



NÁRODNÁ BANKA SLOVENSKA
EUROSYSTEM



MEDIUM-TERM FORECAST

Q2
2017

Published by:
© Národná banka Slovenska

Address:
Národná banka Slovenska
Imricha Karvaša 1
813 25 Bratislava
Slovakia

Contact:
+421 2 5787 2146

<http://www.nbs.sk>

Discussed by the NBS Bank Board on
20 June 2017.

All rights reserved.
Reproduction for education and non-commercial purposes is permitted provided that the source is acknowledged.

ISSN 1338-1474 (online)



CONTENTS

1	OVERVIEW	4	Chart 5 Annual HICP inflation and its components	10
2	CURRENT DEVELOPMENTS IN THE EXTERNAL ENVIRONMENT AND IN SLOVAKIA	5	Chart 6 Demand-pull inflation and the output gap	10
3	TECHNICAL ASSUMPTIONS	6	Chart 7 Breakdown of the general government balance	11
3.1	Commodities and the exchange rate	6	Chart 8 Fiscal stance	11
3.2	Foreign demand	6	Chart 9 HICP inflation forecast	13
4	MACROECONOMIC FORECAST FOR SLOVAKIA	7	Chart 10 GDP and its components	14
4.1	Economic growth	7	Chart 11 Average wage broken down by public sector and private sector contributions to its rate of change	14
4.2	The labour market	8	Chart 12 Employment broken down by public sector and private sector contributions to its rate of change	14
4.3	Price developments	9	Chart 13 HICP inflation and its components	15
5	FISCAL OUTLOOK	11		
6	RISKS TO THE FORECAST	13	CHARTS IN BOX	
7	COMPARISON WITH THE PREVIOUS FORECAST	14	Box 1	
			Chart A Investment-to-GDP ratio	15
			Chart B Investment-to-GDP ratio	16
			Chart C Accelerator model for private non-residential investment	16
			Chart D SVAR model; contributions to the year-on-year rate of change in private non-residential investment; deviations from long-term average	17
	LIST OF BOXES			
Box 1	Is current investment activity sufficient for sustainable economic growth?	15		
	LIST OF CHARTS		LIST OF TABLES	
Chart 1	Slovakia's foreign demand and exports of goods and services – trend and forecast	7	Table 1 GDP and inflation projections	4
Chart 2	Household income, household consumption and the household saving ratio – trend and forecast	8	Table 2 Investment	7
Chart 3	GDP and the output gap – trend and forecast	8	Table 3 Wages	9
Chart 4	Employment, hours worked per employee, and the unemployment rate – trend and forecast	9	Table 4 Inflation components	9
			Table 5 Fiscal developments	12
			Table 6 Risks to the forecast	13
			Table 7 Medium-Term Forecast for key macroeconomic indicators	18

1 OVERVIEW

The Slovak economy maintained its solid pace of growth in the first months of 2017, driven mainly by domestic demand. Favourable labour market trends supported private consumption, while investment demand picked up. Foreign demand spurred exports, but a temporary dip in car production was a drag on their growth.

Recent developments and new assumptions for foreign demand have not warranted any revisions to the outlook for the real economy. Decreases in oil and food prices have resulted in a downward revision of the headline inflation forecast. Employers' upbeat employment expectations are expected to be reflected in the labour market in the short term, while an increasing inflow of foreign workers in the period ahead should be conducive to further job growth.

The positive trends are expected to continue in the medium term. GDP is projected to grow by 3.2% in 2017, by 4.2% in 2018 and by 4.6% in 2019. This upward path largely assumes that exports will have an increasing impact after new car production comes on stream. Domestic demand is also expected to increase its contribution, with private consumption buoyed by an

improving labour market situation and rising wage growth, and with investment gradually recovering from its recent slump.

As the economy gathers momentum, so it will support job creation. New vacancies will prove difficult to fill, however, and therefore job growth is envisaged to fall and wage growth to accelerate. The mismatch between labour supply and demand is likely to be addressed by recruiting foreign workers and increasing the number of hours worked per employee. The unemployment rate is projected to fall, down to a historical low of 7% at the forecast horizon.

Headline inflation is expected to accelerate over the projection period, owing mainly to rising prices of food and services. Firming domestic demand is expected to put upward pressure not only on services inflation, but also non-energy industrial goods inflation. Moderate overheating of both the economy and labour market is expected to have an upward impact on inflation over the medium term, with the headline rate projected to oscillate around 2%.

Both the real GDP and inflation outlooks are subject to balanced risks.

Table 1 GDP and inflation projections (annual percentage changes)

	MTF-2017Q2			Difference vis-à-vis MTF-2017Q1		
	2017	2018	2019	2017	2018	2019
GDP	3.2	4.2	4.6	0.0	0.0	0.0
HICP	1.2	1.9	2.0	-0.2	-0.1	-0.1
Demand-pull inflation ¹⁾	1.6	2.4	2.8	0.0	0.1	0.0

Sources: SO SR and NBS.

1) The HICP inflation rate excluding food, energy and administered prices. It better reflects domestic price pressures than does the overall HICP and, when external shocks fade, it is a more accurate indicator of the future inflation path.



2 CURRENT DEVELOPMENTS IN THE EXTERNAL ENVIRONMENT AND IN SLOVAKIA

EURO AREA GDP GROWTH UNCHANGED IN THE FIRST QUARTER OF 2017 FROM THE PREVIOUS QUARTER¹

According to Eurostat's flash estimate, the euro area economy grew at the same pace in the first quarter of 2017 as it did in the previous period, 0.5% quarter on quarter. Increasing construction output points to an upward trend in investment demand. According to incoming data from national statistical authorities, developments in exports and imports are heterogeneous across euro area countries. Leading indicators are at present sending very favourable signals, suggesting that economic growth accelerated in the second quarter. Annual HICP inflation fell to 1.4% in May according to the flash estimate. After increasing in the first months of the year (up to 2%), its subsequent slowdown has stemmed mainly from a softening of energy inflation and, to a lesser extent, food inflation.

SLOVAK ECONOMIC GROWTH DRIVEN MAINLY BY PRIVATE CONSUMPTION²

The Slovak economy maintained its solid pace of growth in early 2017, with its expansion of

0.8% fulfilling the projection of the previous forecast. The growth was driven mainly by domestic demand, according to monthly data. Private consumption continued to be supported by the labour market situation. Investment demand picked up somewhat from depressed levels, boosted by an upturn in lending to non-financial corporations (NFCs).

As for labour market developments, employment growth slowed in the first quarter. The unemployment rate fell to historical lows, resulting in a drop in the number of unemployed who are available for work and able to fill job vacancies. Wage growth remained at elevated levels.

Annual headline inflation broke through 1% in the first months of the year, before falling back to 0.8% in April. The apparent causes of the slowdown were the calendar effects of the Easter period³ and a decline in commodity prices.

¹ For further details, see the „Report on the International Economy – June 2017“.

² For further details, see the „Report on the Slovak Economy – June 2017“.

³ Easter fell in March this year and in April last year. Given the seasonal drop in certain prices (especially food prices) in the pre-Easter period, the annual inflation rate in March and April was more volatile owing to the base effect.



3 TECHNICAL ASSUMPTIONS⁴

3.1 COMMODITIES AND THE EXCHANGE RATE

The **exchange rate**⁵ of the euro against the US dollar appreciated in the period from the cut-off date for the previous forecast. In this June 2017 Medium-Term Forecast (MTF-2017Q2), the assumption for the average exchange rate over the projection period is USD 1.09, which is 3.4% stronger than rate assumed in the March forecast. The nominal effective exchange rate (NEER), calculated with respect to Slovakia's 15 most significant trading partners, is 0.1% stronger in this forecast than in the previous one.

The assumptions for the average **oil price** in this projection exercise are lower than those applied in the March forecast. Based on the recent decline in the oil price and on the price implied by futures markets, this forecast assumes the average price of a barrel of Brent crude oil to be USD 51.6 in 2017, USD 51.4 in 2018 and USD 51.5 in 2019. The assumptions for the oil price in euro have also been revised down, by 5.9% in 2017, 6.2% in 2018 and 5.3% in 2019.

3.2 FOREIGN DEMAND

According to the latest Eurosystem staff projections⁶, the euro area economic recovery is ex-

pected to continue. GDP is projected to grow by 1.9% in 2017, 1.8% in 2018 and 1.7% in 2019. A number of favourable factors are expected to support growth over the forecast period. The ECB's very accommodative monetary policy stance continues to be transmitted to the economy as well as to market expectations of future interest rates. Bank lending to NFCs continues to recover, spurred by low interest rates, rising credit demand and favourable credit supply conditions. A further improvement in labour market conditions and lower deleveraging conditions are also supporting domestic demand. The global economic recovery is projected to strengthen over the forecast period, supporting euro area exports.

Based on favourable developments in Slovakia's foreign demand at the start of the year, as well as on the continuing positive trend in short-term leading indicators, the projections for Slovakia's foreign demand growth in 2017 and 2018 have been revised up from the March forecast – by 0.3 percentage point in 2017, to 4.2%, and by 0.1 percentage point in 2018, to 4.3% – while the projection for 2019 remains unchanged, at 4.1%.

⁴ The technical assumptions of this Medium-Term Forecast are based on the „June 2017 Eurosystem staff macroeconomic projections for the euro area“, with a cut-off date of 16 May 2017.

⁵ The bilateral EUR/USD exchange rate is assumed to remain unchanged over the forecast period at the average level prevailing in the ten-working day period ending on the cut-off date.

⁶ According to the „June 2017 Eurosystem staff macroeconomic projections for the euro area“.

4 MACROECONOMIC FORECAST FOR SLOVAKIA

4.1 ECONOMIC GROWTH

EXPORTS TO ACCELERATE WITH SUPPORT FROM CAR INDUSTRY

Slovakia's foreign demand is expected to continue growing at around 4% per year over the forecast period. Slovak export growth, however, is expected to accelerate strongly once new car production comes on stream. Even

excluding export earnings from that new production, Slovakia is expected to see market share gains.

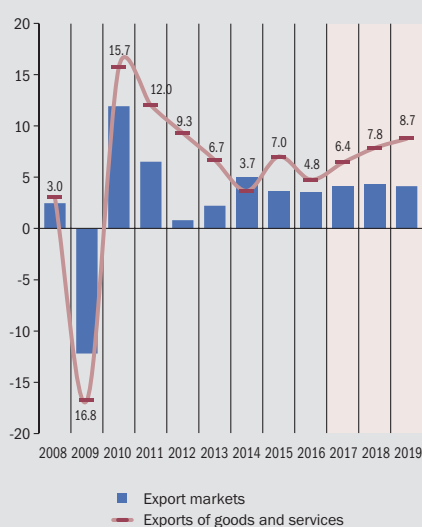
PICK-UP IN INVESTMENT DEMAND

After falling sharply in 2016, overall investment is expected gradually to recover. Private investment demand should continue to be supported by low nominal interest rates and favourable property market trends. The increasing momentum of economic growth is expected to support investment growth over the forecast period, as is the gradual increase in the absorption of EU funds.

STRONG PRIVATE CONSUMPTION GROWTH

The improving labour market situation is expected to boost incomes and consequently private consumption growth. Nominal wage growth in the private sector is projected to accelerate, owing mainly to shortages of skilled labour. These shortages are already evident from sizeable negotiated wage increases at large firms. Public sector wage growth is projected to outpace private sector wage growth, owing mainly to negotiated wage increases in the education and administration sectors. Disposable income growth is envisaged to be strong enough to ensure that the saving ratio remains relatively high even amid the projected increase in private consumption growth.

Chart 1 Slovakia's foreign demand and exports of goods and services – trend and forecast (annual percentage changes; constant prices)



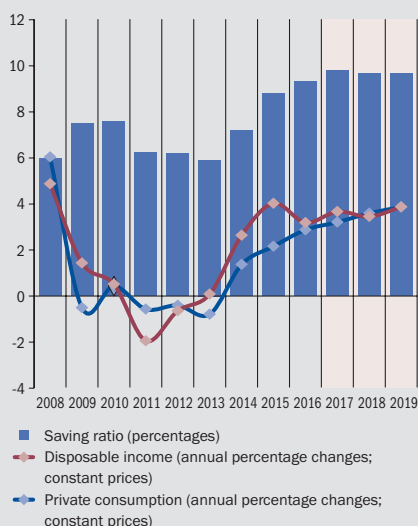
Sources: SO SR, ECB and NBS calculations.

Table 2 Investment (annual percentage changes; constant prices)

	2016	2017	2018	2019
Gross fixed capital formation in total	-9.3	3.1	8.0	4.4
– private sector	4.0	2.8	5.2	4.2
– public sector	-44.4	4.7	21.7	5.3
– public sector including PPP projects	-44.4	6.7	24.7	5.0

Sources: SO SR and NBS calculations.

Chart 2 Household income, household consumption and the household saving ratio – trend and forecast

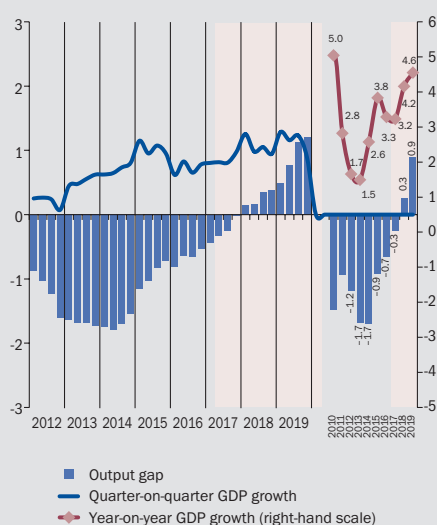


Sources: SO SR and NBS.

ECONOMIC GROWTH TO ACCELERATE OVER THE FORECAST PERIOD

During the forecast period exports are projected to return as the engine of Slovak economic growth. In the context of rising foreign demand for Slovak goods and services, exports will be

Chart 3 GDP and the output gap – trend and forecast (percentages)



Sources: SO SR and NBS.

buoyed by the expansion of car production capacity and their growth is projected to increase to almost 9% by the end of the forecast period. Domestic demand growth is expected to accelerate, supported partly by recovering investment. In the last year of the forecast period domestic demand growth is expected to reach 3.5%. **GDP is projected to grow by 3.2% in 2017, by 4.2% in 2018 and by 4.6% in 2019.** By the end of this year the economy should be operating at equilibrium, while its strong growth thereafter is expected to give rise to increasing overheating that could have an inflationary effect on nominal variables in the economy.

4.2 THE LABOUR MARKET

THE LABOUR MARKET SITUATION SHOULD CONTINUE IMPROVING

Although weaker than expected in the first quarter, employment growth is expected to maintain its brisk pace in 2017. Employers' expectations remain favourable and the number of job vacancies is elevated. The economy is expected to support net job creation over the forecast period, but, with the job-filling rate falling, employment growth is envisaged to slow somewhat. In the context of a low unemployment rate, the inflow of workers from abroad is expected to be stronger than in previous years. Labour force participation is also expected to rise, with increasing recruitment from among women on maternity leave and pensioners. At the same time, amid a widening mismatch between labour supply and demand, the number of hours worked per employee is expected to increase as firms address labour shortages by increasing overtime. The continuing strength of labour demand should maintain upward pressure on wage growth and therefore increase demand-pull inflationary pressures.

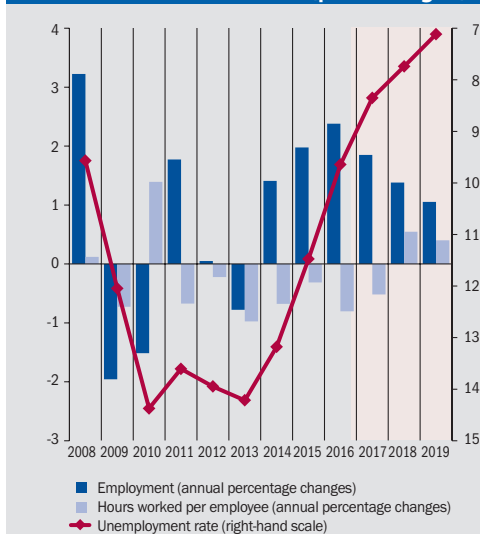
The unemployment rate is expected to maintain its downward path in line with employment growth. The rate is projected to fall to almost 7% in 2019, despite a slight fading of the impact of labour force participation growth and an expected inflow of Slovaks who have been working abroad.

Table 3 Wages (annual percentage changes)

	2016	2017	2018	2019
Nominal labour productivity	0.4	2.2	4.7	5.9
Whole economy – nominal	3.3	4.4	4.8	4.9
Whole economy – real	3.8	3.2	2.8	2.7
Private sector – nominal	2.6	4.3	4.6	4.9
Private sector – real	3.1	3.1	2.6	2.7
Public administration, education and health care – nominal	5.6	4.9	5.6	5.1
Public administration, education and health care – real	6.2	3.7	3.6	2.9

Sources: SO SR and NBS calculations.

Note: Deflated by the CPI. The sector 'Public administration, education and health care' corresponds to sections O, P and Q of the SK NACE Rev. 2 statistical classification of economic activities. Nominal average wage growth in the general government sector (ESA S.13) is projected to be 5.3% in 2017, 5.6% in 2018 and 5.1% in 2019.

Chart 4 Employment, hours worked per employee, and the unemployment rate – trend and forecast (percentages)


Sources: SO SR and NBS.

4.3 PRICE DEVELOPMENTS

INFLATION TO RISE MODERATELY OVER THE FORECAST PERIOD

The average annual inflation rate for 2017 is projected to be higher than the (negative) rate for 2016, owing mainly to increases in food prices, services prices and, to a lesser extent, non-energy industrial goods prices. Over the remainder of the forecast period, headline inflation is projected to accelerate moderately further, as the impact of low energy prices fades, as food prices continue to climb, as services inflation is boosted by domestic demand, and as non-energy industrial goods inflation rises on the back of increases in import prices and in domestic demand. By the end of the forecast period, headline inflation should be oscillating around 2%.

Table 4 Inflation components (annual percentage changes)

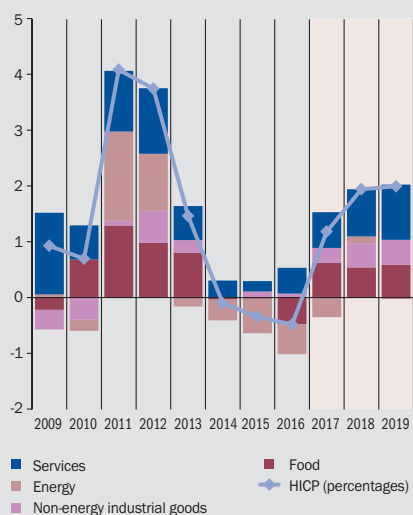
	Average 2004-2008 (pre-crisis period)	Average 2010-2014 (post-crisis period)	2015	2016	2017	2018	2019
HICP	4.1	2.0	-0.3	-0.5	1.2	1.9	2.0
Food	3.6	3.1	-0.1	-2.0	2.4	2.1	2.3
Non-energy industrial goods	0.2	0.3	0.4	0.2	1.0	1.5	1.6
Energy	8.3	2.3	-3.9	-3.5	-2.5	0.8	-0.2
Services	5.3	2.5	0.6	1.5	2.0	2.7	3.1
Demand-pull inflation	1.8	1.0	0.9	0.9	1.6	2.4	2.8

Sources: SO SR and NBS calculations.

Note: The 'neutral level' of price growth (i.e. beta-convergence) for Slovakia is estimated to be around 2.6%.

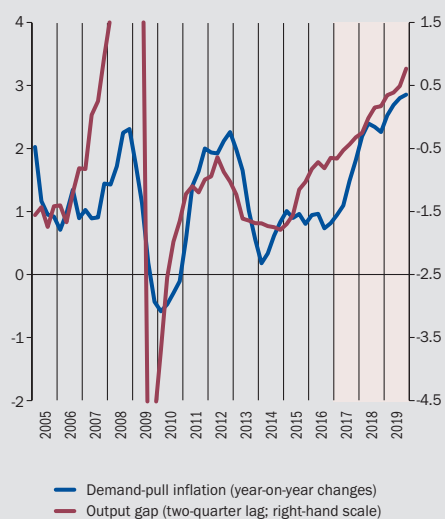


Chart 5 Annual HICP inflation and its components (percentage point contributions)



Sources: SO SR and NBS.

Chart 6 Demand-pull inflation and the output gap (percentages)



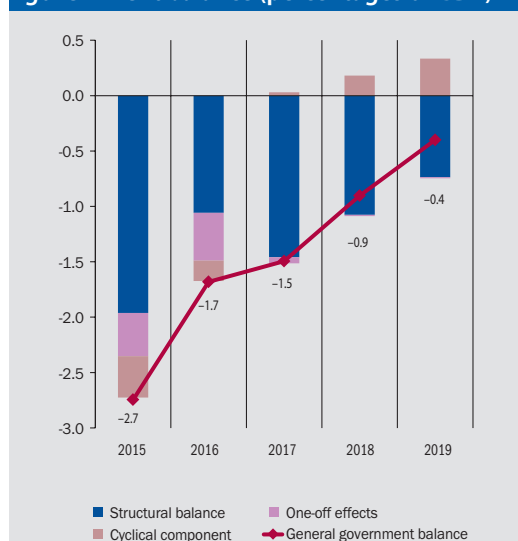
Sources: SO SR and NBS calculations.

5 FISCAL OUTLOOK

FAVOURABLE ECONOMIC TRENDS AND FALLING INTEREST EXPENSES ARE EXPECTED TO SUPPORT A GRADUAL TRIMMING OF THE GENERAL GOVERNMENT BUDGET DEFICIT

The general government budget deficit in 2017 is projected to be 1.5% of GDP, 0.2 percentage point smaller compared with 2016. This moderation is expected to stem from tax revenue growth amid improving macroeconomic conditions and from a fall in interest expenses due to low interest rates, as well as from restrained growth in social spending and intermediate consumption. The impact of these factors should be partially offset by a pick-up in investment activity following its slump in the previous year. Reflecting the effect of these factors, the deficit is projected to moderate further over the forecast period, to 0.9% of GDP in 2018 and 0.4% of GDP in 2019. The budget's improvement is also being supported by certain measures on the revenue side (the prolongation of the special levy in regulated industries, the increase in the special levy on financial institutions, the cancellation of health insurance contribution ceilings, the raising of certain social contribution ceilings, and the taxation of dividends). On the other hand, the reduction in the corporate income tax rate, as well as the scrapping of tax licences, is expected to dent revenues. On the expenditure side of the budget, in addition to strong investment growth, public sector salary increases are projected to have a negative impact on the deficit.

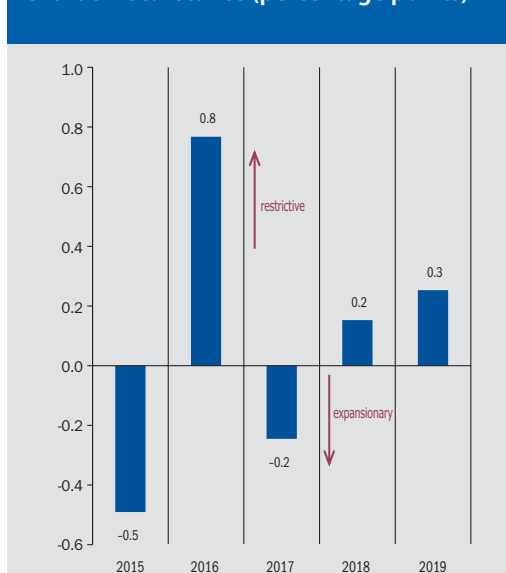
Chart 7 Breakdown of the general government balance (percentages of GDP)



Sources: SO SR and NBS.

Note: One-off factors include non-cyclical effects that have a temporary impact on the general government balance and should be eliminated in the future.

Chart 8 Fiscal stance (percentage points)



Sources: SO SR and NBS.

Note: Annual rate of change in the cyclically adjusted primary balance, adjusted for the impact of extra-budgetary PPP projects and excluding the impact of EU funds.

After being markedly restrictive last year, the fiscal stance is expected to be moderately expansionary in 2017. Owing to revenue measures, as well as to restrained trends in certain areas of expenditure, the domestic fiscal stance is expected to be moderately procyclical over the forecast period.

Final consumption growth is expected to fall in 2017, owing mainly to the current lower expenditure on healthcare and to stronger inflation that reduces expenditure growth in

GOVERNMENT FINAL CONSUMPTION EXPENDITURE TO SLOW TEMPORARILY IN 2017

Final consumption growth is expected to fall in 2017, owing mainly to the current lower expenditure on healthcare and to stronger inflation that reduces expenditure growth in



Table 5 Fiscal developments (annual percentage changes at constant prices, unless otherwise stated)

	2016	2017	2018	2019
General government final consumption	1.6	1.1	1.4	1.6
Government investment	-44.4	4.7	21.7	5.3
General government balance (percentage of GDP)	-1.7	-1.5	-0.9	-0.4
Fiscal stance (year-on-year change in percentage points) ¹⁾	0.8	-0.2	0.2	0.3
Demand impulse (p.p.) ²⁾	-2.4	0.2	0.2	0.0
Gross debt (percentage of GDP)	51.9	51.9	50.4	48.8

Sources: SO SR and NBS calculations.

1) The annual rate of change in the cyclically adjusted primary balance adjusted for the impact of extra-budgetary PPP projects and excluding the impact of EU funds absorbed outside the public sector.

2) Including the impact of extra-budgetary EU funds and PPP projects. A positive value denotes an expansionary impact.

real terms. Over the rest of the forecast period, however, increases in expenditure on health-care and on goods and services are projected to have a gradual upward impact on final consumption.

After investment activity slumped in 2016 due to the slower absorption of EU funds under the new EU programming period, investment activity is expected to pick-up moderately in 2017. The impact of EU funds' absorption under the 2014-20 programming period and related investment activity, including local authority investment, is expected to be most pronounced in 2018. The

higher investment activity should include an increased contribution from investments financed out of own resources.

PRIMARY SURPLUS AND ECONOMIC GROWTH WILL ACCELERATE PUBLIC DEBT REDUCTION

Government debt is expected to remain unchanged in 2017 at 51.9% of GDP. An improving general government primary balance and falling costs interest expected are expected to result in the government debt falling over the forecast period, to 50.4% of GDP in 2018 and 48.8% of GDP in 2019.

6 RISKS TO THE FORECAST

The risks to real GDP growth outlook are balanced, as are the risks to the inflation outlook. In the near term, particular attention should be paid to certain aspects of the labour market and investment developments, namely wage growth dynamics and the onset of EU funds' absorption under the new programming period.

Chart 9 HICP inflation forecast (percentages)

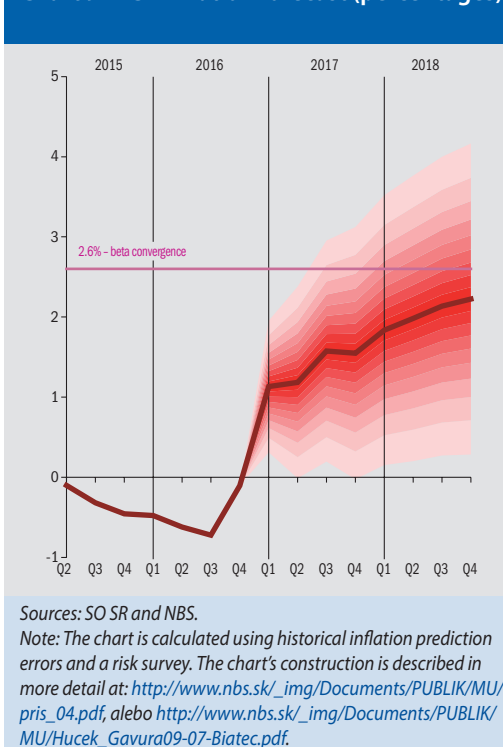


Table 6 Risks to the forecast

	2017	2018	2019
GDP	Balanced	Balanced	Balanced
Inflation	Balanced	Balanced	Balanced

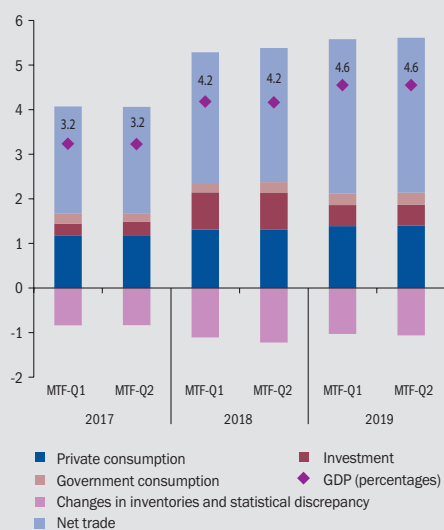
Source: NBS.

7 COMPARISON WITH THE PREVIOUS FORECAST

No significant changes to GDP growth outlook

Economic developments in the first quarter of this year were in line with expectations. Foreign demand was marginally higher than projected in the March 2017 Medium-Term Forecast (MTF-2017Q1), and consequently export growth was higher, too. Current indicators imply higher than projected investment demand this year, but that impact is offset by higher import growth and partly by lower government consumption expenditure. Neither the technical assumptions, nor recent developments have warranted any revisions to the economic growth outlook.

Chart 10 GDP and its components⁷ (annual percentage changes; percentage point contributions)



Sources: SO SR and NBS.

Note: The item 'Changes in inventories and statistical discrepancy' includes uncategorised imports that remained after the calculation of import intensity.

Improved labour market outlook

Employment growth at the start of 2017 was slightly slower than projected in the March forecast, and therefore the employment growth forecast for this year has been revised down slightly. The softening of job growth is expected to have been a blip – a view supported by surveys of em-

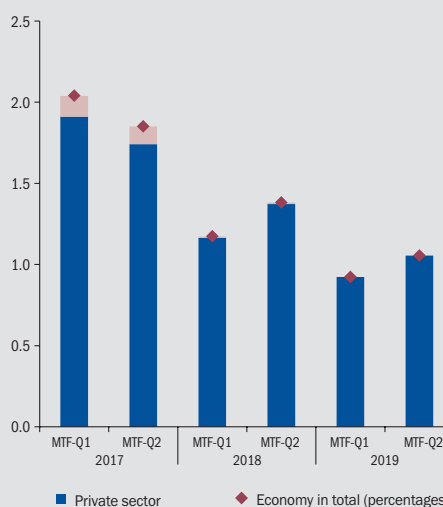
Chart 11 Average wage broken down by public sector and private sector contributions to its rate of change (annual percentage changes; percentage points)



Sources: SO SR and NBS.

Note: The public sector comprises sections O, P and Q of the SK NACE Rev. 2 statistical classification of economic activities.

Chart 12 Employment broken down by public sector and private sector contributions to its rate of change (annual percentage changes; percentage points)



Sources: SO SR and NBS.

Note: The public sector comprises sections O, P and Q of the SK NACE Rev. 2 statistical classification of economic activities

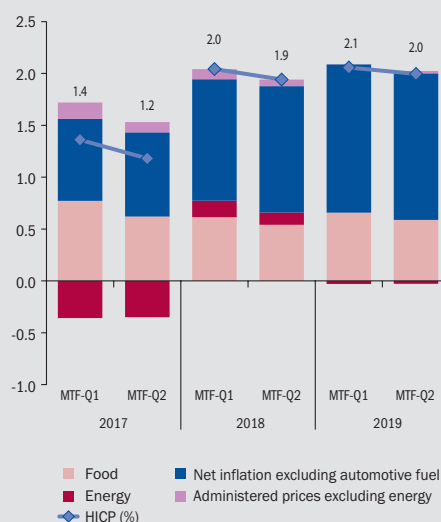
⁷ The composition of GDP growth is calculated as the contributions of components to GDP growth after deducting their import intensity. In this case the calculation uses the constant import intensity of the different GDP components (household final consumption – 30%, government consumption – 7%, investment – 50%, and exports – 62.5%). Remaining imports were included under changes in inventories and the statistical discrepancy.

ployers – and the job-filling rate should pick up in the period ahead thanks in part to an increasing inflow of workers from abroad. As a result, the employment growth outlook for subsequent years has been revised up marginally, while unemployment rate projections remain unchanged. Current wage developments and incoming information on wage bargaining have not as yet necessitated any revisions to the wage growth outlook.

INFLATION OUTLOOK REVISED DOWN SLIGHTLY DUE TO TECHNICAL ASSUMPTIONS

Recent developments imply that the average headline inflation rate for 2017 will be marginally lower than projected in the March forecast. The main causes of the slowdown are expected to be lower food inflation and falling prices of pharmaceutical goods. The inflation outlook for subsequent years has been revised up slightly, although food inflation is still envisaged to weigh on the headline rate.

Chart 13 HICP inflation and its components (annual percentage changes; percentage point contributions)



Sources: SO SR and NBS.

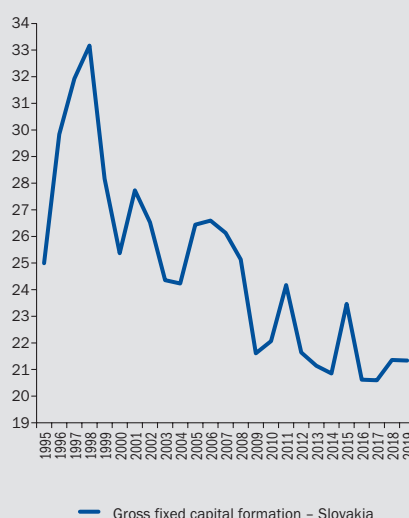
Box 1

IS CURRENT INVESTMENT ACTIVITY SUFFICIENT FOR SUSTAINABLE ECONOMIC GROWTH?

Although it has been gradually picking up since last year – when investment slumped amid a sharp drop in EU funds' absorption – the total investment-to-GDP ratio in Slovakia remains at historically low levels. Its post-crisis peaks have not even reached its pre-crisis lows.⁸ In Chart A, the ratio in the post-crisis period is seen to be fluctuating at levels that are several percentage points lower than the pre-2009 levels.

In international comparison, similar trends may be observed in most central and eastern European countries, but not in the advanced economies of the EU 'core', i.e. France and Germany. Chart B shows that certain aspects of economic developments in Slovakia and similar economies may have resulted in a lower investment ratio (investment-to-GDP ratio), which may be considered to be a new equilibrium.

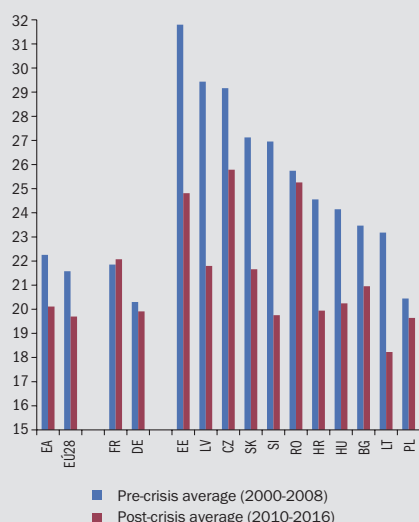
Chart A Investment-to-GDP ratio (percentages)



Sources: SO SR and NBS calculations.

⁸ Notwithstanding that a proportion of private investment has in recent years been co-financed with EU funds.

**Chart B Investment-to-GDP ratio
(percentages)**



Source: Eurostat.

librium. The investment activity necessary to support a given level of economic output may not be as high in the post-crisis period as in the pre-crisis period.⁹ Leaving aside public investment trends, which are subject to many one-off effects, the model-based approaches below suggest that private investment activity in Slovakia is broadly consistent with aggregate economic output.

The so-called *accelerator model* offers a relatively simple approach to evaluating the sufficiency of investment activity. It describes investment as a lag function of changes in the desired capital stock: $I_t = \alpha + \sum_{i=0}^N \omega_i \Delta K_{t-i}^* + \delta K_{t-1}$, where I refers to investment, and K to the capital stock. Assuming that changes in the desired capital stock are proportional to changes in GDP (i.e. $\Delta K_t^* = c \Delta Y_t$), the accelerator model may be formulated and estimated as: $\frac{I_t}{K_{t-1}} = \frac{\alpha}{K_{t-1}} + \sum_{i=1}^N \beta_i \frac{\Delta Y_{t-i}}{K_{t-1}} + \delta + e_t$, where e_t is an error term, δ is an indirect estimate of the depreciation rate and $\beta_i = \omega_i c$. The current value of GDP growth is not included in the estimated equation in order to reduce endogeneity concerns.

Chart C presents accelerator model estimation results for private non-residential investment in Slovakia¹⁰ (and the sectorally corresponding, private non-residential capital stock) for the estimation period 1995Q1–2016Q4.¹¹ The results indicate that the cumulative change in economic output explains quite well the rates of change in investment over the estimation period. Not even at the end of the period is there any significant deviation from the rates indicated by the models (the actual values occur at a 90% confidence level).

The determinants of investment developments may be examined in more detail using a *Structural Vector Autoregression (SVAR) model*. In this case, the model is based on rates of change in the following variables: foreign demand, economic certainty, private consumption, gross operating surplus and mixed income, private non-residential investment, interest rate, and economic sentiment.¹² The SVAR model results, estimated for the period 1997Q1–2016Q4, show that the **main driver of investment in Slovakia is foreign demand**. On the other hand, the factors included in the model fail to explain a large part of the variation in investment. The very **low**

Chart C Accelerator model for private non-residential investment (EUR millions)



Source: NBS calculations.

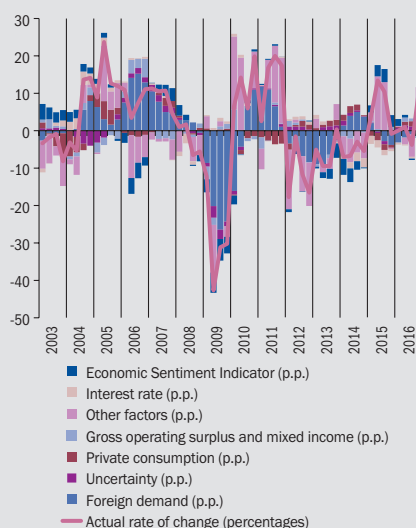
⁹ For further details, see Box 2 Investment developments in the „Report on the Slovak Economy – March 2017“ (http://www.nbs.sk/_img/Documents/_Publikacie/SESR/2017/protected/SESR_0317sk.pdf)

¹⁰ Private investment excluding residential investment.

¹¹ The model was estimated for $N=12$.

¹² The model was estimated for the variables in this order and at lag order 4.

Chart D SVAR model; contributions to the year-on-year rate of change in private non-residential investment; deviations from long-term average (p.p.)



Sources: SO SR and NBS calculations.

explanatory value of the profitability ratio may be related to extensive integration of Slovak industry in global value chains. Chart D shows the contributions of individual structural shocks to the rate of change in investment, and makes clear that the factors which have been weighing on investment in the past two years are slowly disappearing. What stands out at the end of the time series is the fading negative impact of low foreign demand. Investment growth in the past two years has been at, or even above, its long-term average (1.95%).

At first glance, aggregated investment activity in Slovakia in the post-crisis period may appear to be excessively subdued. According to the above model-based approaches, however, investment in Slovakia, at least in its private productive form (private non-residential investment), has been broadly in line with economic output and with the investment activity determinants considered above.



Table 7 Medium-Term Forecast (MTF-2017Q2) for key macroeconomic indicators

Indicator	Unit	Actual data	MTF-2017Q2				Difference vis-à-vis MTF2017Q1		
		2016	2017	2018	2019	2017	2018	2019	
Prices									
HICP inflation	annual percentage change	-0.5	1.2	1.9	2.0	-0.2	-0.1	-0.1	
CPI inflation	annual percentage change	-0.5	1.2	2.0	2.1	-0.2	-0.1	-0.1	
GDP deflator	annual percentage change	-0.4	1.1	1.9	2.3	-0.1	0.0	0.1	
Economic activity									
Gross domestic product	annual percentage change, constant prices	3.3	3.2	4.2	4.6	0.0	0.0	0.0	
Private consumption	annual percentage change, constant prices	2.9	3.2	3.6	3.9	-0.1	0.0	0.1	
Final consumption of general government	annual percentage change, constant prices	1.6	1.1	1.4	1.6	-0.2	0.2	0.0	
Gross fixed capital formation	annual percentage change, constant prices	-9.3	3.1	8.0	4.4	0.6	-0.1	0.0	
Exports of goods and services	annual percentage change, constant prices	4.8	6.4	7.8	8.7	0.0	0.2	0.0	
Imports of goods and services	annual percentage change, constant prices	2.9	6.8	7.7	8.1	0.3	0.1	0.1	
Net exports	EUR millions at constant prices	5,790	5,854	6,397	7,515	-258.5	-207.3	-228.4	
Output gap	percentage of potential output	-0.7	-0.3	0.3	0.9	-0.1	0.0	-0.1	
Gross domestic product	EUR millions at current prices	80,958	84,477	89,693	95,947	-107.1	-130.8	-61.9	
Labour market									
Employment	thousands of persons, ESA 2010	2,321	2,364	2,397	2,422	-4.4	0.6	3.6	
Employment	annual percentage change, ESA 2010	2.4	1.9	1.4	1.1	-0.1	0.2	0.2	
Number of unemployed	thousands of persons ¹⁾	266	231	215	198	-0.7	1.1	0.1	
Unemployment rate	percentage	9.6	8.4	7.7	7.1	0.0	0.0	0.0	
Unemployment gap ²⁾	percentage points	0.4	-0.3	-0.7	-1.1	0.1	0.0	0.0	
Labour productivity ³⁾	annual percentage change	0.9	1.4	2.7	3.5	0.2	-0.3	-0.1	
Nominal productivity ⁴⁾	annual percentage change	0.4	2.2	4.7	5.9	0.0	-0.3	0.0	
Nominal compensation per employee	annual percentage change, ESA 2010	1.8	4.3	4.8	4.9	0.0	0.0	0.0	
Nominal wages ⁵⁾	annual percentage change	3.3	4.4	4.8	4.9	0.0	0.0	0.0	
Real wages ⁶⁾	annual percentage change	3.8	3.2	2.8	2.7	0.2	0.1	0.1	
Households and non-profit institutions serving households									
Disposable income	constant prices	3.2	3.7	3.4	3.9	0.0	-0.1	0.2	
Saving ratio ⁷⁾	percentage of disposable income	9.3	9.8	9.7	9.7	0.0	0.0	0.1	
General government sector ⁸⁾									
Total revenue	percentage of GDP	40.0	39.9	40.0	39.5	-0.2	-0.2	-0.2	
Total expenditure	percentage of GDP	41.6	41.4	40.9	39.9	-0.3	-0.2	-0.2	
General government balance ⁹⁾	percentage of GDP	-1.7	-1.5	-0.9	-0.4	0.1	-0.1	-0.1	
Cyclical component	percentage of trend GDP	-0.2	0.0	0.2	0.3	-0.1	0.0	0.0	
Structural balance	percentage of trend GDP	-1.1	-1.5	-1.1	-0.7	0.1	-0.1	0.0	
Cyclically adjusted primary balance	percentage of trend GDP	0.2	0.0	0.3	0.6	0.1	-0.1	0.0	
Fiscal stance ¹⁰⁾	year-on-year change in p. p.	0.8	-0.1	0.3	0.2	-0.1	-0.2	-0.1	
General government gross debt	percentage of GDP	51.9	51.9	50.4	48.8	0.0	-0.1	-0.4	



Table 7 Medium-Term Forecast (MTF-2017Q1) for key macroeconomic indicators (continuation)

Indicator	Unit	Actual data	MTF-2017Q2				Difference vis-à-vis MTF2017Q1		
		2016	2017	2018	2019	2017	2018	2019	
Balance of Payments									
Trade balance (goods)	percentage of GDP	2.8	2.2	2.2	3.0	-0.6	-0.7	-0.8	
Current account	percentage of GDP	-0.7	-0.3	-0.1	0.9	-0.5	-0.7	-0.8	
External environment and technical assumptions									
Slovakia's foreign demand	annual percentage change	3.6	4.2	4.3	4.1	0.3	0.1	0.0	
Exchange rate (USD/EUR) ¹¹⁾	level	1.11	1.08	1.09	1.09	2.5	3.4	3.4	
Oil price in USD ¹¹⁾	level	44.0	51.6	51.4	51.5	-3.6	-3.0	-2.0	
Oil price in USD	annual percentage change	-15.9	17.1	-0.4	0.3	-4.3	0.6	1.0	
Oil price in EUR	annual percentage change	-15.7	19.5	-1.1	0.3	-7.5	-0.2	1.0	
Non-energy commodity prices in USD	annual percentage change	-3.9	6.4	2.0	4.5	-6.8	-1.5	-0.1	
Three-month EURIBOR	percentage per annum	-0.3	-0.3	-0.2	0.0	0.0	0.0	0.0	
Ten-year Slovak government bond yields	percentage	0.5	1.1	1.3	1.6	0.0	-0.1	0.0	

Sources: NBS, ECB and SO SR.

1) Labour Force Survey.

2) Difference between the unemployment rate and NAIRU (non-accelerating inflation rate of unemployment). A positive value indicates that the unemployment rate is higher than the NAIRU.

3) GDP at constant prices / employment – ESA 2010.

4) Nominal GDP divided by persons in employment (according to SO SR quarterly statistical reporting).

5) Average monthly wages (according to SO SR statistical reporting).

6) Wages according to SO SR statistical reporting, deflated by CPI inflation.

7) Saving ratio = gross savings / (gross disposable income + adjustments for any pension entitlement change) *100; Gross savings = gross disposable income + adjustments for any pension entitlement change - private consumption.

8) S.13; fiscal outlook.

9) B9n – Net lending (+) / borrowing (-)

10) Year-on-year change in cyclically adjusted primary balance; a positive value denotes tightening.

11) Changes vis-à-vis the previous forecast (percentages).

Time series of selected macroeconomic indicators can be found on the NBS website at http://www.nbs.sk/_img/Documents/_Publikacie/PREDIK/2017/protected/P2Q-2017.xls