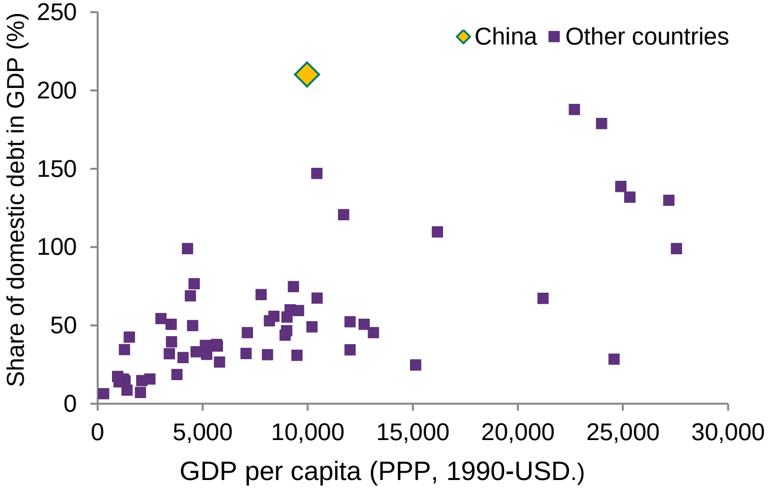
The slowdown in China results from:

- adjustments in property investment, as well as investment in production capacity in industry (notably heavy industry) following a period of overinvestment
- weak demand for Chinese exports
- measures taken by the Chinese authorities, such as relaxing lending criteria, coupled with a sharp rise in consumption are mitigating the rate of the economic slowdown
- in effect, international institutions envisage a relatively soft landing in China in the coming years.

Source: Reuters Datastream, World Bank, IMF, OECD, Bloomberg

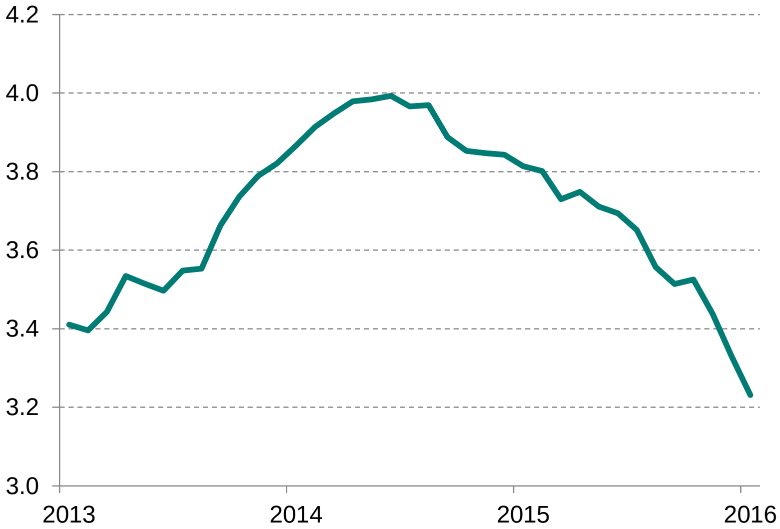
Risk of sharper slowdown in Chinese economy

Chinese debt level is very high in comparison with other countries



- Stabilisation of economic growth in China occurs at the expense of a further increase in the debt level, which adds to the risk of a deeper collapse in economic activity

Stock of foreign exchange reserves in China (USD tn)

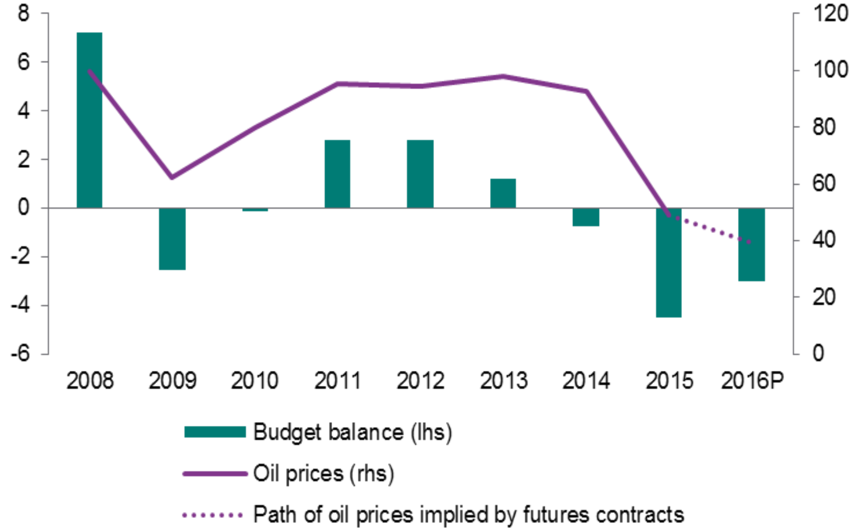


- Mounting pessimism concerning the outlook for the Chinese economy is reflected in an outflow of capital from China and a decline in foreign exchange reserves

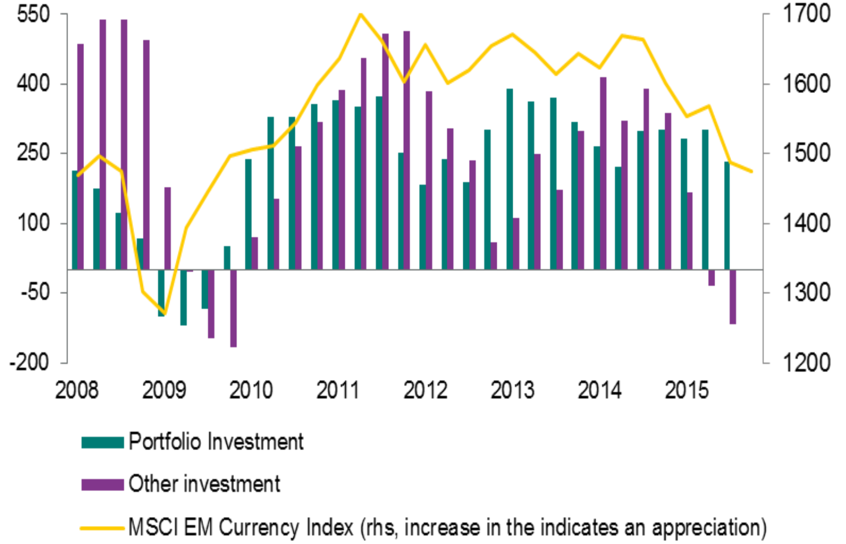
Source: World Bank, Conference Board, Bloomberg

Economic climate in other emerging economies

Budget balance of oil-producing countries (%) and price of oil (USD/bbl)



Net inflow of capital* and the value of basket of emerging market currencies vis-a-vis USD

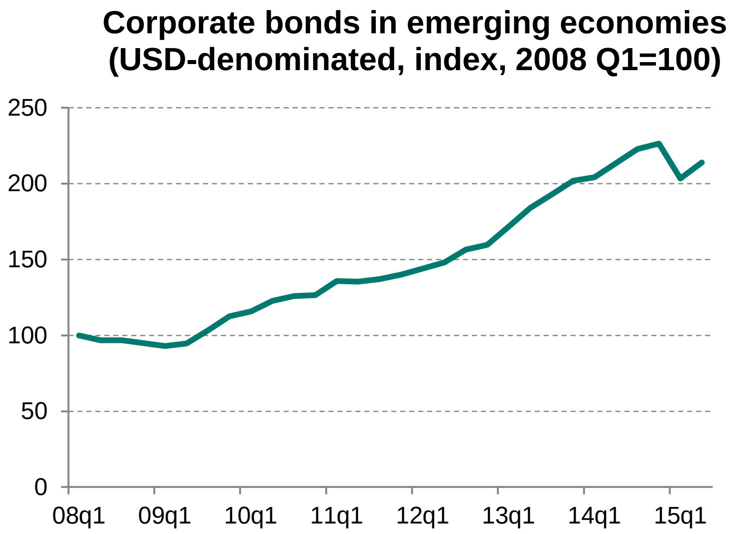


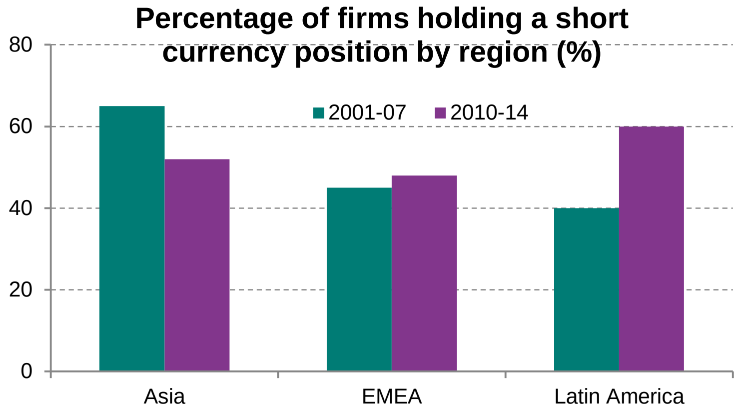
- The drop in demand from China is affecting the other emerging economies adversely.
- Economic conditions in these countries are further aggravated by the fall in oil prices, outflow of capital related to the normalisation of monetary policy by the Fed and the end stage of the credit cycle.
- The depreciation of emerging country currencies and the mounting budget deficit are narrowing the room for economic and monetary policy easing.

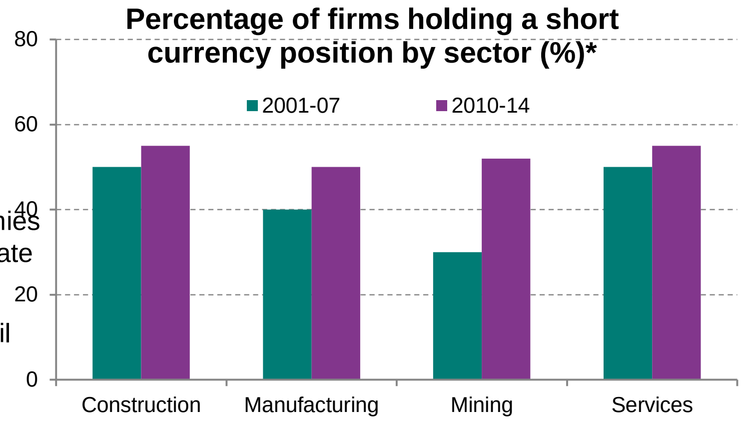
Source: IMF (Fiscal Monitor, Balance of Payments Statistics), Bloomberg

*Balance of non-residents' investment in emerging economies (USD bn, sum of 4 quarters)

Risk involved in rising debt of emerging economies







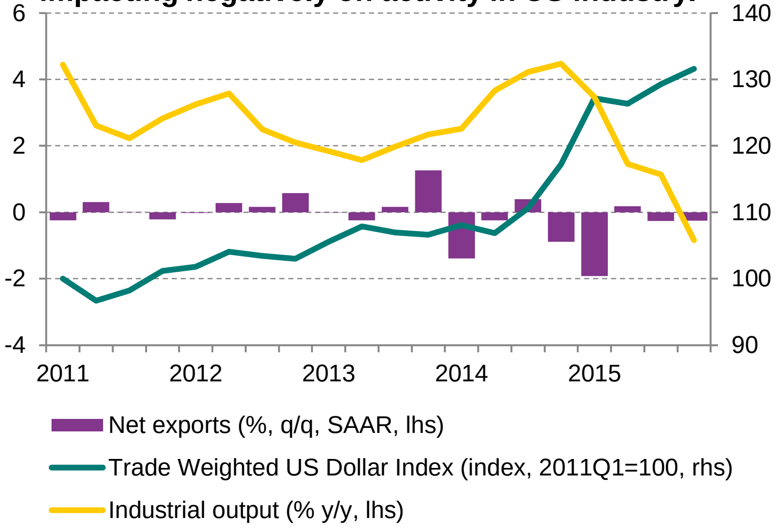
- A sharp rise in debt (including USD-denominated debt) in some emerging economies was accompanied by a growing mismatch between currency-denominated corporate assets and liabilities, especially in the mining sector.
- This increases the vulnerability of these economies to a simultaneous decline in oil prices, depreciation of their currencies and a rise in financing costs related to monetary policy normalisation by the Fed

Source: BIS. IMF

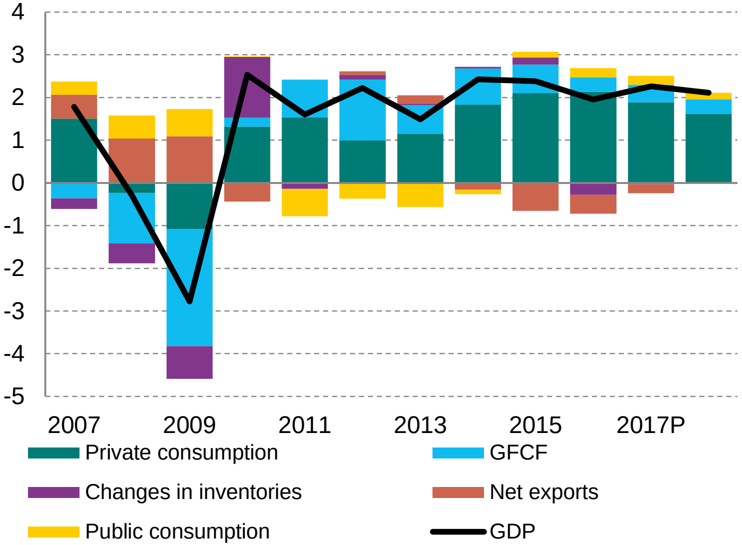
*Asia not included

Economic conditions in the United States

The strong dollar, low oil prices and weak external demand are impacting negatively on activity in US industry.



Decomposition of GDP growth (y/y, %)



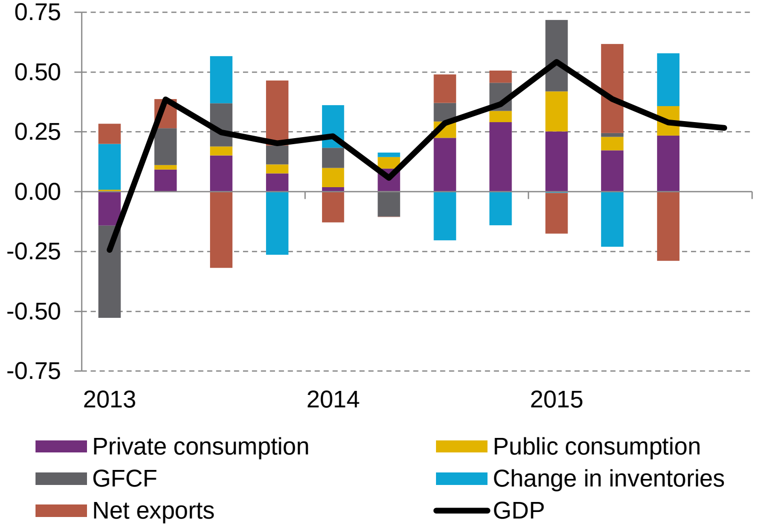
Growth prospects in the USA have deteriorated in comparison with the previous projection due to:

- an extended period of adjustments in the mining sector and the related weak activity in manufacturing
- a drop in the expectations of growth in the external environment of the economy

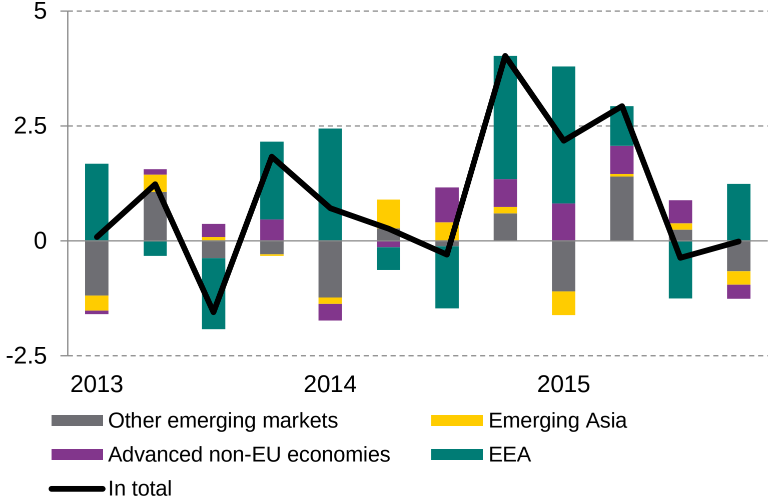
Source: FRB, BEA, own calculations

GDP in the euro area

GDP in 2015 Q3 (q/q, %)



Growth (q/q,%) and breakdown of nominal export of goods from Germany by main target market (percentage points)

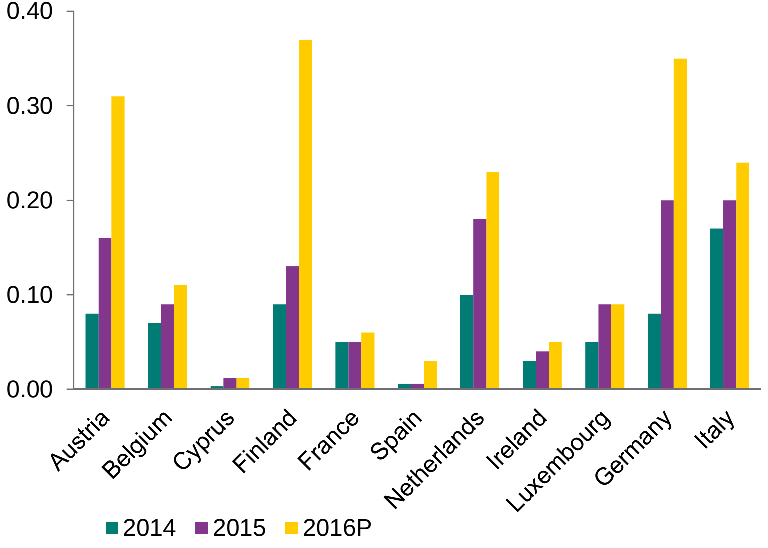


- Growth in the euro area will run slightly below the assumptions of the November projection.
- The slump in oil prices, strong consumer sentiment, the improvement in the labour market and the reduction in income taxes in some countries are conducive to private consumption growth.
- Moreover, public consumption is rising on the back of the migrant crisis.
- Yet, weak conditions in emerging economies are having an adverse effect on the exports of euro area countries

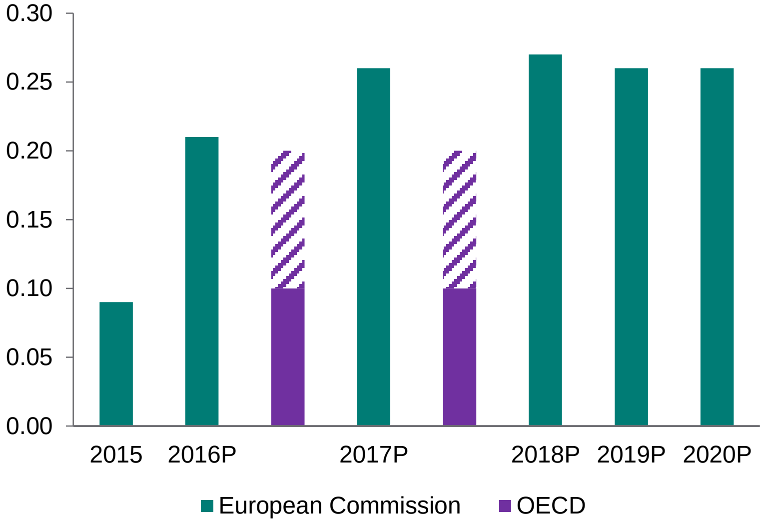
Source: Eurostat

Economic aftermath of the migrant crisis

General government spending related to receiving the refugees by country (% GDP)



Forecast impact of immigration on GDP growth (percentage points)

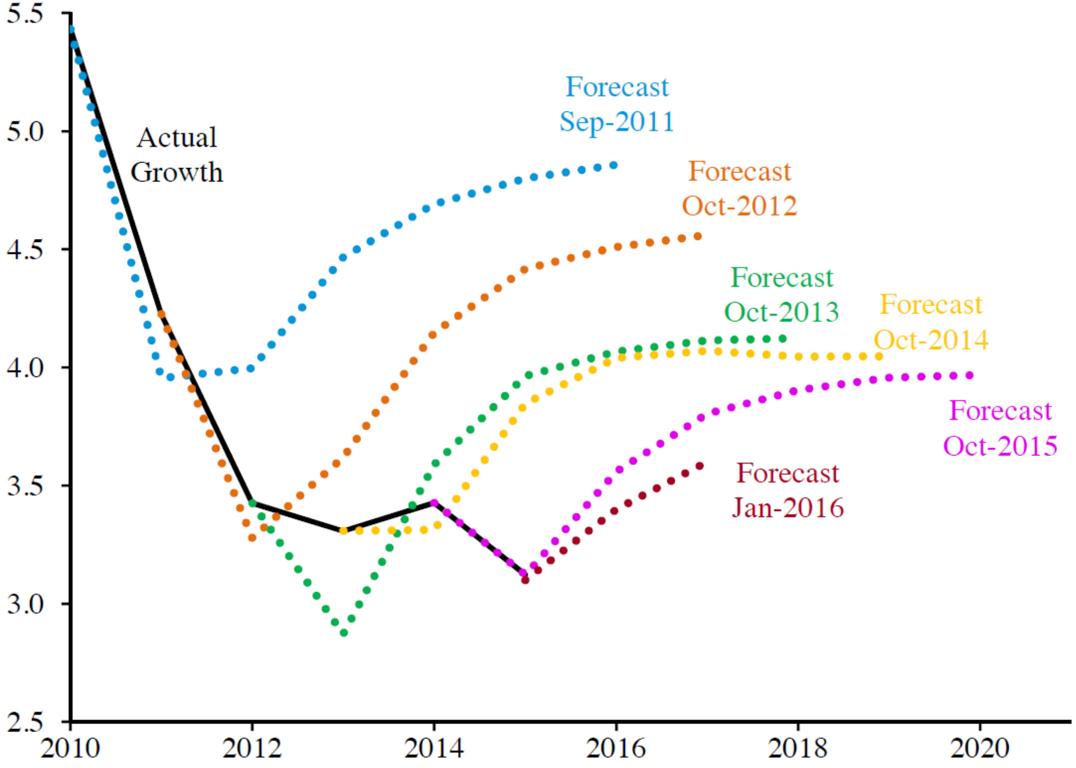


- In the short run, the inflow of refugees translates into higher budget spending.
- Low propensity to save amongst asylum-seekers may translate into higher private consumption in the medium term.
- In the long term, the economic impact will depend on the degree of integration of the migrants into the European labour market.

Source: IMF, European Commission, OECD

Global GDP forecast revisions

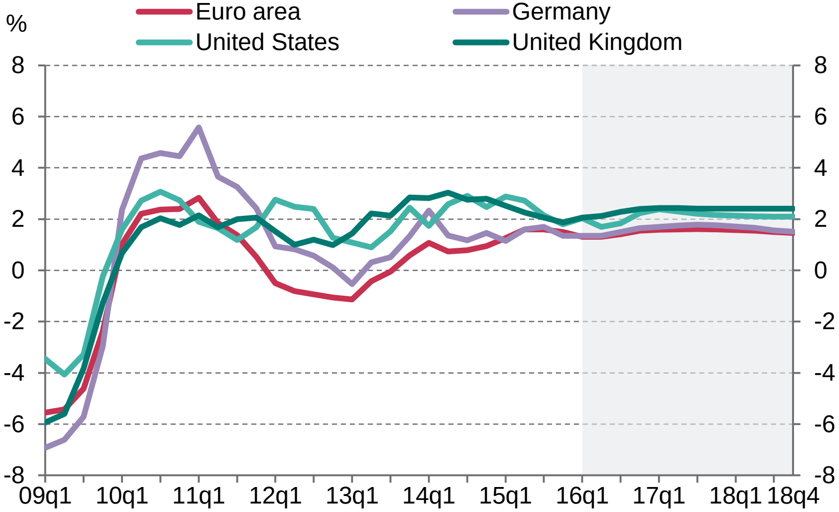
IMF World Real GDP Growth Forecast, 2010-2020 (percent change, Year-over-Year).

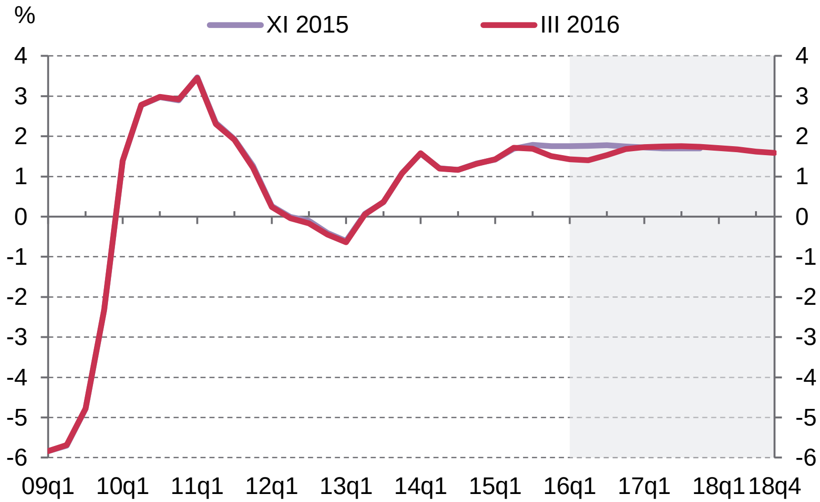


Source: IMF

GDP abroad

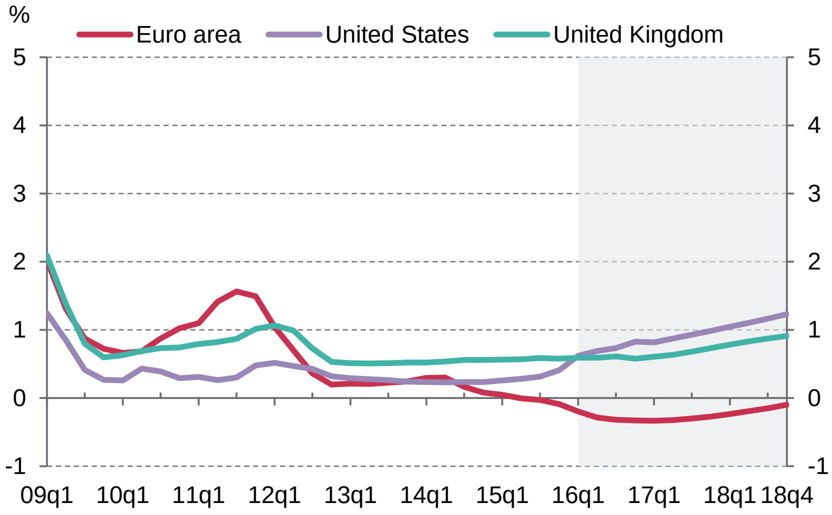
(similar)

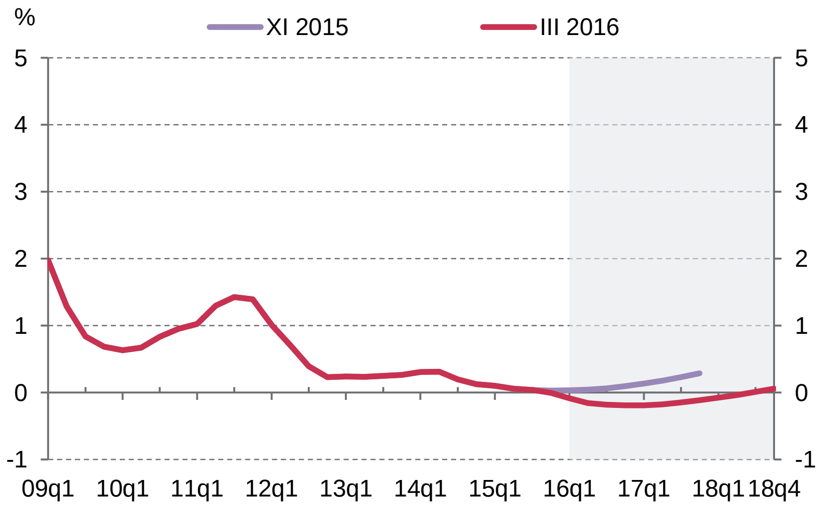




Source: Bloomberg, Eurostat data, NBP calculations

Interest rates abroad
(lower)





Source: Bloomberg data, NBP calculations

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

Aggregate demand

- Consumption demand
- Government demand
- Investment demand
- Foreign trade

GDP and its components– 2015Q3 and 2015Q4

	15q3		15q4	
GDP (y/y) (%)	3.5	(3.3)	3.9	(3.4)
Domestic demand (y/y) (%)	3.2	(3.8)	4.2	(3.8)
Private consumption (y/y) (%)	3.1	(3.0)	3.3	(3.1)
Public consumption (y/y) (%)	2.4	(3.3)	4.4	(2.6)
Gross fixed capital formation (y/y) (%)	4.6	(7.2)	4.9	(6.5)
Exports (y/y) (%)	3.9	(4.6)	4.4	(4.9)
Imports (y/y) (%)	3.1	(5.7)	5.0	(5.7)
Net exports contribution (p.p.)	0.4	(-0.4)	-0.2	(-0.4)

Values from the November projection are given in brackets (seasonally adjusted).
Indicators with values higher than in the November projection are marked green, whereas indicators with lower values are marked red.
Values for 15q4 are the estimates of NBP IE and constitutes the starting point for March projection.

Source: CSO data, NBP calculations

Labour market — 2015Q3 and 2015Q4

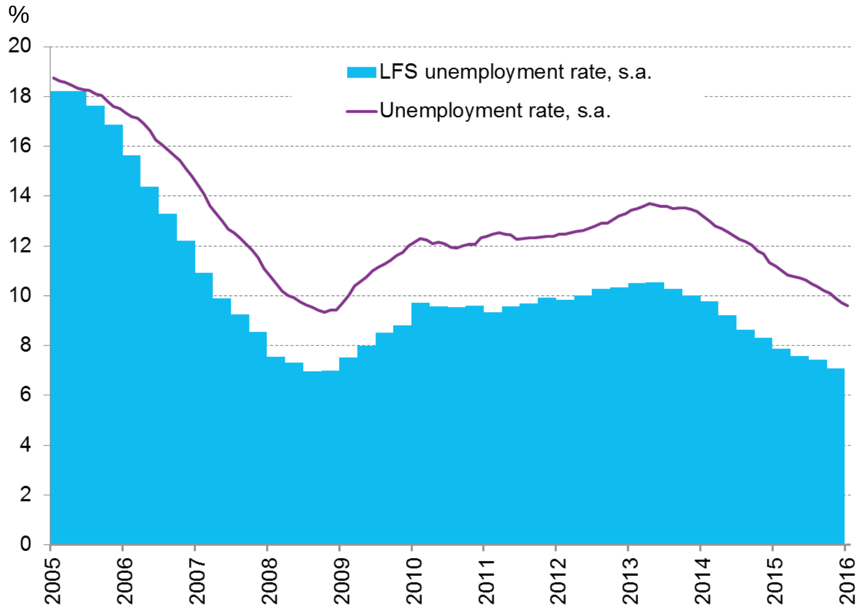
	15q3		15q4	
ULC (y/y) (%)	0.7	(1.0)	1.1	(0.9)
Labour productivity (y/y) (%)	2.5	(2.7)	2.3	(3.0)
Gross wages (y/y) (%)	3.0	(3.8)	3.2	(4.0)
Total employment LFS (y/y) (%)	1.1	(0.6)	1.6	(0.4)
Unemployment rate LFS (%)	7.5	(7.1)	7.1	(7.0)
Participation rate (%)	56.2	(55.9)	56.3	(55.9)

Source: CSO data, NBP calculations

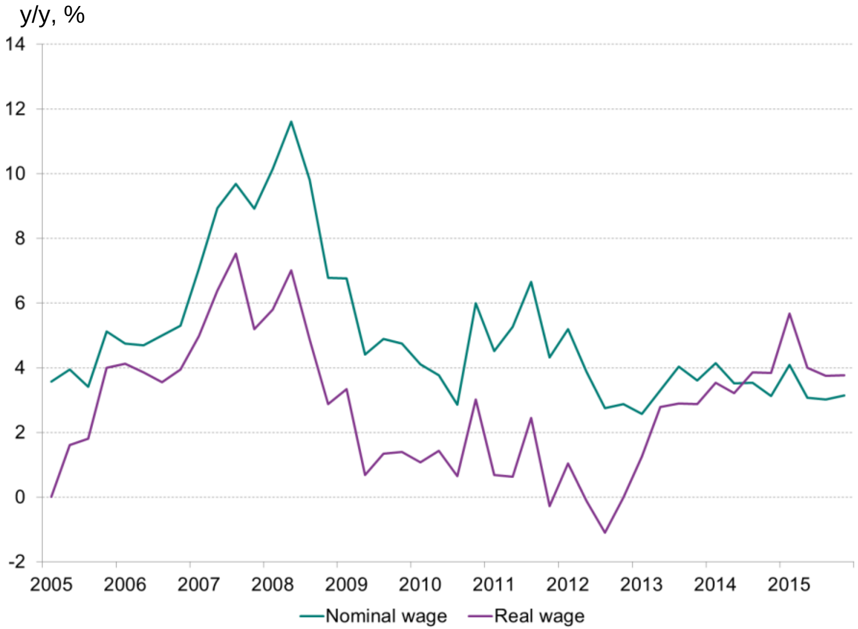
Values from the November projection are given in brackets (seasonally adjusted).
Indicators with values higher than in the November projection are marked green, whereas indicators with lower values are marked red.

The robust labour market is curbing the risk of a liquidity trap

Unemployment



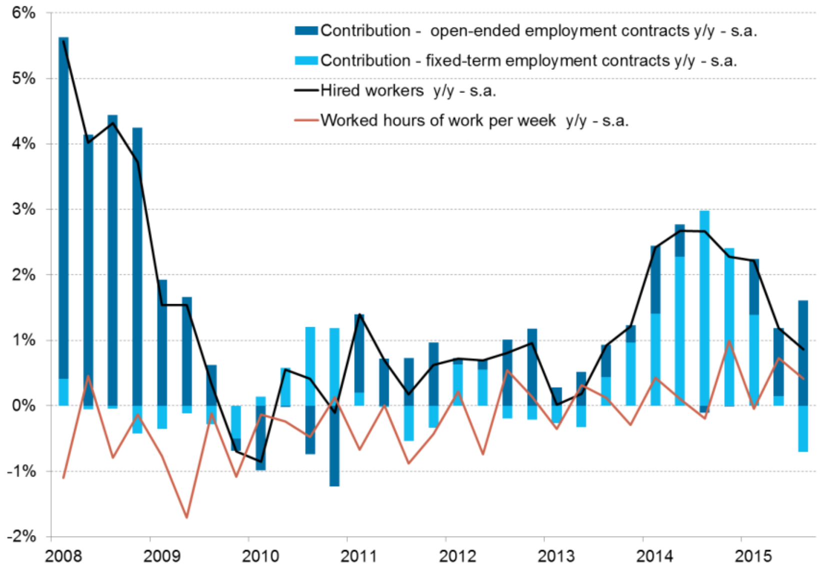
Wages



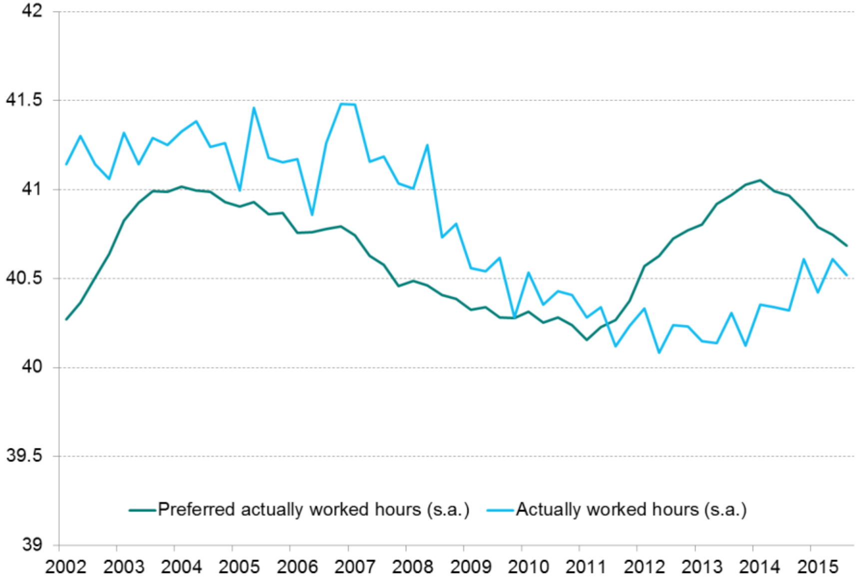
Source: CSO data, NBP calculations

The robust labour market is curbing the risk of a liquidity trap (2)

Wage growth in the economy and the impact of changes in workforce structure (s.a.)



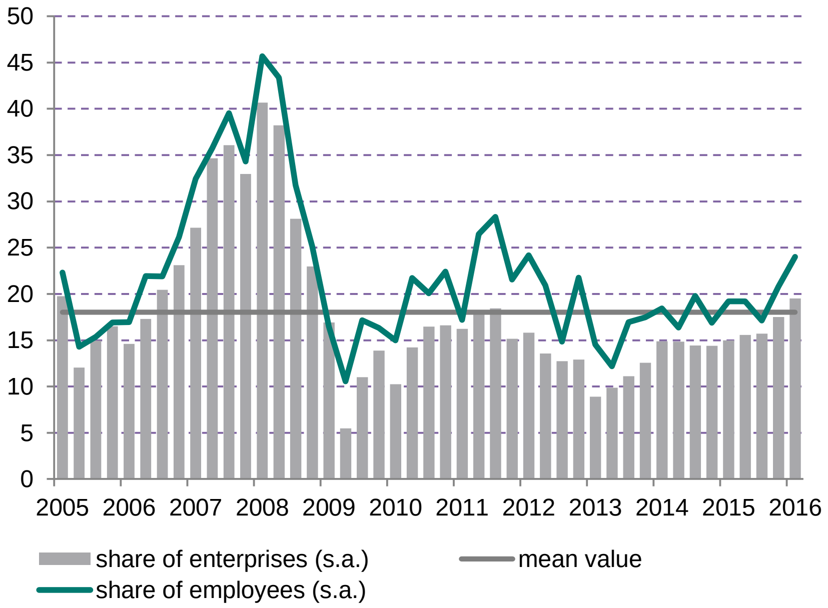
Preferred vs. actually worked hours of work per week (s.a.)



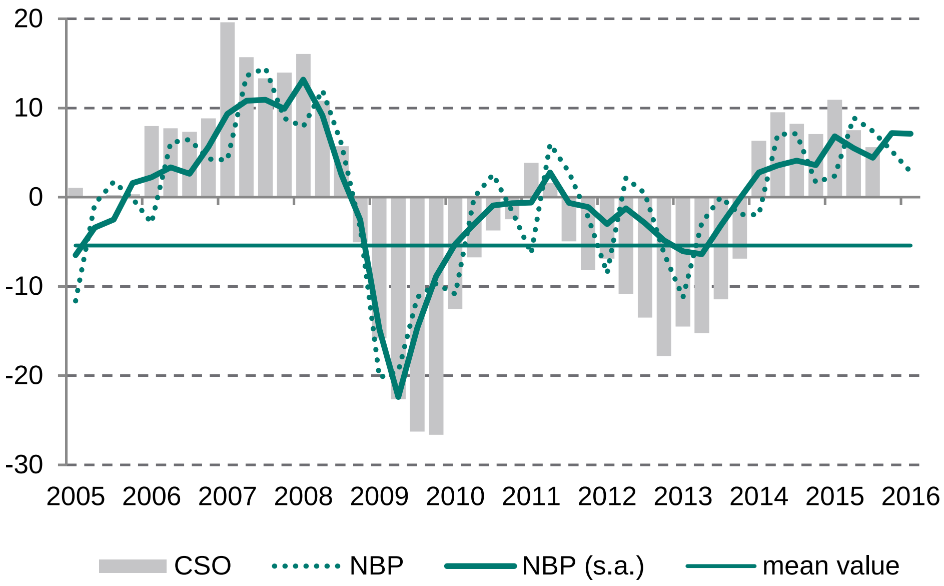
Source: CSO data, NBP calculations

The robust labour market is curbing the risk of a liquidity trap (3)

Percentage of firms planning to raise wages and percentage of employees having received a rise

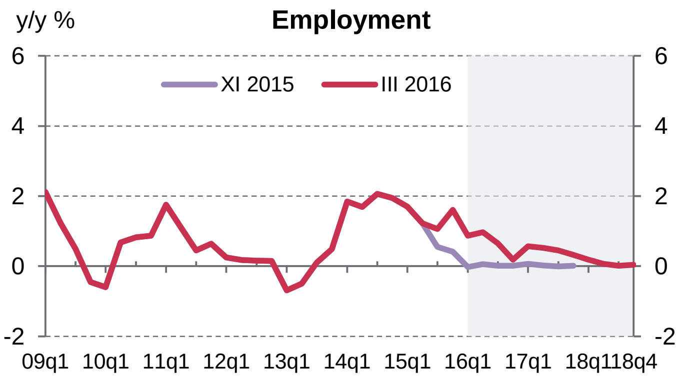


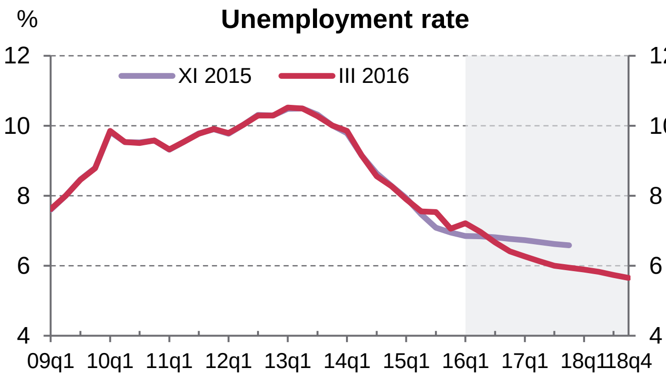
Employment forecast indicator

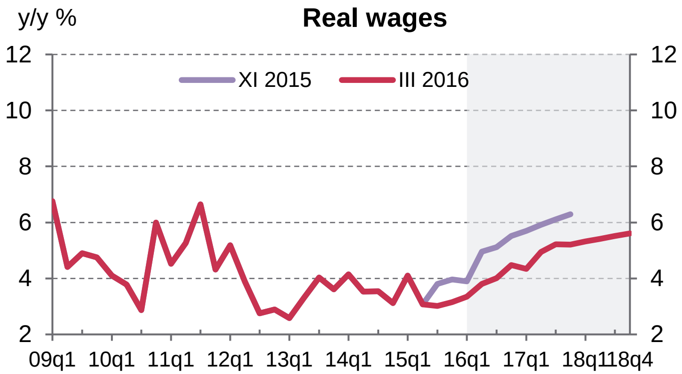


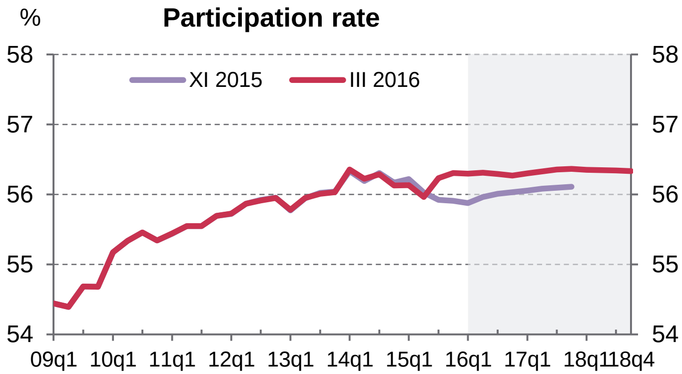
Source: NBP Quick Monitoring Survey

Labour market





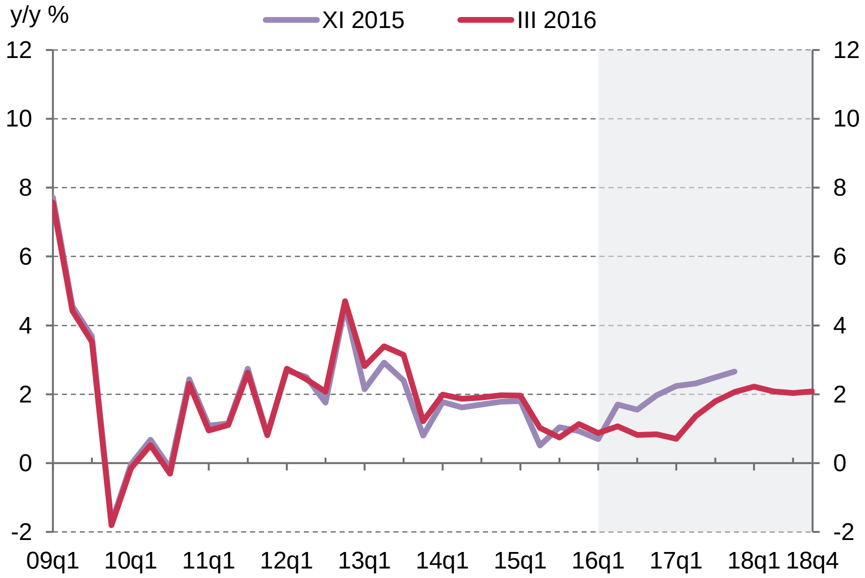




Source: CSO data, NBP calculations

Unit labour cost

Unit labour cost (ULC)
(lower)



Source: CSO data, NBP calculations

Outline:

Changes between rounds

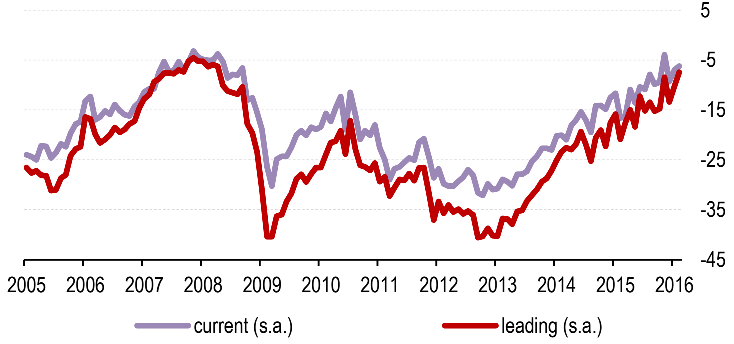
Projection 2016 - 2018

Uncertainty

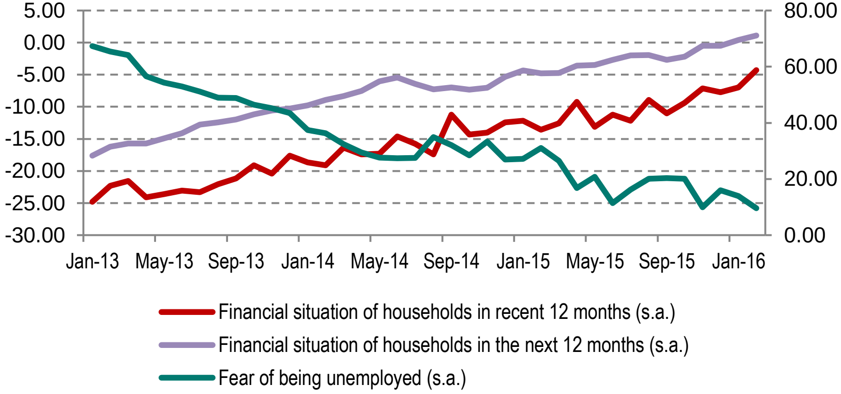
Consumption demand

Consumer sentiment

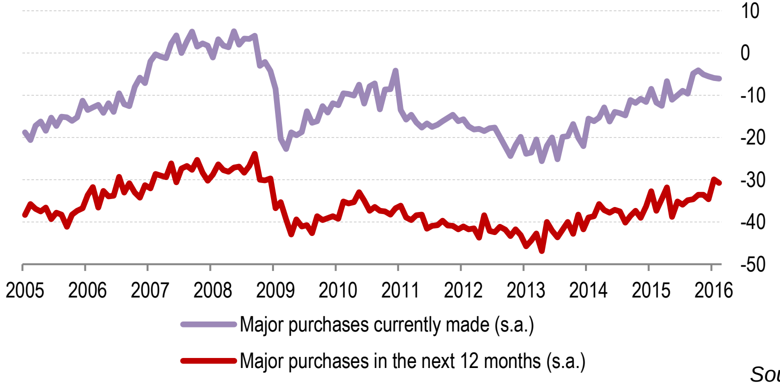
Consumer confidence indicators



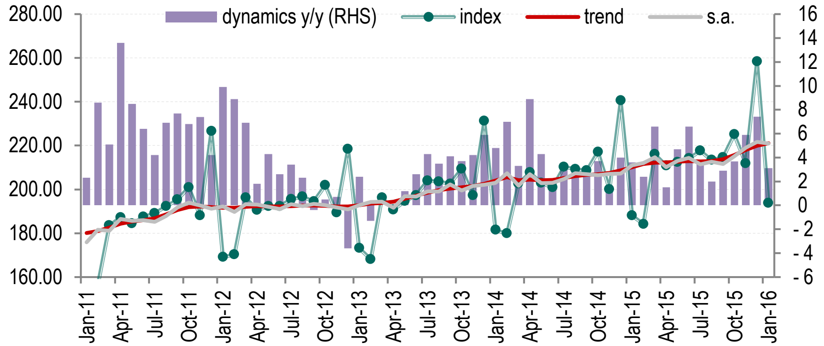
Past and future financial situation of households



Current purchases and intentions of purchases



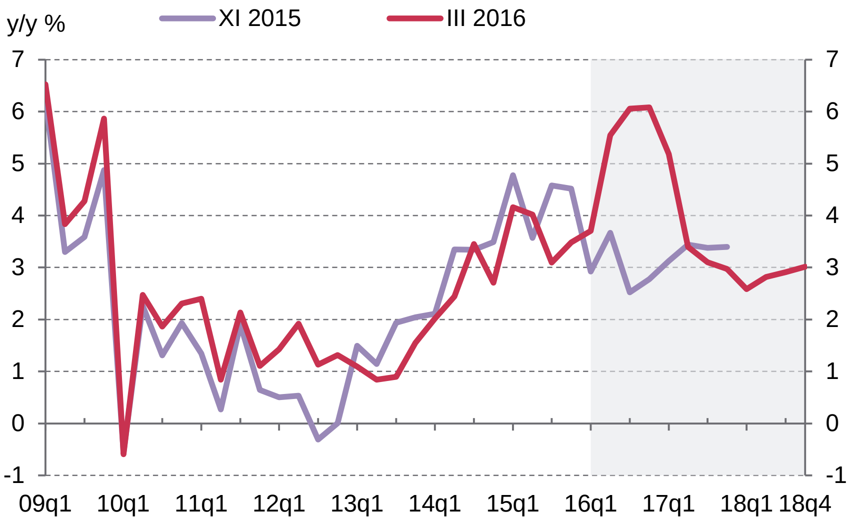
Retail sales



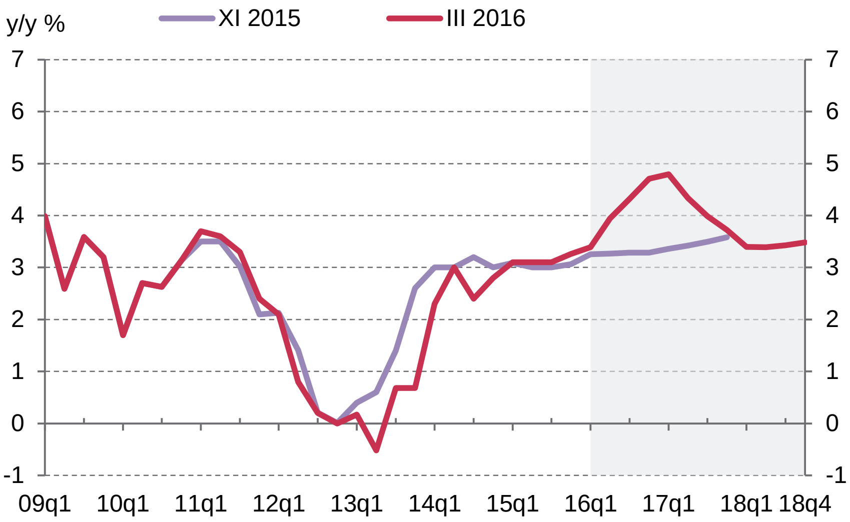
Source: NBP

Consumption demand

Real gross disposable income
(higher in short horizon;
data revision, programme „Rodzina 500 plus”)



Individual consumption
(higher in short horizon)



Source: CSO data, NBP calculations

Outline:

Changes between rounds

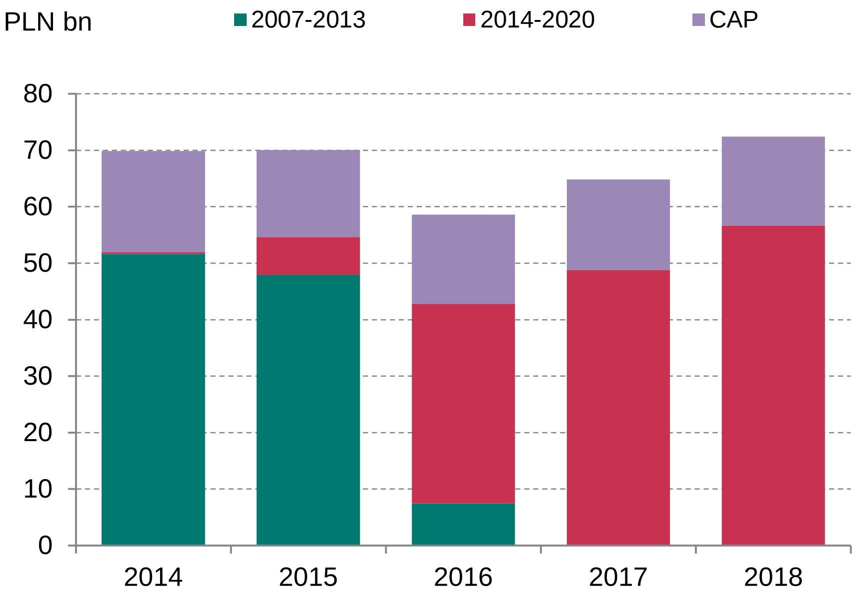
Projection 2016 - 2018

Uncertainty

General government expenditure

Utilisation of EU funds

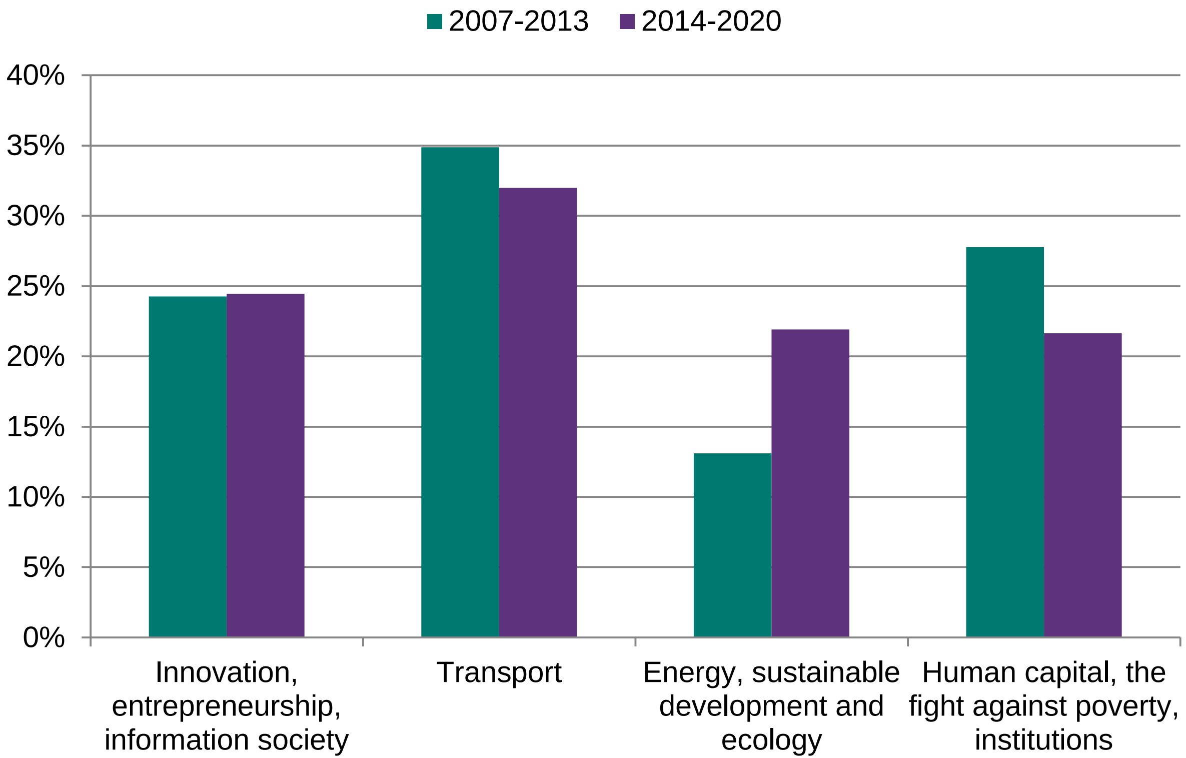
Utilisation of EU funds by financial perspective



Source: NBP estimates based on MIR data*

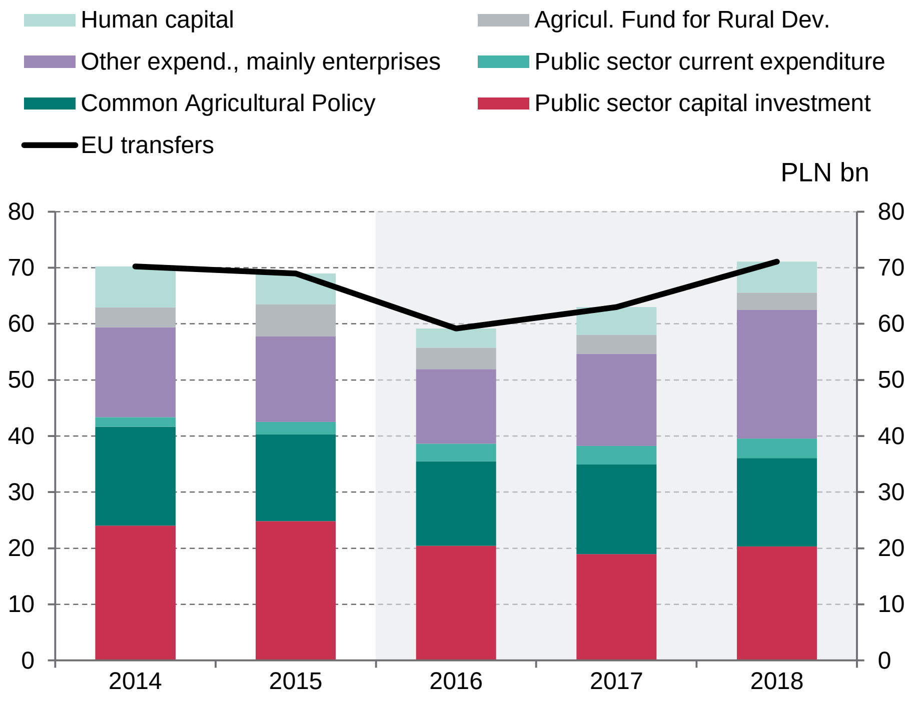
- In 2016 absorption of EU funds under the 2007-2013 financial framework will come to an end.
- The experience of the 2007-2013 financial framework suggests that the absorption of funds under the 2014-2020 framework will take off only gradually.
- Higher public investment growth is expected in 2017-18 – comprising, in particular, projects implemented by local government units (under regional programmes), as well as transportation investment.

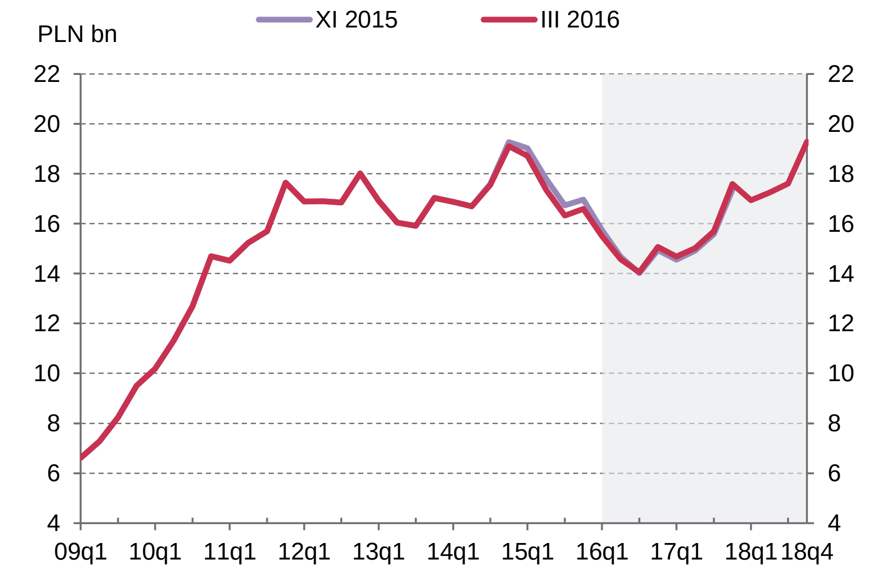
Allocation of EU funds from both financial perspectives



Source: Ministry of Infrastructure and Development data

EU transfers absorption

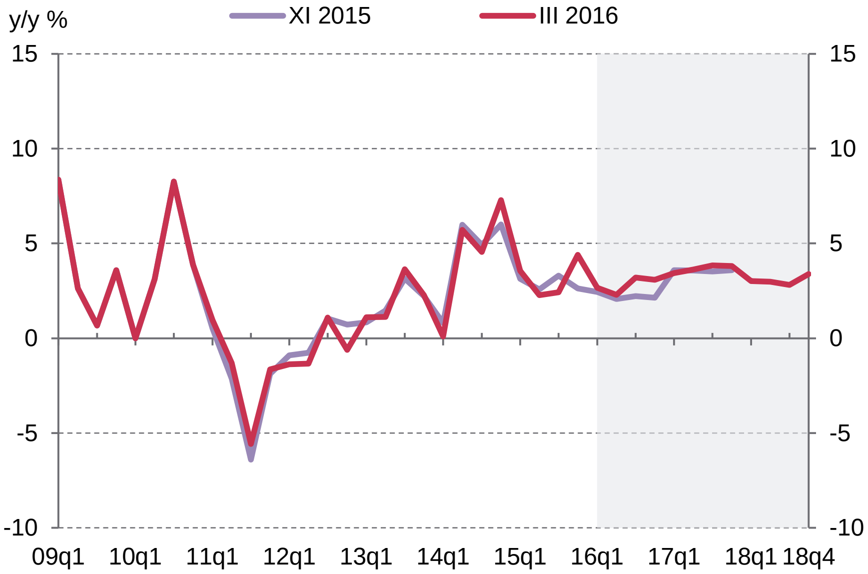




Source: NBP calculations

Public consumption

Public consumption
(lower deflator)



Source: CSO data, NBP calculations

Outline:

Changes between rounds

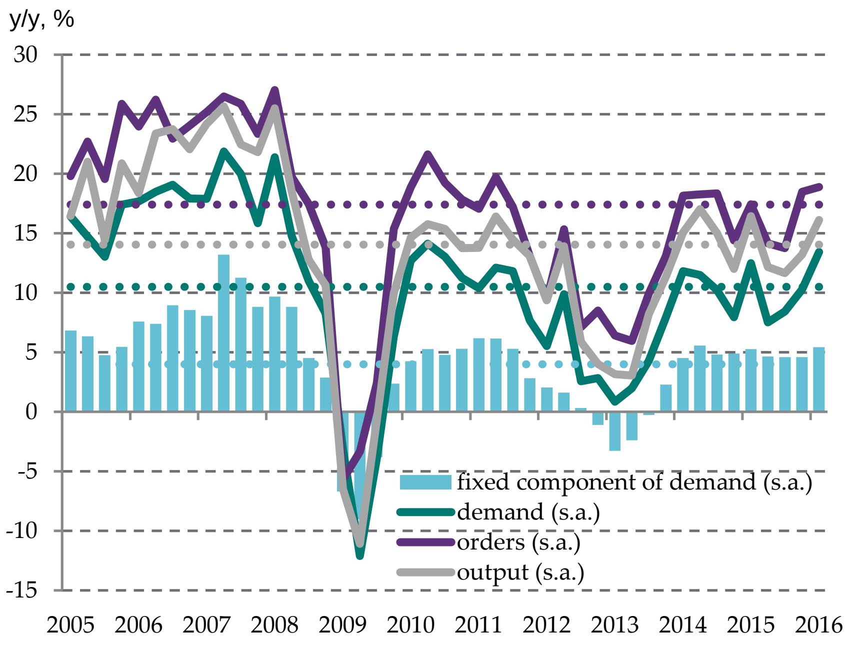
Projection 2016 - 2018

Uncertainty

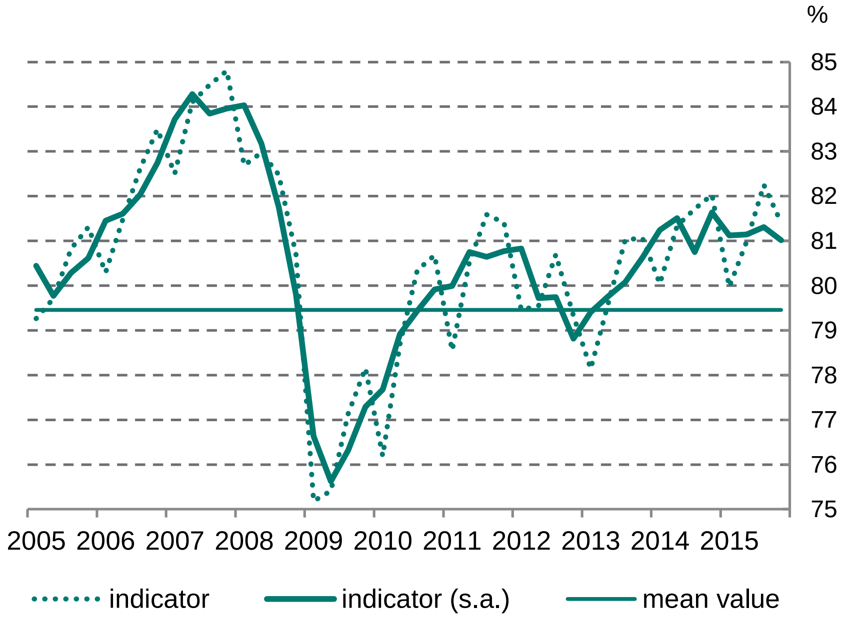
Investment demand

Investment demand

Forecast of demand, output and orders (s.a.)



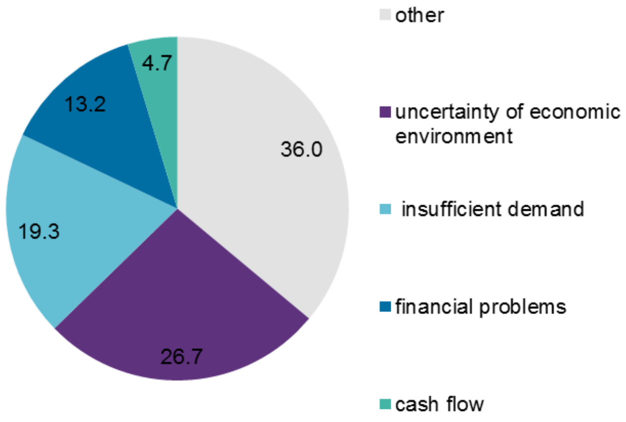
Capacity utilisation



Source: NBP Quick Monitoring Survey, CSO

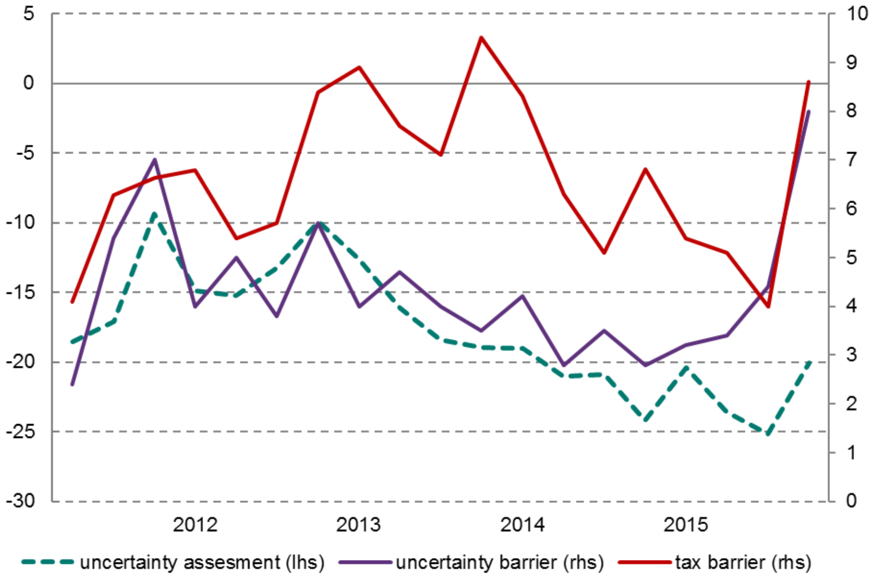
Economic situation

Reasons for absence of investment plans in a one-year horizon



(% of firms not planning to launch new investment projects, excluding cases where no need for investment was stated)

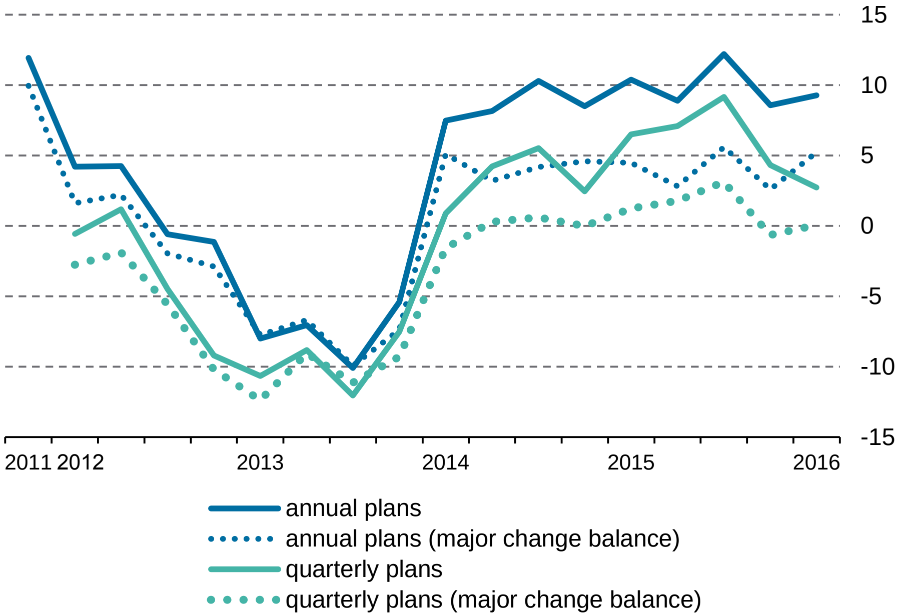
Assessment of the uncertainty of the situation



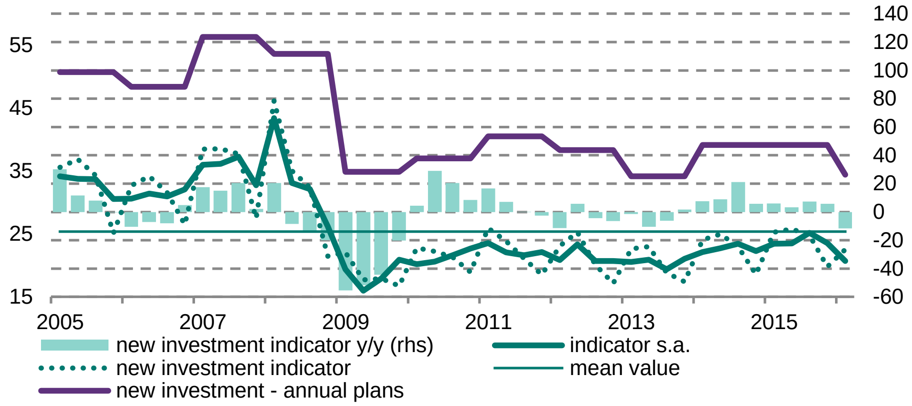
Source: NBP Quick Monitoring Survey

Investment outlays of enterprises

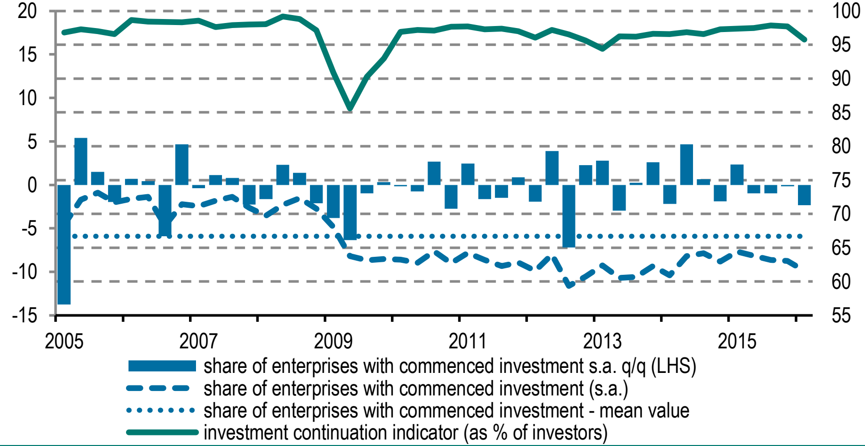
Planned changes in investment outlays within a quarter and in the current year, y/y



New investment indicator (share of enterprises planning to commence new investment within a quarter and the year)

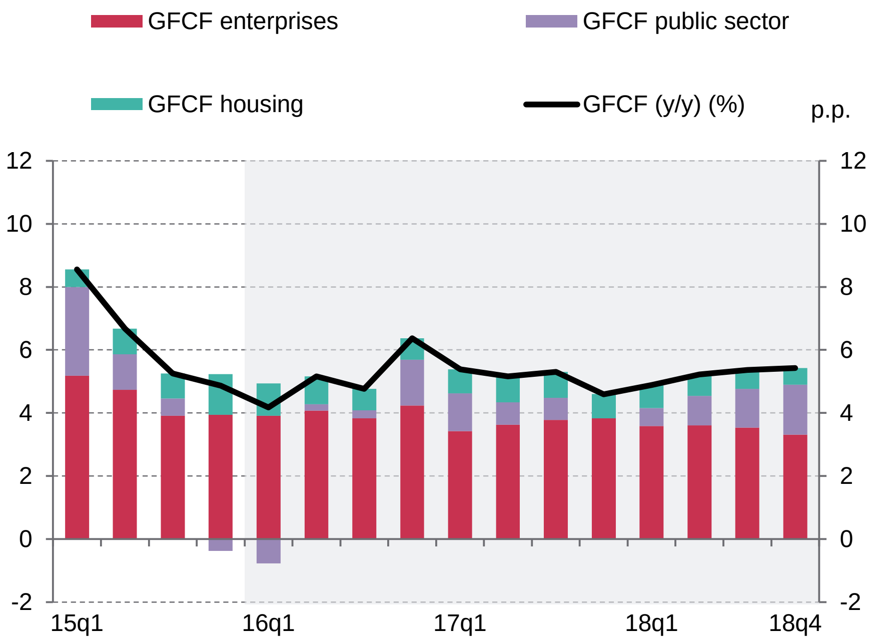


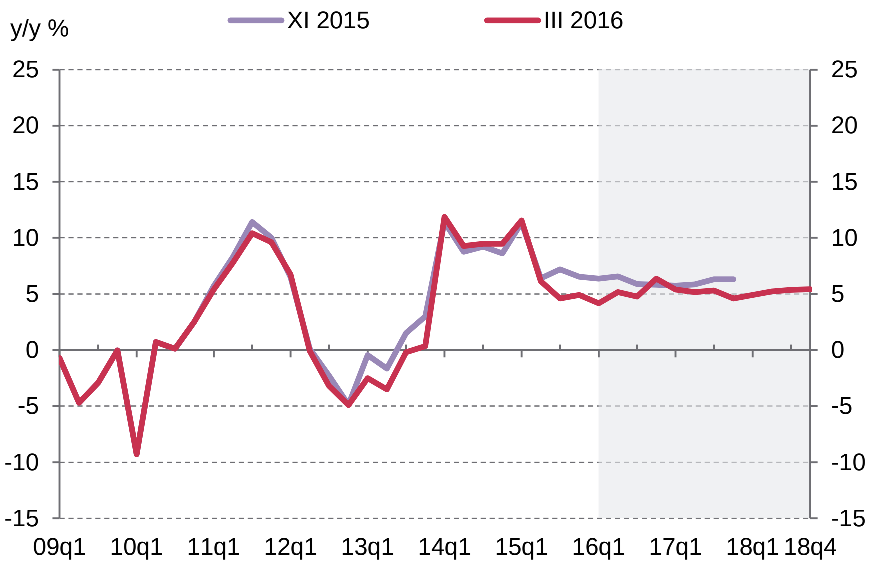
Continuation of commenced investments



Source: NBP Quick Monitoring Survey

Gross fixed capital formation
(lower)





Source: CSO data, NBP calculations

Outline:

Changes between rounds

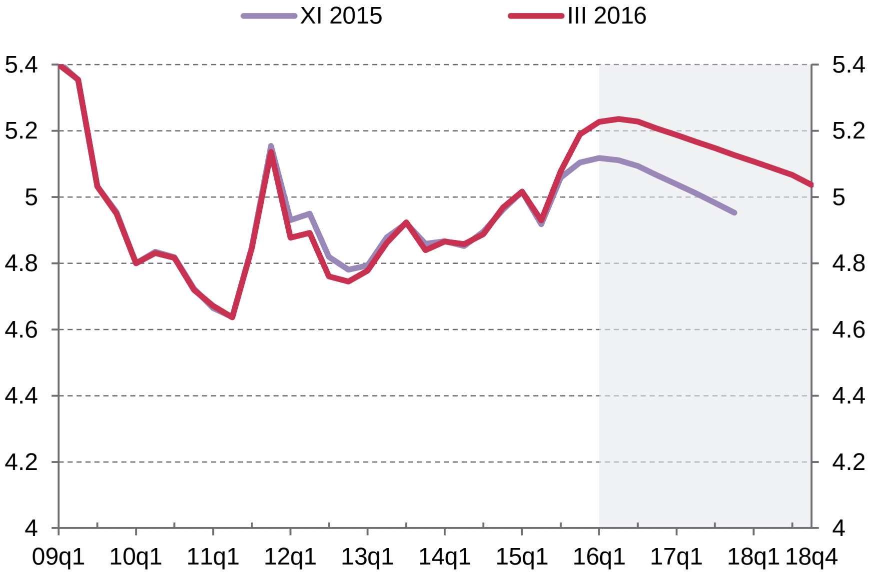
Projection 2016 - 2018

Uncertainty

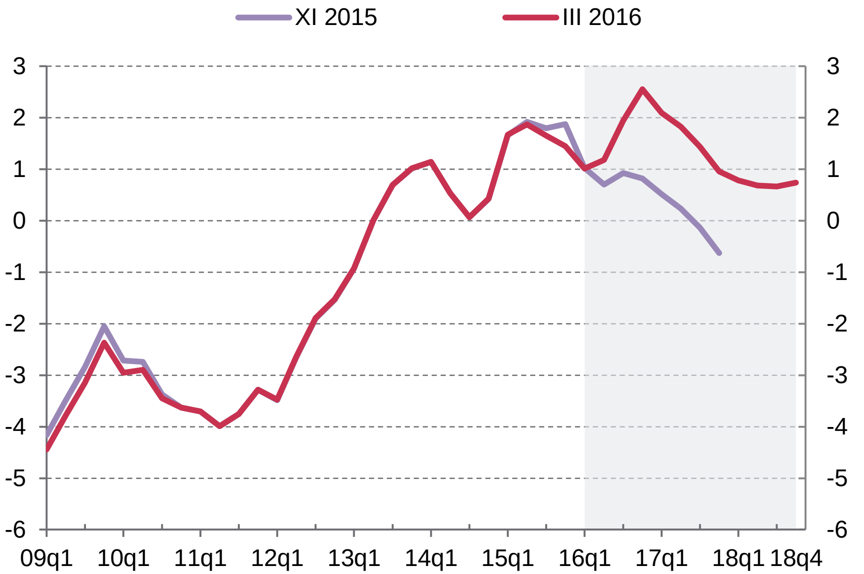
Foreign trade

Foreign trade

Real effective exchange rate (REER)
(weaker)



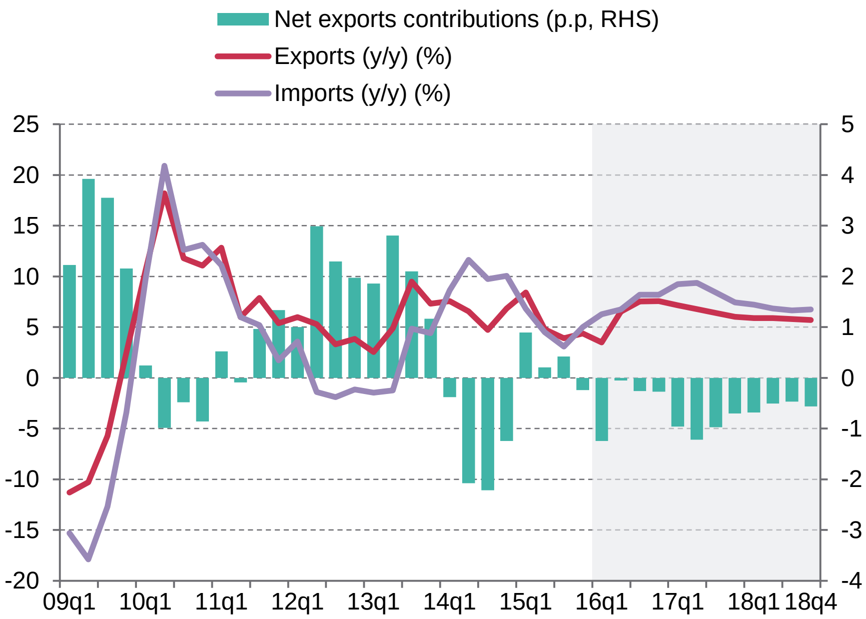
Current account balance (% GDP)
(higher)

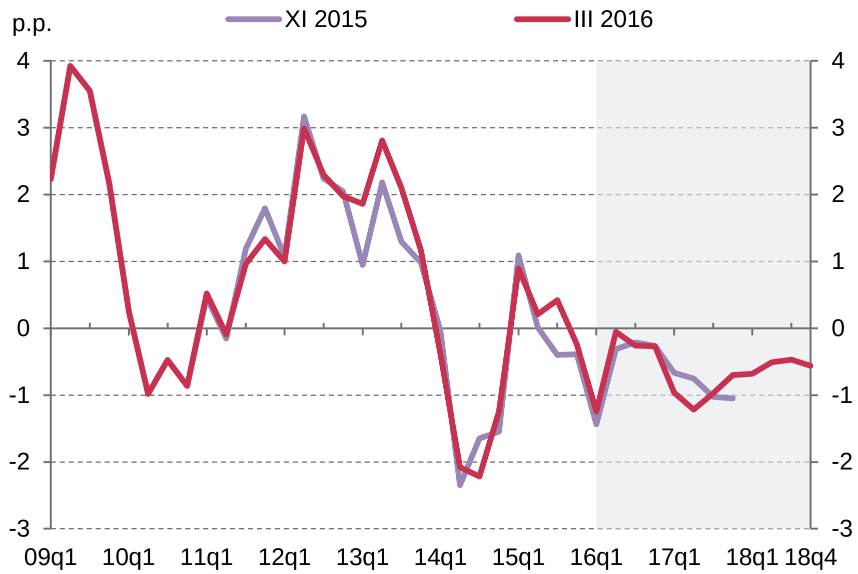


Source: NBP, Bloomberg data, NBP calculations

Net exports contributions

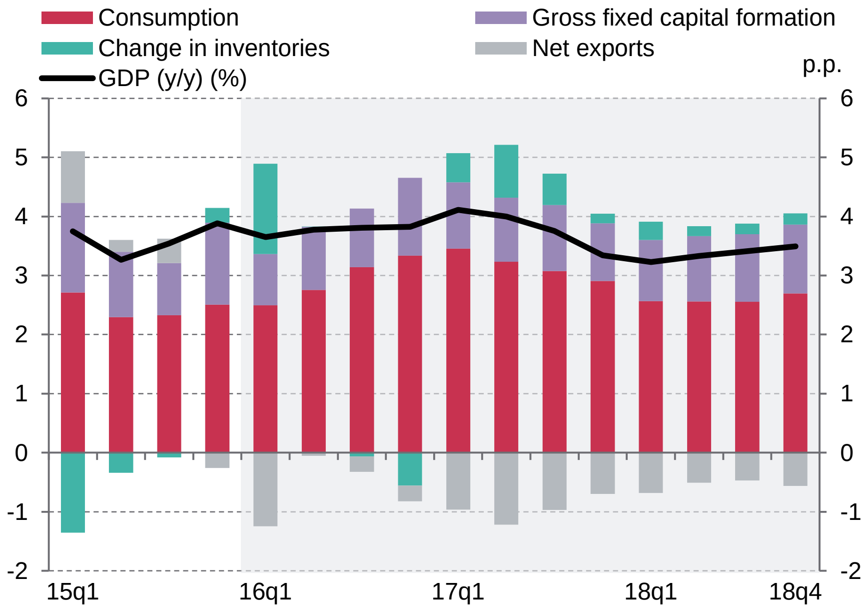
(lower in 2017)

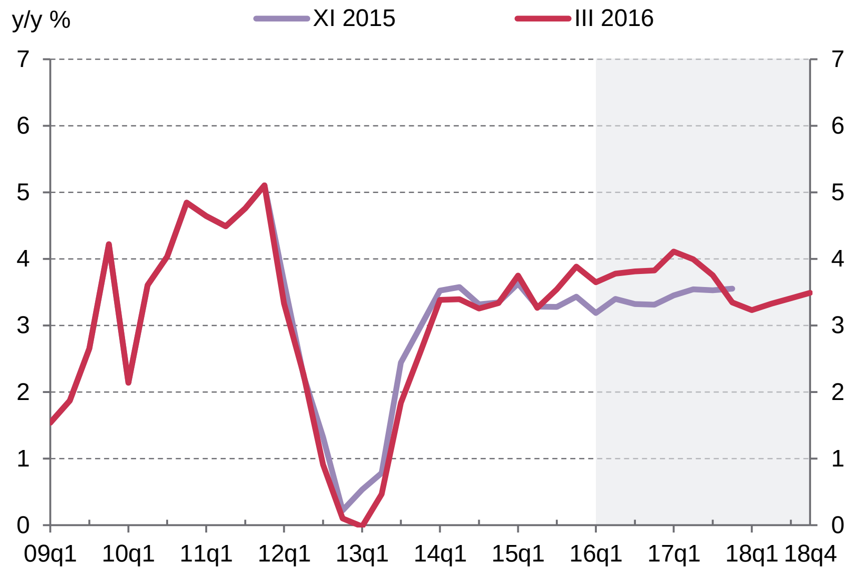




Source: CSO data, NBP calculations

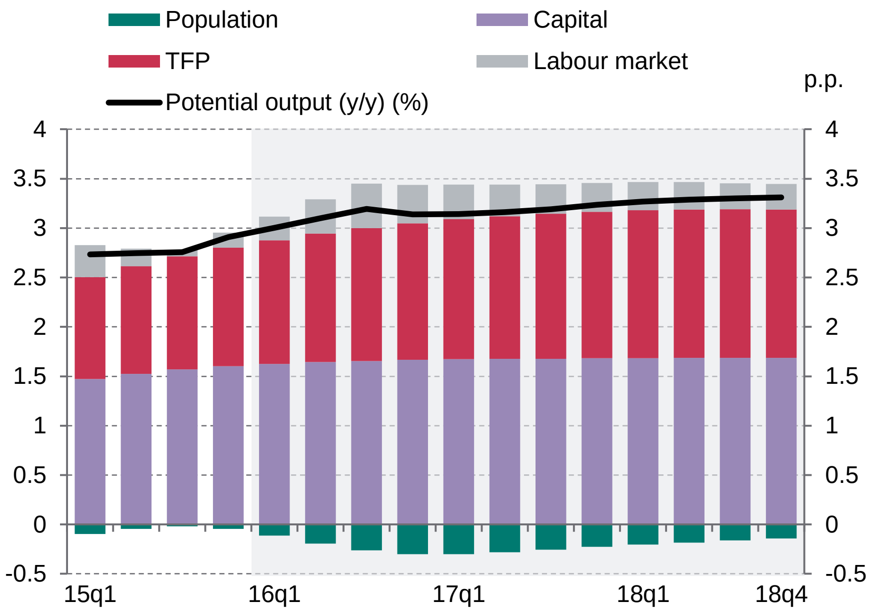
GDP
(higher)

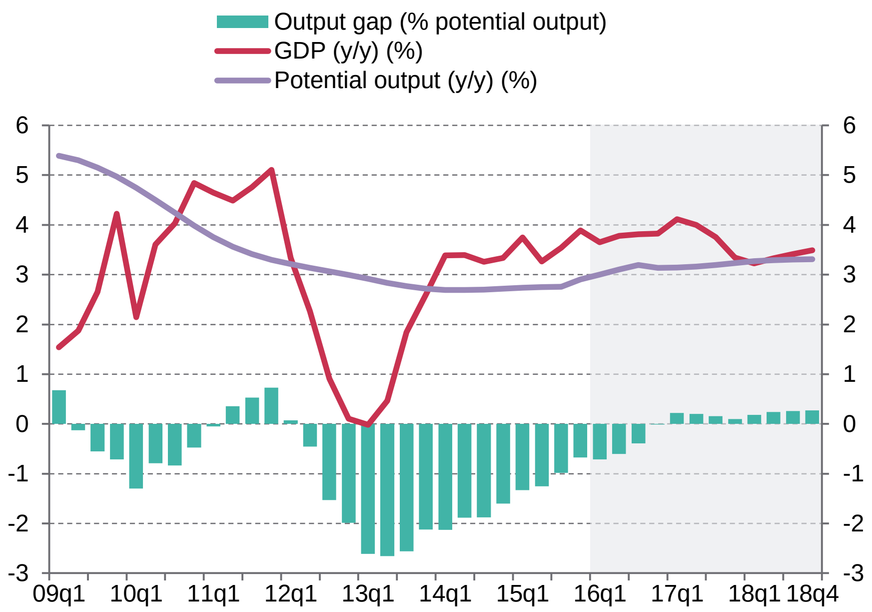




Source: CSO data, NBP calculations

Potential output





Source: NBP calculations

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

Inflation

CPI inflation – 2015Q4

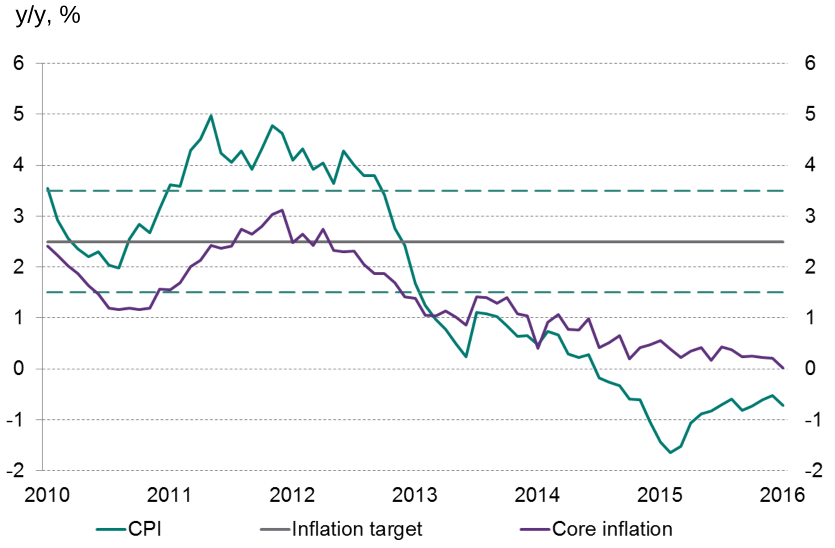
	15q4	
CPI inflation (y/y) (%)	-0.6	(-0.2)
Core inflation (y/y) (%)	0.2	(0.4)
Food prices inflation (y/y) (%)	0.1	(1.1)
Energy prices inflation (y/y) (%)	-4.5	(-4.0)

Source: CSO data, NBP calculations

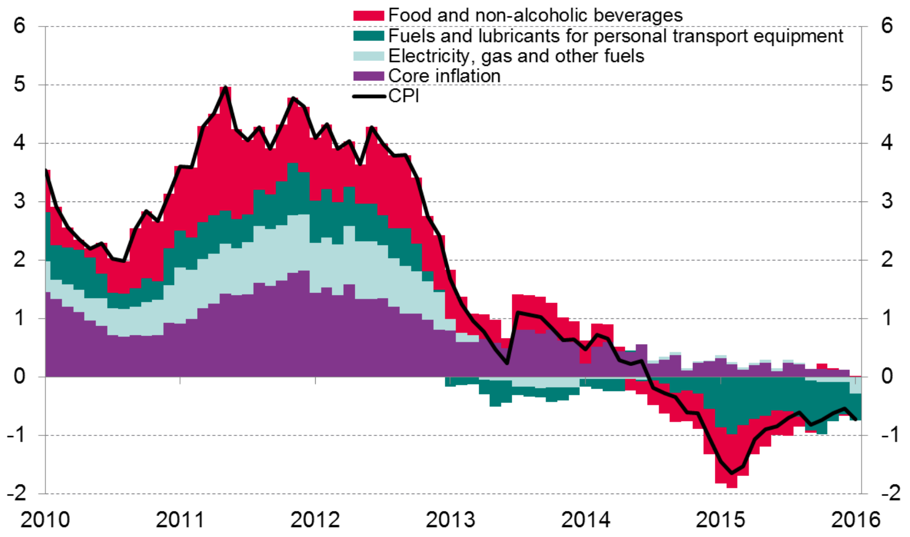
Values from the November projection are given in brackets (seasonally adjusted).
Indicators with values higher than in the November projection are marked green, whereas indicators with lower values are marked red.

Deflation in Poland mainly due to energy and food prices

CPI inflation



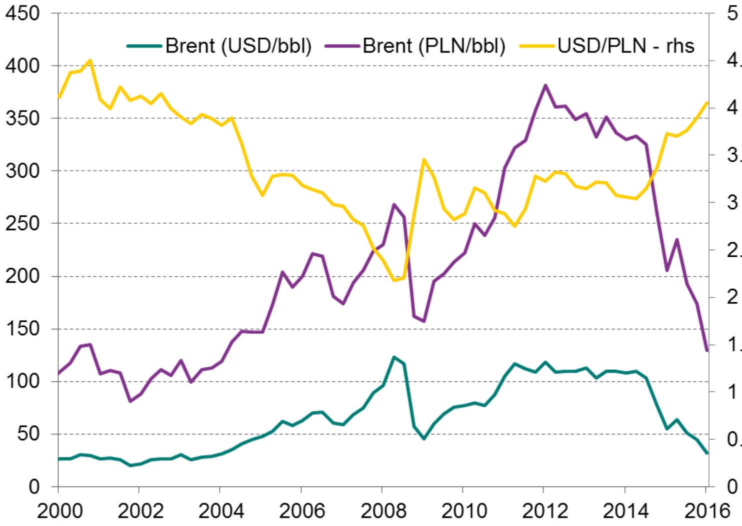
CPI (y/y, %) - breakdown



Source: CSO data, NBP calculations

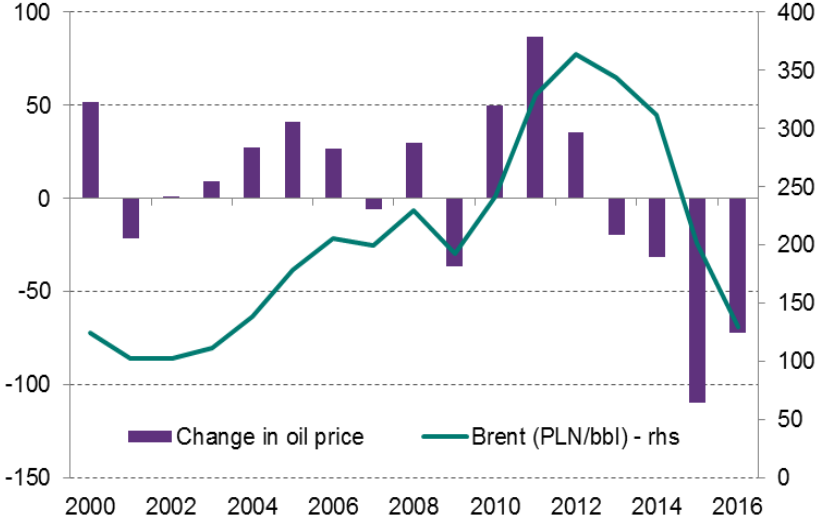
Impact of oil prices on CPI inflation

Brent oil prices in USD and PLN



- The extent of declines in oil prices in USD in 2014-2015 is close to that of 2009
- The current decline in the PLN prices is much sharper due to a smaller depreciation of the zloty vis-a-vis the dollar than in 2009

Change in Brent oil prices in PLN

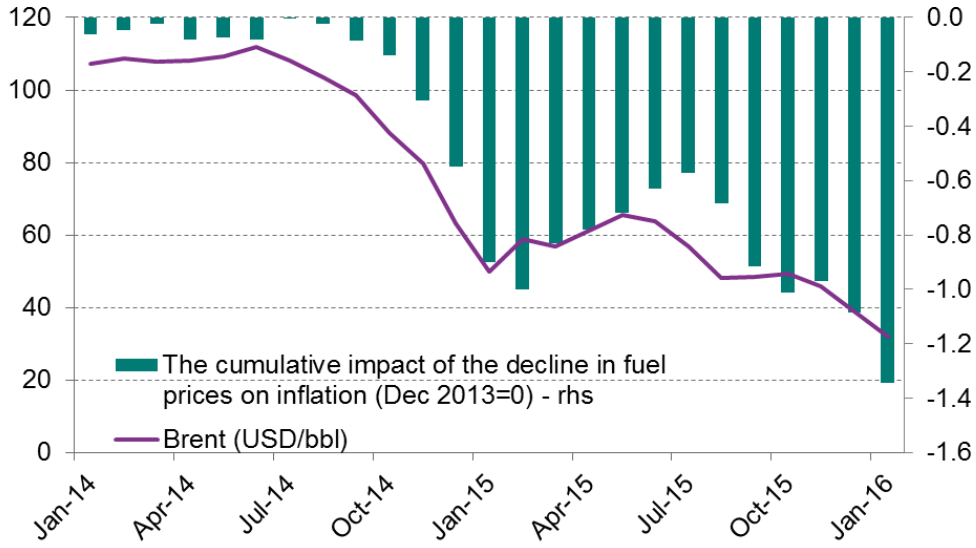


- There were record slumps in PLN oil prices in 2014 and 2015.

Source: Bloomberg, NBP calculations

Impact of oil prices on CPI inflation (2)

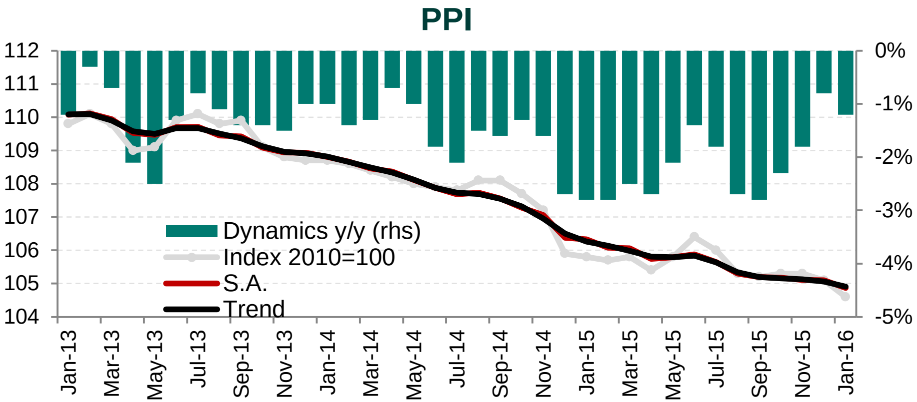
Impact of changes in fuel prices on CPI

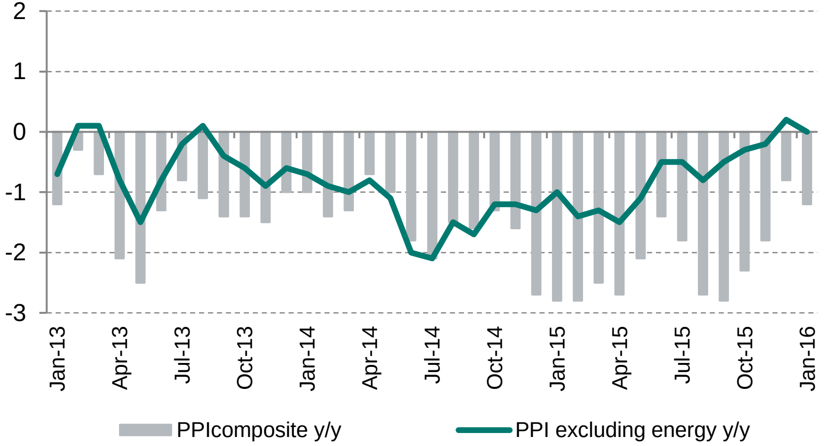


Source: Bloomberg, NBP calculations

- The cumulative impact of the decline in fuel prices on inflation: - 1.3 p.p.
- Yet this figure does not account for the indirect effects, such as a decline in transportation costs or in prices of natural gas. These prices respond to changes in oil prices with a lag of a few quarters.

Sustained downward trend in PPI index



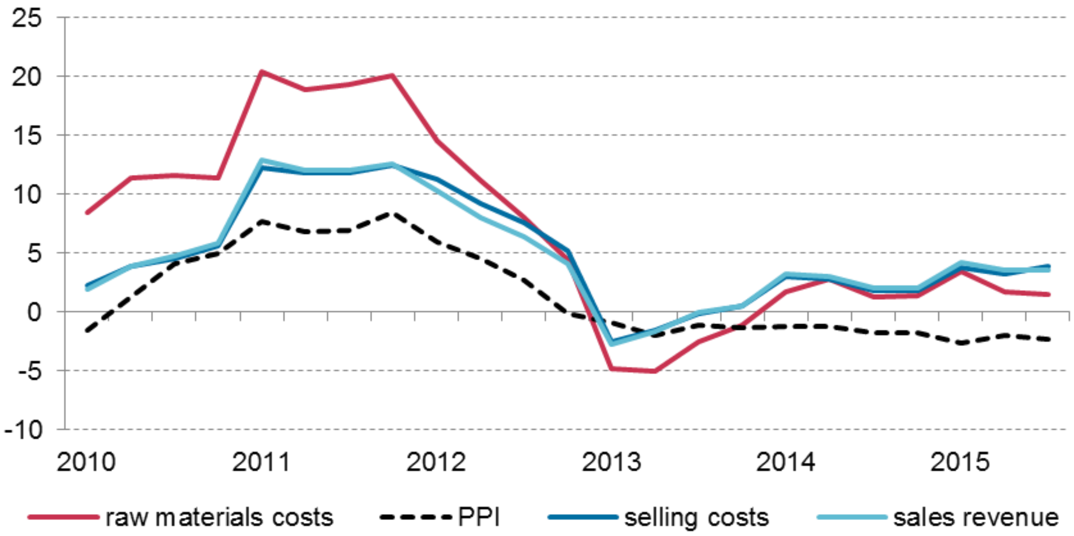


- Following four months of stabilisation, in January 2016 producer prices renewed their downward trend dating back to May 2012.
- In annual terns, producer price growth dropped by 0.4 p.p. in January, hitting the level of -1.2% y/y.
- Producer prices have been falling primarily on the back of further declines in commodity price quotations, especially those of oil, in the global markets.
- The greatest contribution to the annual change in total PPI is generated by manufacturing (-0.3 p.p.), mainly due to the decline in the prices of production of coke and oil refinery products. The energy sector is the next one to contribute to the change (-0.2).
- PPI net of goods related to energy stood at a level last observed in January 2015, which means a stabilisation of prices in this sector of industry.

Source: CSO, NBP

Slow corporate cost growth

Cost and sales growth vs. change in PPI

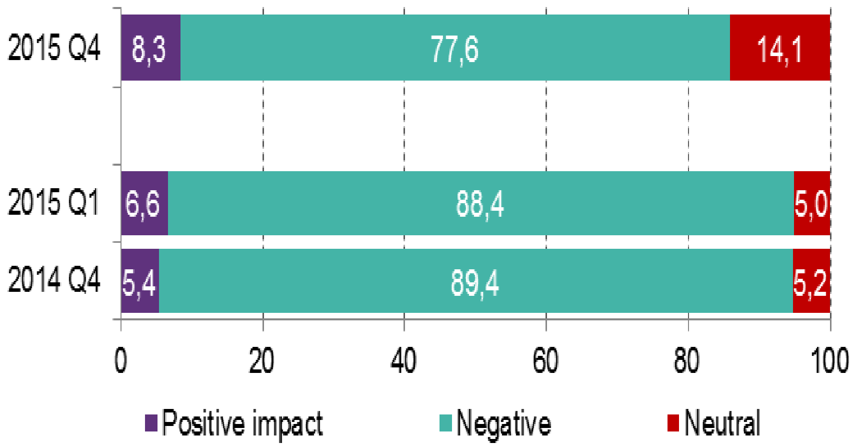


Lower commodity prices help keep cost growth relatively slow

Source: F-01/01 CSO reporting

Impact of price declines on the situation of enterprises

Impact of decline in producer prices on firms' economic situation

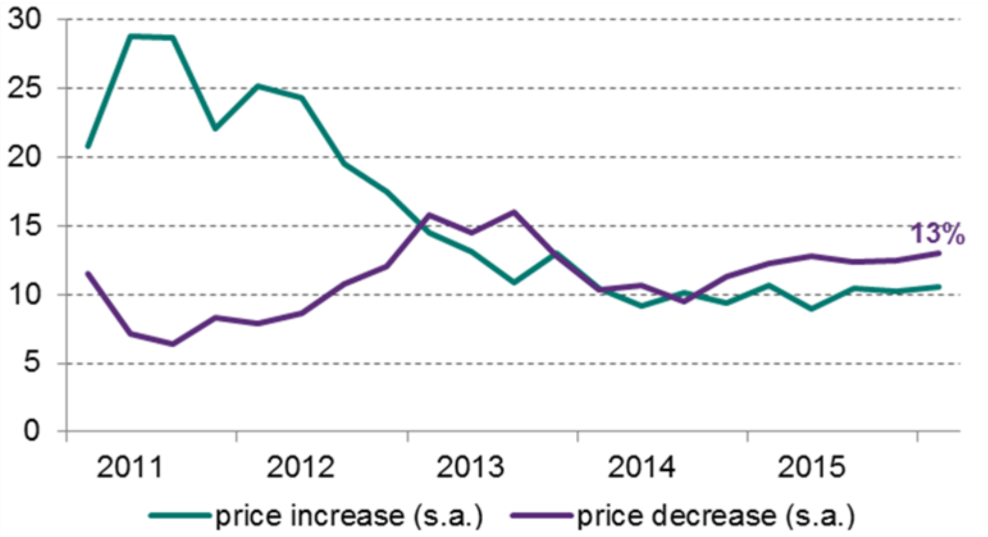


Source: NBP Quick Monitoring Survey

- In 2015 Q4, more than 3/4 of firms assessed the impact of the decline in producer prices as insignificant to their situation (in terms of the net impact on costs and revenue)
- During the year, the frequency of negative assessments of the impact of PPI price declines increased – in Q4 they outstripped the positive assessments.
- The negative impact is related to the markedly more frequent declarations of the need to reduce prices.

Impact of price declines on the situation of enterprises (2)

Percentage of firms having raised or reduced prices

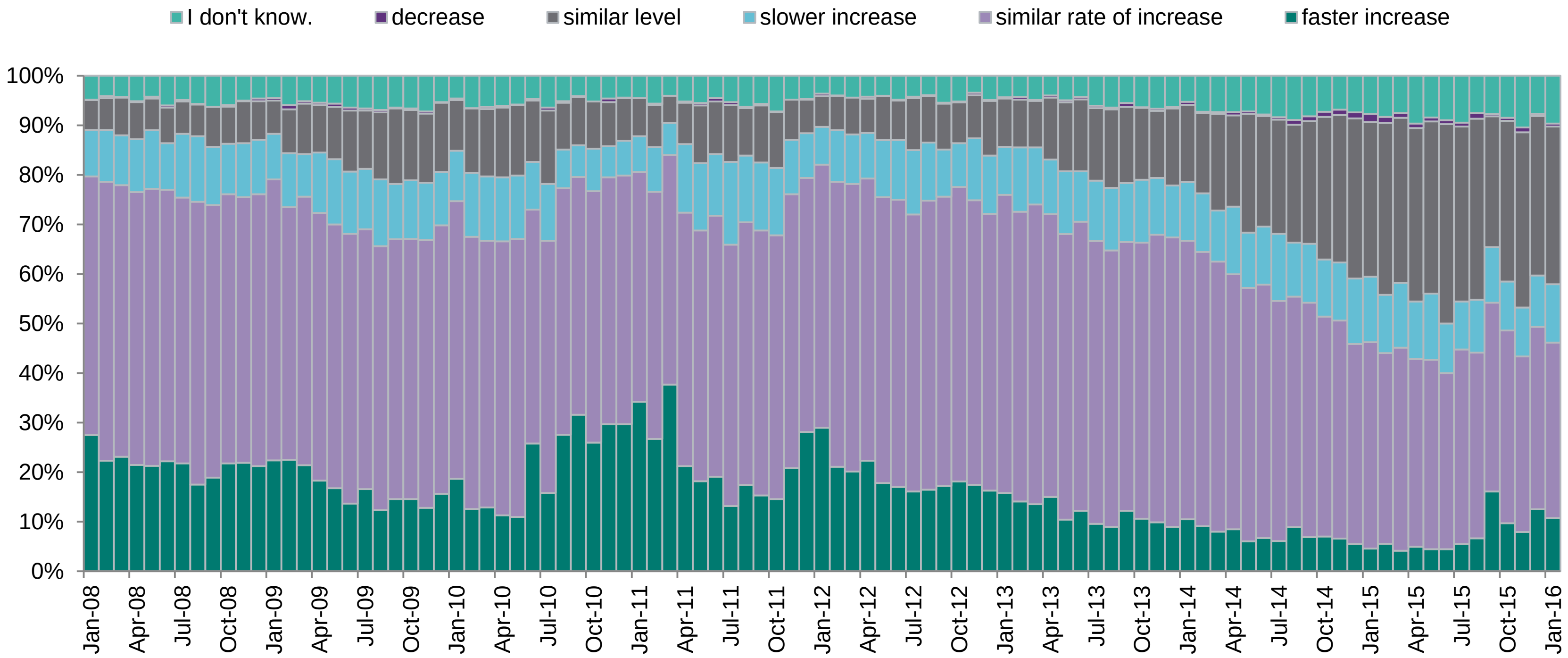


Source: NBP Quick Monitoring Survey

- The adverse effects of deflation are most often observed by firms forced to reduce their prices
- Among the firms having reduced their prices, 43% consider the decline in PPI as adverse; in the remainder group the figure is 9%.

Inflation – consumer expectations

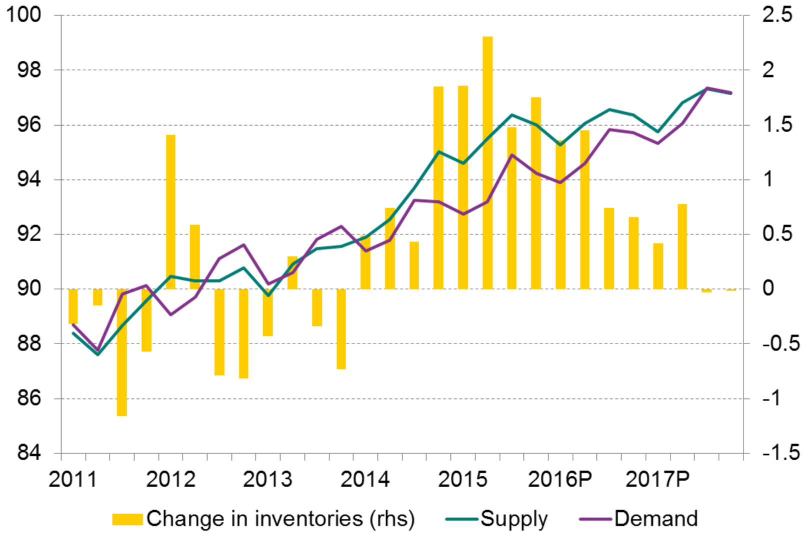
As compared to the recent 12 months, what changes in consumer prices (goods and consumer services) do you expect in the coming 12 months ?



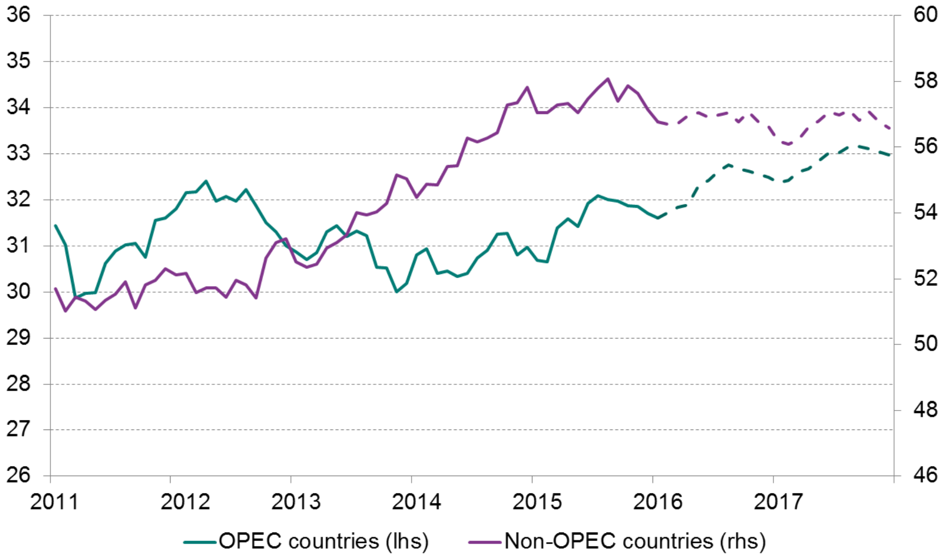
Source: NBP

Situation in the oil market

World oil supply and demand and changes in inventories of oil (million b/d)



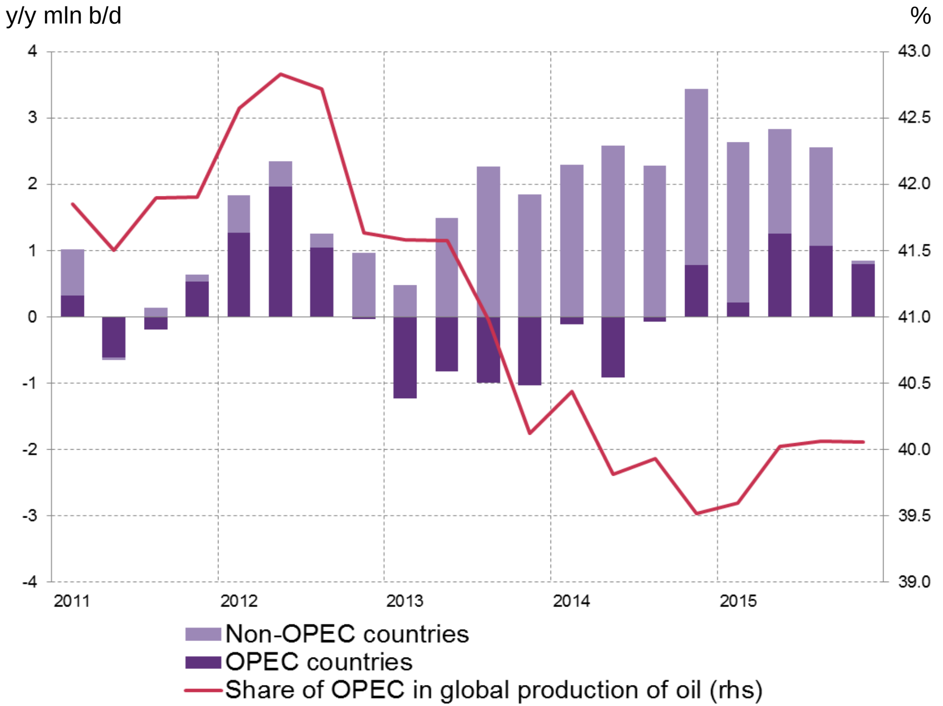
Oil production in OPEC and other countries (million b/d)



Dashed lines - forecast

U.S. Energy Information Administration

Changes in oil extraction and share of OPEC in global production of oil

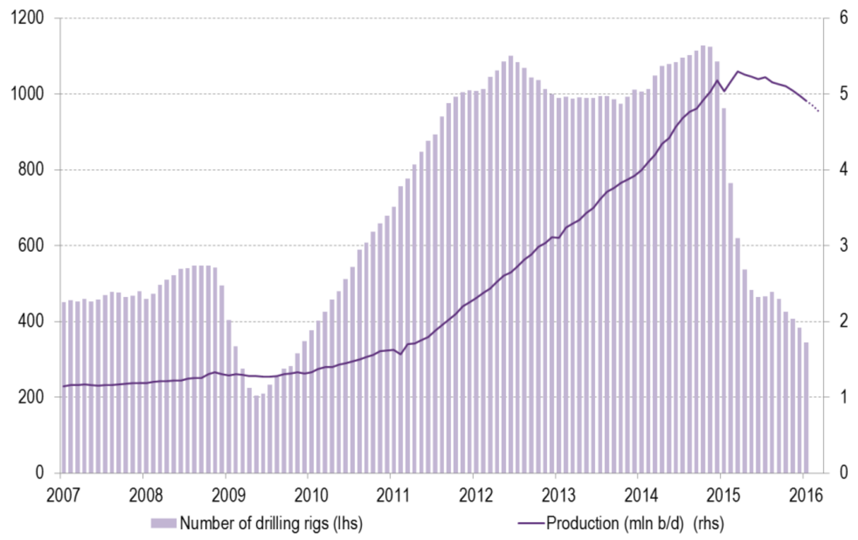


U.S. Energy Information Administration

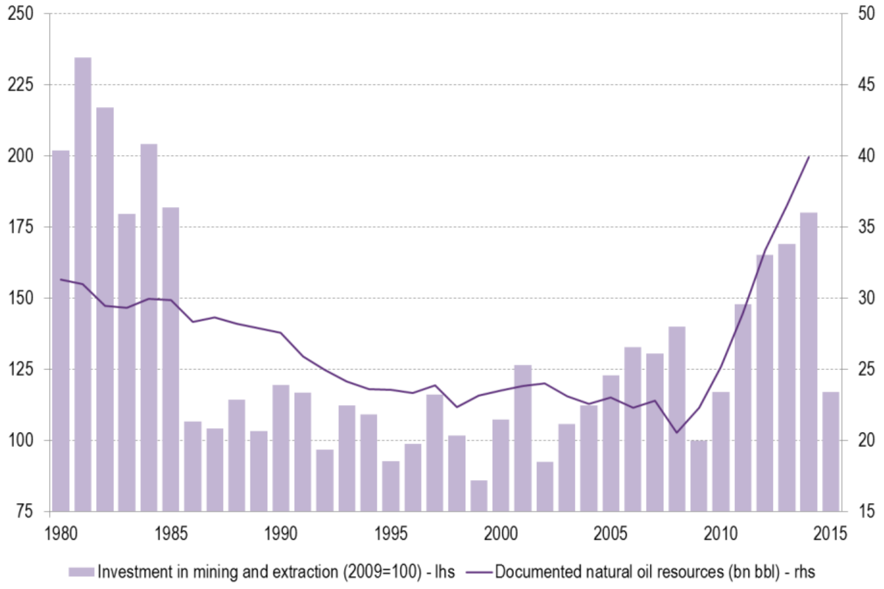
- In December 2015, despite a sharp decline in oil prices which had taken place since the June meeting, OPEC resolved to uphold its share in the market at the expense of unconventional oil producers.

Crude oil supply

Oil extraction (y/y, million b/d) and number of active drilling rigs in four most important regions of shale oil extraction in the USA



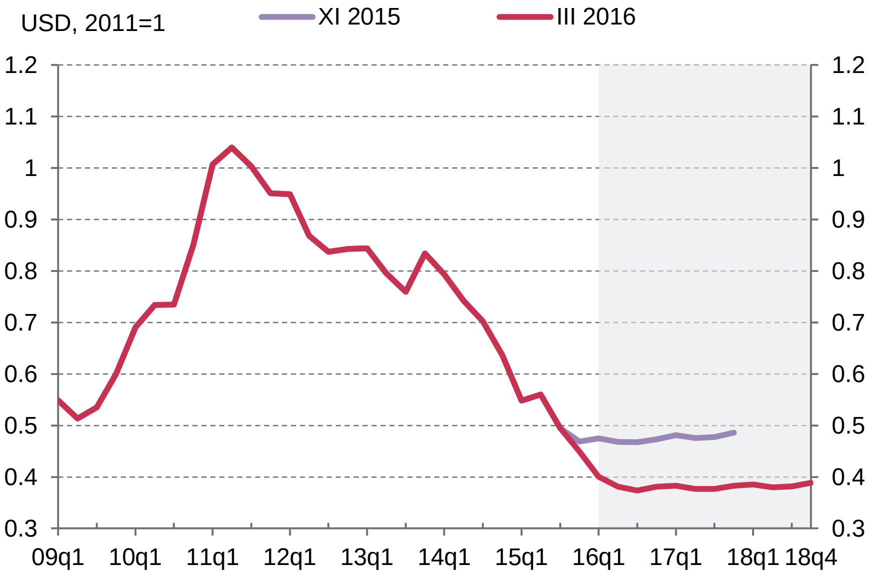
Investment in mining and extraction; documented natural oil resources in the USA



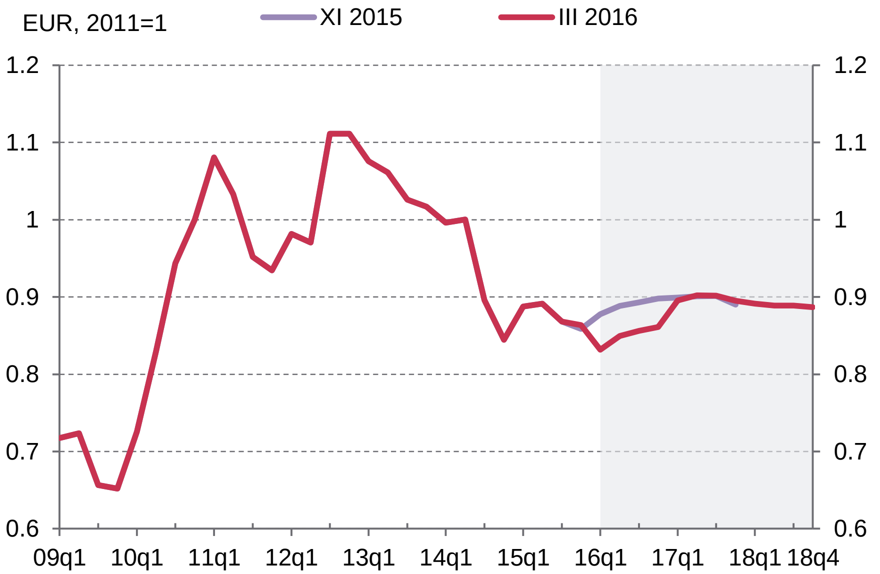
Source: Bureau of Economic Analysis, U.S. Energy Information Administration

Commodity prices

Index of energy commodity prices
(lower)



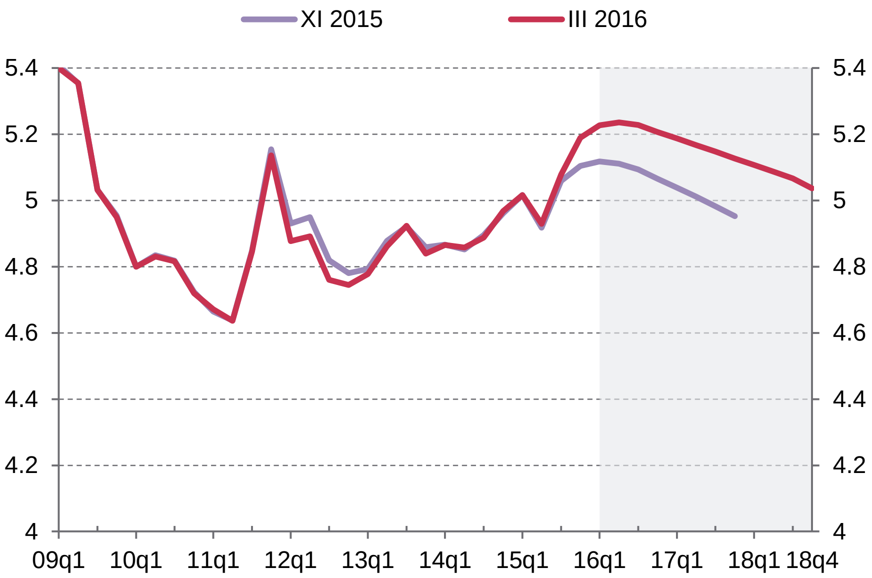
Index of agricultural commodity prices
(lower in short term)



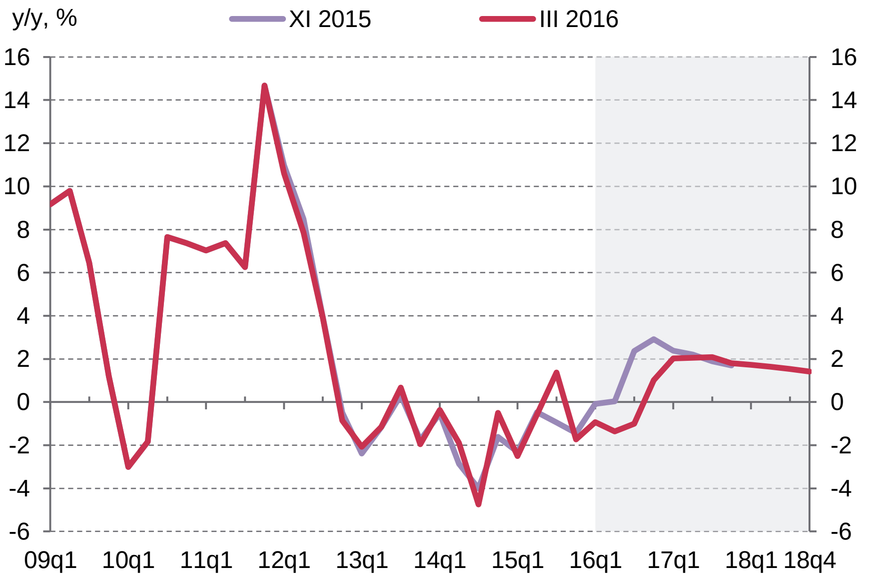
Source: Bloomberg, Reuters data, NBP calculations

Foreign exchange rate and import prices

Real effective exchange rate (REER)
(weaker)



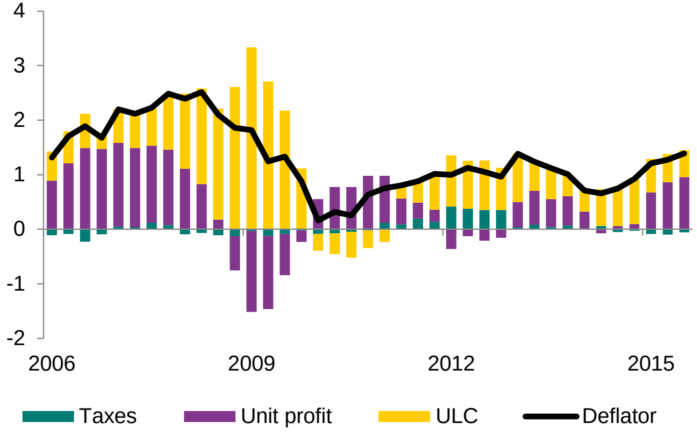
Import prices
(lower in short term)



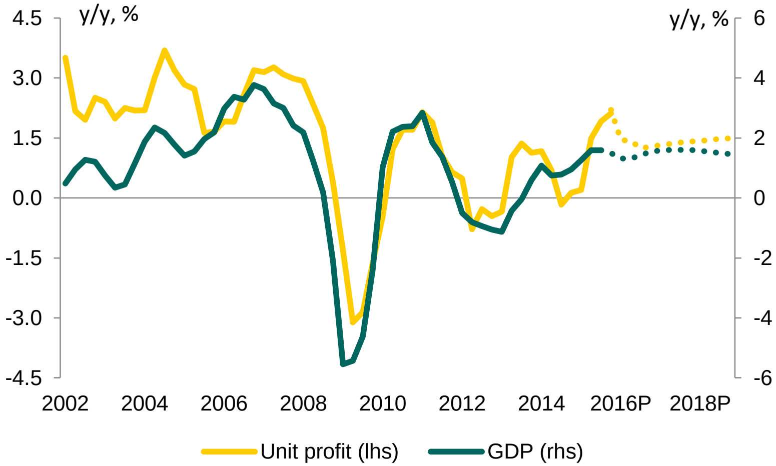
Source: CSO, Bloomberg data, NBP calculations

Inflation in the euro area

Decomposition of the gross value added deflator (p. p.)

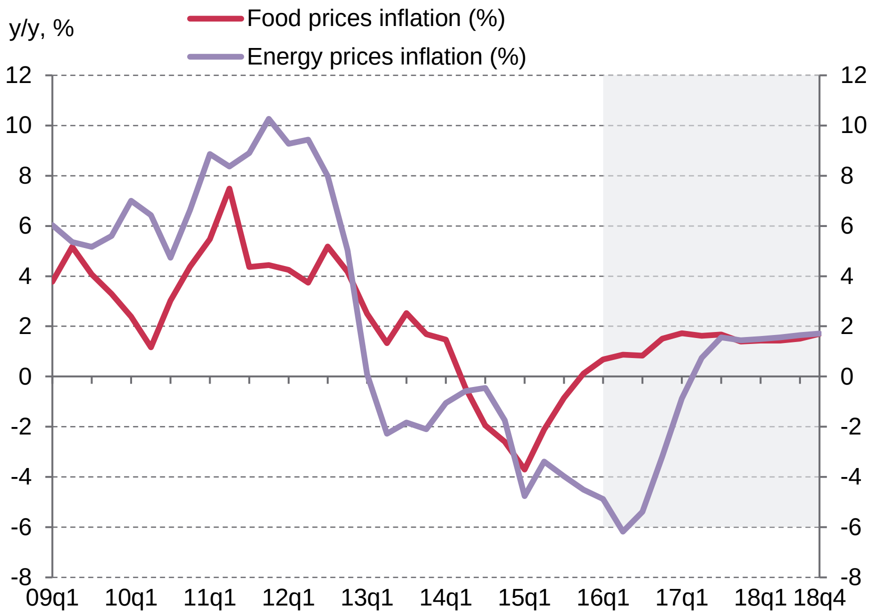


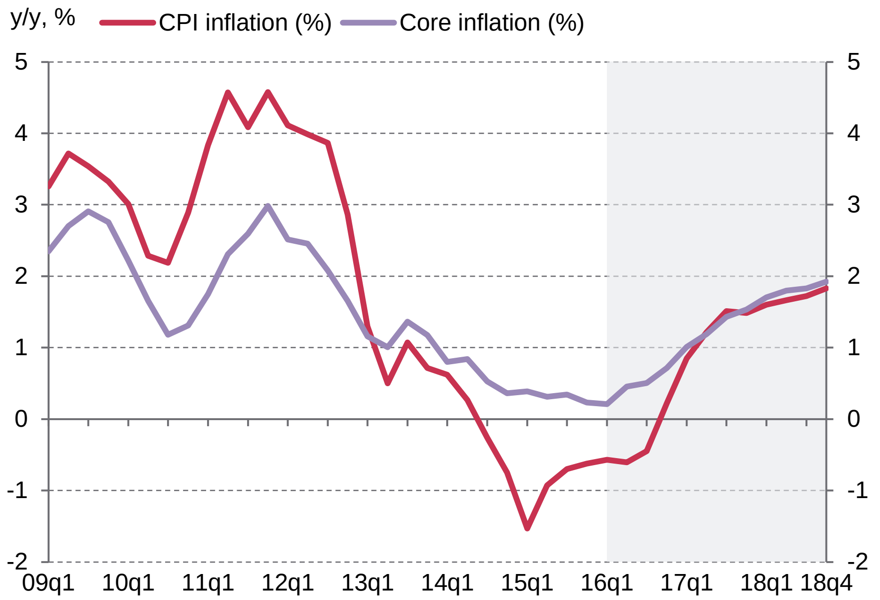
- The increasingly faster rise in the value-added deflator is the effect of rising unit profits on the back of the oil price slump.
- In the longer term, the rise in the deflator will be dragged by weak demand and weak wage pressure.



Source: Eurostat, NBP calculations

Domestic inflation

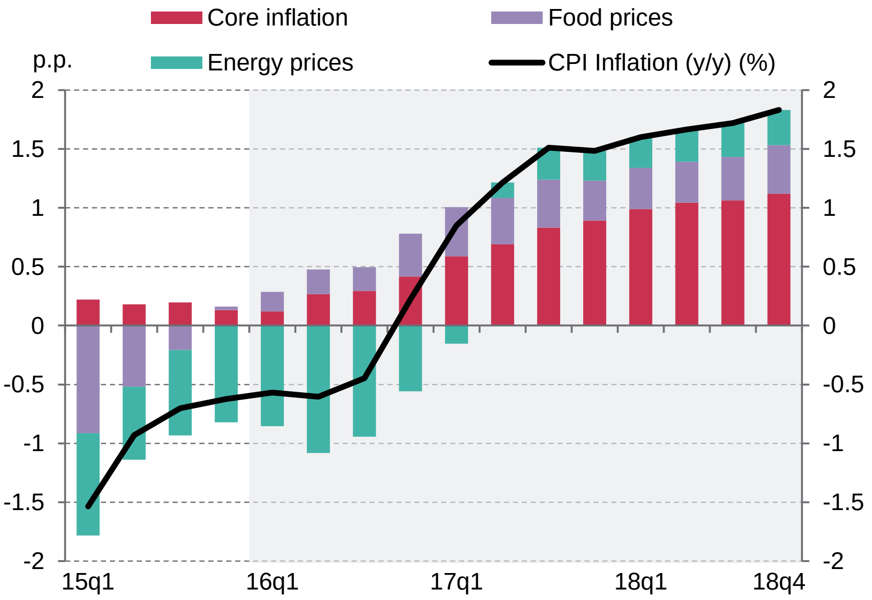


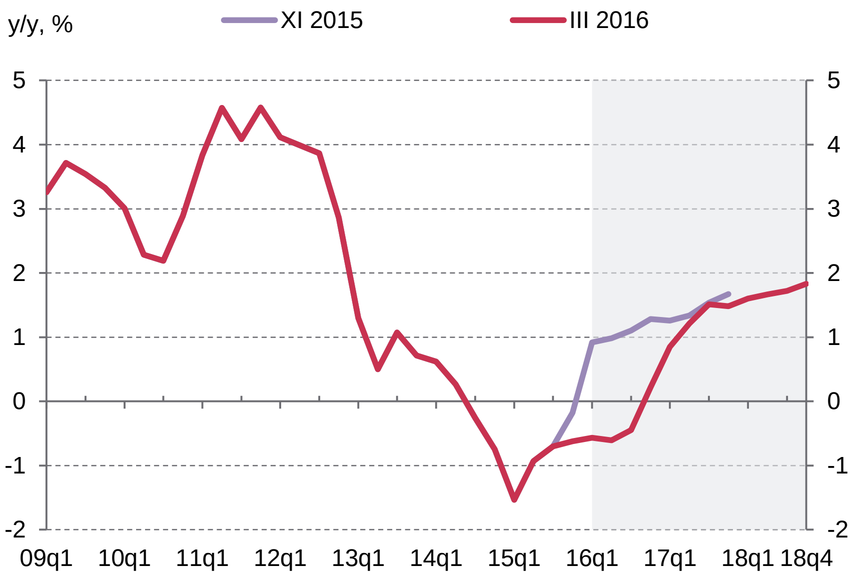


Source: CSO data, NBP calculations

CPI inflation (y/y, %)

(lower)





Source: CSO data, NBP calculations

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

Uncertainty

- Risk factors
- Fan charts

Outline:

Changes between rounds

Projection 2016 - 2018

Uncertainty

Risk factors

<table>
<tr><th>Risk area</th><th>Description</th><th>Impact</th><th>Scale of impact</th></tr>
<tr><td>External environment of the Polish economy</td><td>• Strong deterioration in business conditions in the Chinese economy mainly due to stability of its financial system:
° possible problems with debt servicing for enterprises from the housing and manufacturing sectors due to excessive investment,
° the considerable debt of local government units due to heavy spending on infrastructural projects.
• Turmoil in the financial markets worldwide and a slowdown in the global economy (as a result of deteriorated economic situation in China and advanced economies):
° the trade channel,
° a slump in consumers' and corporate sentiment,
° impact of the United Kingdom’s withdrawal from the European Union (the so-called Brexit).</td><td>Inflation ↓
GDP ↓</td><td>**</td></tr>
</table>

Risk area	Description	Impact	Scale of impact
External environment of the Polish economy	• Faster economic growth in the euro area and Central European economies: ° diminished uncertainty about the global growth (particularly in in the United States and emerging markets), ° early in the projection horizon, stronger impact of the ECB's government bond purchasing programme than currently expected and its possible expansion. • Later in the projection horizon, economic growth could benefit from the effect of the implementation of the European Commission's Investment Plan for the years 2015-2017.	Inflation ↑ GDP ↑	**

Risk area	Description	Impact	Scale of impact
Crude oil prices in the global markets	• Supply disruptions in the global markets: ° supply of Iranian oil as a result of the lifting of sanctions in January 2016 by the European Union and the United States , ° the reaction of American oil producers to the deepening decline in prices of this commodity, ° the restoration of supply from Libya. • Growth prospects in the global economy (especially in emerging countries).	Inflation ↔ GDP ↔	*

<table>
<tr><th>Risk area</th><th>Description</th><th>Impact</th><th>Scale of impact</th></tr>
<tr><td>Fiscal policy</td><td>• Possibility of the government’s measures aimed at limiting the deficit in the years 2017-2018:
° the withdrawal of the planned reduction of the basic VAT rate since 2017 or even its increase,
° boosting the budget revenue:
  • increase in the excise duty on fuel since 2017,
  • the introduction of the planned tax on retail sales,
• slowdown in wage growth in the public sector.</td><td>Inflation↑
GDP↓</td><td>?</td></tr>
<tr><td colspan="2">Conclusions</td><td>Inflation ↔
GDP ↓</td><td></td></tr>
</table>

Outline:

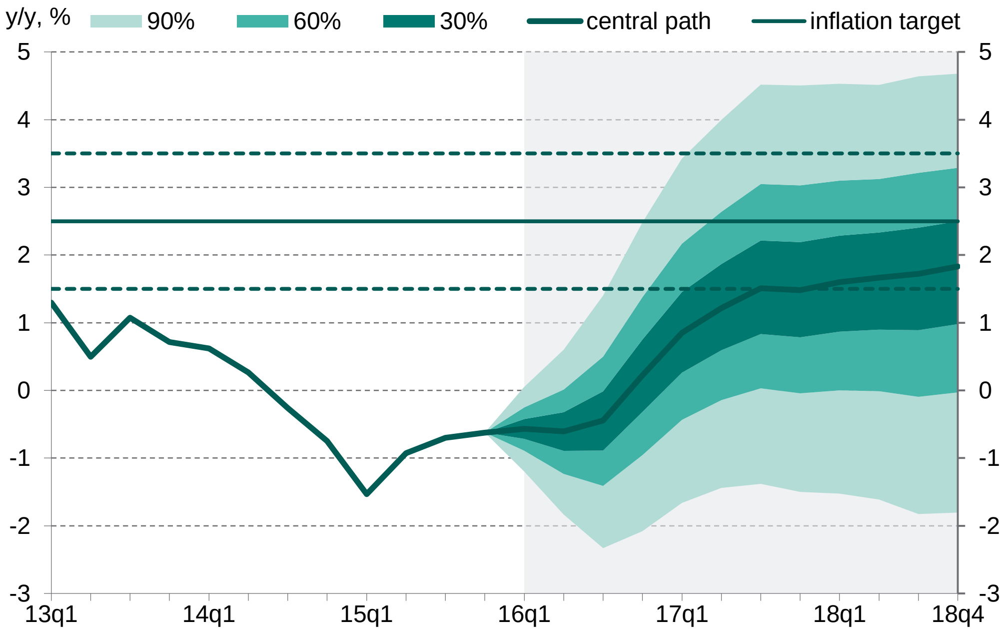
Changes between rounds

Projection 2016 - 2018

Uncertainty

Fan charts

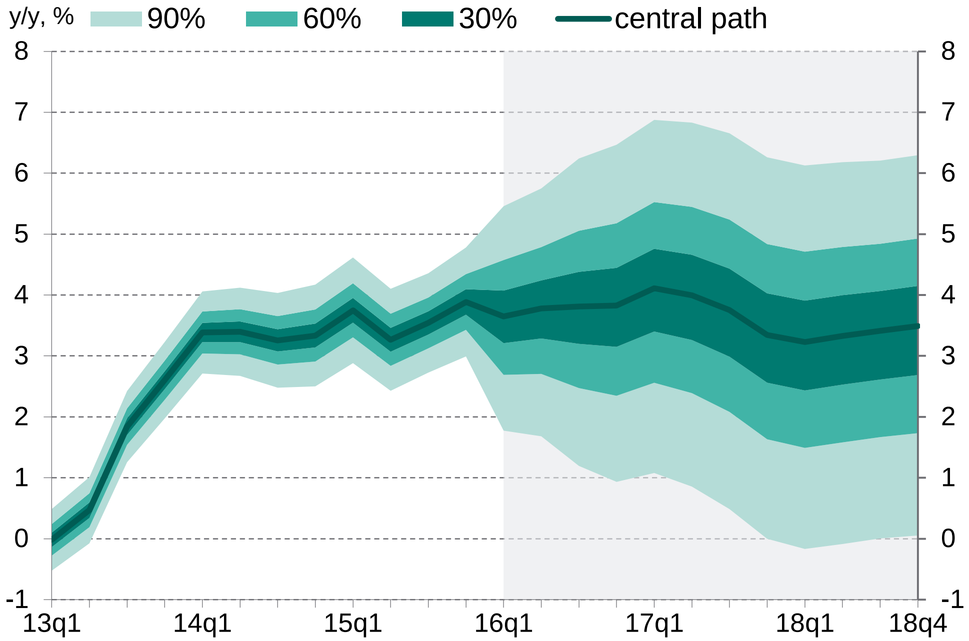
CPI inflation projection – March 2016



	below 1.5%	below 2.5%	below 3.5%	below central path	in the range (1.5-3.5%)
16q1	1.00	1.00	1.00	0.50	0.00
16q2	1.00	1.00	1.00	0.50	0.00
16q3	0.96	1.00	1.00	0.50	0.04
16q4	0.83	0.95	0.99	0.50	0.17
17q1	0.66	0.85	0.95	0.49	0.30
17q2	0.56	0.77	0.91	0.49	0.35
17q3	0.49	0.70	0.86	0.49	0.37
17q4	0.50	0.71	0.86	0.50	0.36
18q1	0.49	0.70	0.86	0.52	0.37
18q2	0.50	0.71	0.87	0.54	0.37
18q3	0.50	0.70	0.86	0.55	0.35
18q4	0.49	0.69	0.85	0.56	0.36

Source: CSO data, NBP calculations

GDP projection — March 2016



Source: CSO data, NBP calculations

We protect the value of money