CENTRAL BANK OF MONTENEGRO

INFLATION REPORT
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1. INFLATION INDICATORS

Consumer price growth trend recorded in the previous year extended over the first three quarters of 2018. In Q3, the consumer price growth stalled, specifically by 0.2% in relation to Q2 (Graph 1), mainly as a result of the price growth seen in the categories housing, water, electricity gas and other fuels and clothing and footwear. Observation of the monthly price trends reveals that consumer price growth was recorded in July (0.2%) and September (0.1%), whereas in August consumer prices declined (-0.1%). Average consumer price rate (the first nine months of 2018 in relation to the same period of 2017) stood at 2.9%, while at the annual level, the prices rose by 1.9%. Annual consumer price growth rates were also recorded in the neighbouring countries, as well as in the majority of the EU countries.

Table 1

Inflation, %

	2017				2018		
	III	VI	IX	XII	III	VI	IX
Change in relation to the previous year-end	0.5	0.5	2.2	1.9	1.5	2.0	2.2
Annual change	2.7	2.1	2.8	1.9	2.9	3.4	1.9

Source: MONSTAT

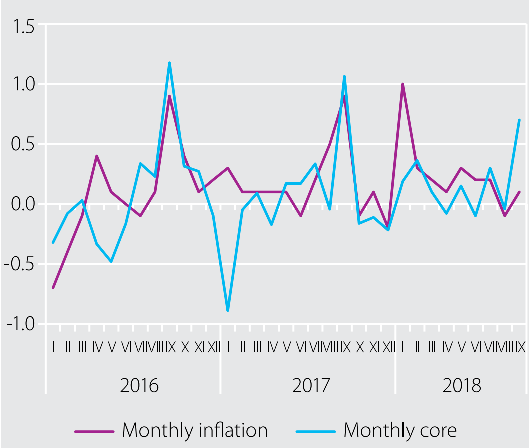
In Q3, price growth in Montenegro was recorded in six out of twelve categories that comprise 47.9% of the consumer basket (Table 2). The most prominent rise in prices was recorded in the categories *clothing and footwear* (3.8%) and *housing, water, electricity gas and other fuels* (3%). These categories provided the most significant contribution to total inflation (of 0.3 and 0.4 percentage points, respectively). The 5.3% increase in the prices of clothing was the main driver behind the price growth in the clothing and footwear category, whereas the growth seen in the category housing, water, electricity gas and other fuels was mainly a result of a 16.1% rise in the prices of solid fuels. At the same time, the prices increased in the following categories: *miscellaneous goods and services* (1.3%), *restaurants and hotels* (1.1%), *furnishings, household equipment and routine household maintenance* (0.8%), and *transport* (0.4%). The most significant price decline was seen in the *alcoholic beverages and tobacco* (-7%), as a result of tobacco price drop (-9.8%) due to the adjustments of excise duties[1]. The price decline in this category, along with the 0.7% decline in the prices of *food and non-alcoholic beverages*, gave the main negative contributions to total inflation (-0.3 percentage points each). Decline was also observed in *health* (-0.8%) and *recreation and culture* (-0.2%). Prices in the categories *communications* and *education* did not change in Q3.

Monthly core inflation was higher than the official monthly inflation during all three months of Q3 2018 (July, August, and September). Core inflation rate was positive in July and September, while in August it was negative (Graph 2).

[1] Pursuant to the Law Amending the Law on Excise Taxes, OGM 055/18, of 1 August 2018

Graph 2

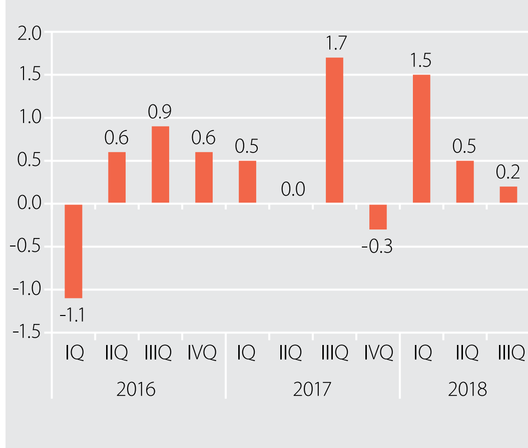
Total and core inflation trends (%)



Source: MONSTAT and CBCG calculations

Graph 1

Quarterly inflation rates (%)



Source: MONSTAT and CBCG calculations

The annual core inflation rate in September 2018 stood at 1.2% or by 0.7 percentage points below the total inflation. The increase in the prices of certain agricultural products, tobacco, electricity and fuels, which are excluded from the calculation of core inflation, made a significant contribution to the growth of total inflation. Annual core inflation was below total inflation in all three months of Q3, maintaining the positive rate throughout that period.

Table 2

Share of selected categories in total inflation[2]

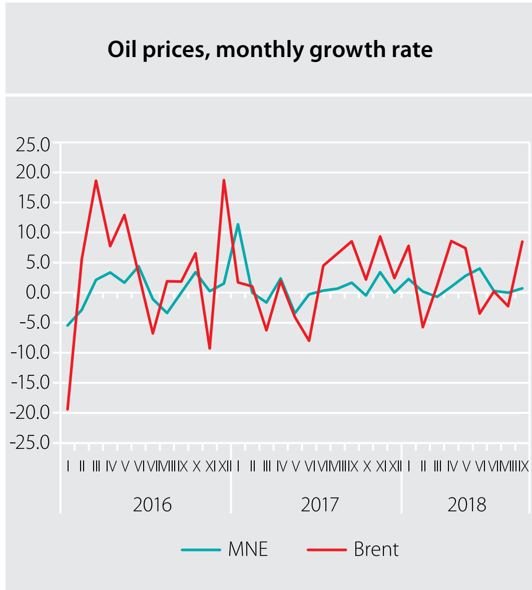
	Weights	IX 18/VI 18	Growth rate	Contribution
TOTAL	**1000**	**100.2**	**0.2**	**0.2**
Food and non-alcoholic beverages	341.1	99.3	-0.7	-0.3
Alcoholic beverages and tobacco	40.4	93.0	-7.0	-0.3
Clothing and footwear	86.1	103.8	3.8	0.3
Housing, water, electricity gas and other fuels	154.0	103.0	3.0	0.4
Furnishing, household equipment and routine household maintenance	39.4	100.8	0.8	0.0
Health	40.8	99.2	-0.8	0.0
Transport	109.4	100.4	0.4	0.0
Communication	48.5	100.0	0.0	0.0
Recreation and culture	32.0	99.8	-0.2	0.0
Education	18.7	100.0	0.0	0.0
Restaurants and hotels	47.6	101.1	1.1	0.0
Miscellaneous goods and services	42.0	101.3	1.3	0.0

Source: MONSTAT and CBCG calculations

[2] It should be noted that, regardless of the index changes, due to the weight structure, the contribution of the share of certain categories is not recorded before the second, i.e. third decimal.

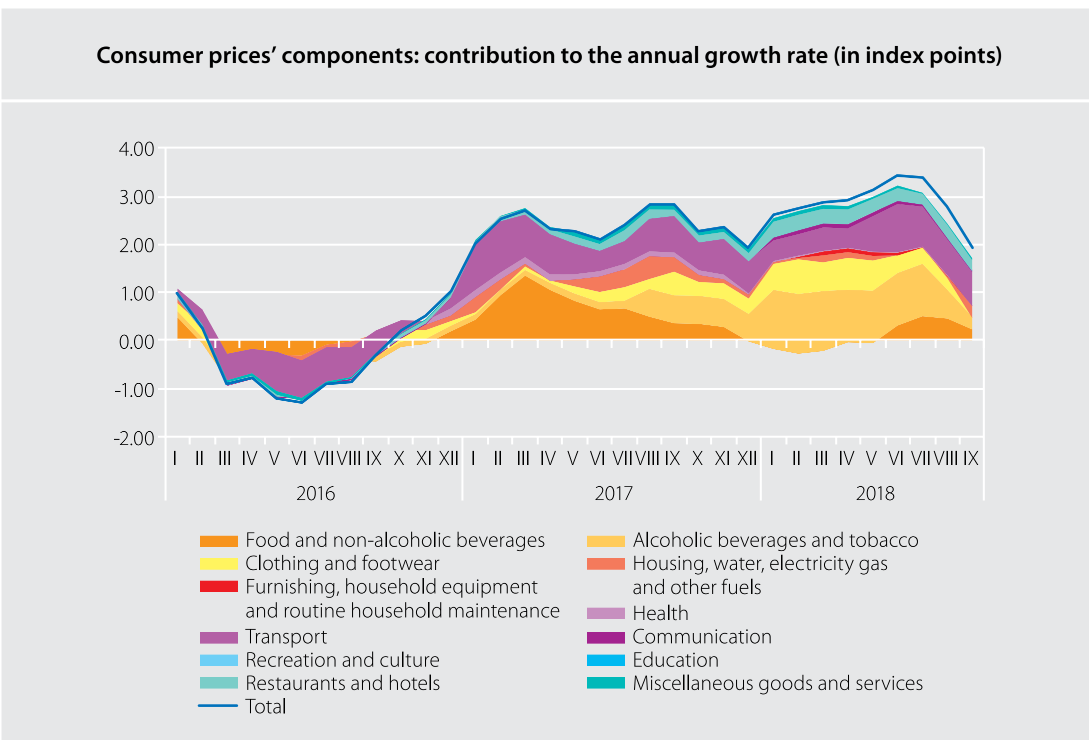
In Q3 2018, oil prices at global markets recorded quarterly increase. In the observed quarter, the OPEC reference basket price averaged 74.2 USD/barrel, being 3.2% higher than the average price seen in the previous quarter. In this period, the average price of Brent stood at 75.3 USD/barrel, or 1.4% more compared to the average price in the Q2. This price peaked in September (at 78.8 USD/per barrel), reaching its highest level since November 2014 (when it stood at 78.9 USD/barrel). In its report for 2019, the World Bank[3] forecasted a mild oil price increase, from the average price of 72 USD/barrel estimated for 2018 to 74 USD/barrel. The Report stated the following downside risks to the price forecast: the USA influencing the export of oil from Iran, continuing declines in production in Venezuela, as well as the inability or reluctance to expand production more significantly.

Graph 3



Source: MONSTAT and "Monthly Oil Market Reports", OPEC

Graph 4



Source: MONSTAT and CBCG calculations

3 "Commodity Markets Outlook" - October 2017

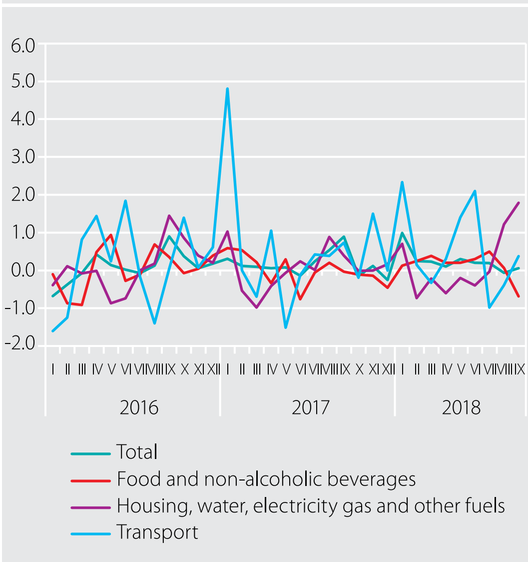
Graph 5

Consumer prices, annual rate

Source: MONSTAT

Graph 6

Selected categories – consumer prices, monthly growth rate



Source: MONSTAT

Annual price growth of 6.4% in the *transport* category gave the largest contribution (0.7 percentage points) to the total annual inflation rate growth of 1.9%. Annual price growth was also seen in the following categories: *alcoholic beverages and tobacco* (6.5%), *restaurants and hotels* (4.8%), *housing, water, electricity gas and other fuels* (1.6%), *communications and miscellaneous goods and services* (1.1% each), *food and non-alcoholic beverages* (0.7%), and *furnishings, household equipment and routine household maintenance* (0.5%). The annual fall in prices was recorded in the categories of *recreation and culture* (-1%) and *health* (-0.5%), while prices in the category of *education* remained unchanged.

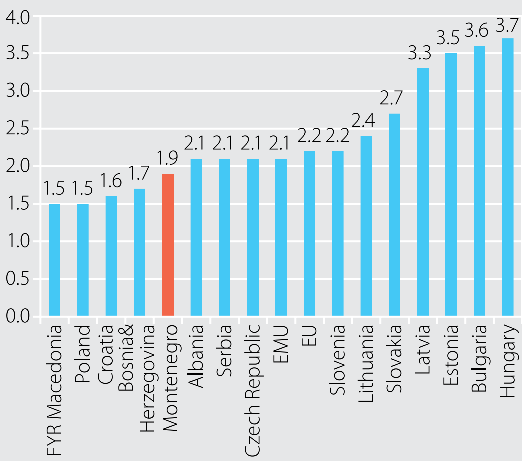
In September, **producers' prices of manufactured products** recorded 2.1% growth in relation to December 2017. This was due to the price growth recorded in the electricity, gas and steam supply sector (4.4%) and mining and quarrying sector (1.8%). Price decline of -1% was seen in the manufacturing industry and mining and quarrying sectors. At the annual level, producers' prices of manufactured products rose by 2.4%.

Comparison of annual inflation in Montenegro with that recorded in selected countries reveals that, beside Montenegro, all the selected countries recorded positive annual inflation rate. The highest annual inflation rate was recorded in Hungary (3.7%) while Macedonia and Poland experienced the lowest annual inflation rate (1.5% each).

The annual HICP inflation rate reported in the euro area amounted to 2.1%, while the CPI inflation in Montenegro amounted to 1.9%, and the annual HICP inflation in Montenegro was 1.7% in September.

Graph 7

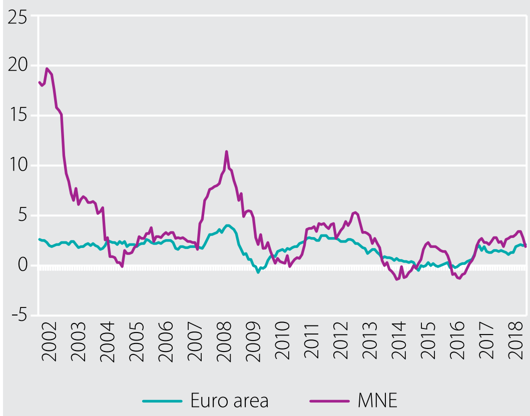
Annual inflation in selected countries, September 2018



Source: national statistical offices and Eurostat

Graph 8

Inflation in the euro area (HICP) and Montenegro (CPI)[4] since the introduction of the euro (annual rates)



Source: MONSTAT and Eurostat

[4] Cost of living were used for measuring inflation in Montenegro until 2009, after which consumer prices were introduced.

2. INFLATION EXPECTATIONS

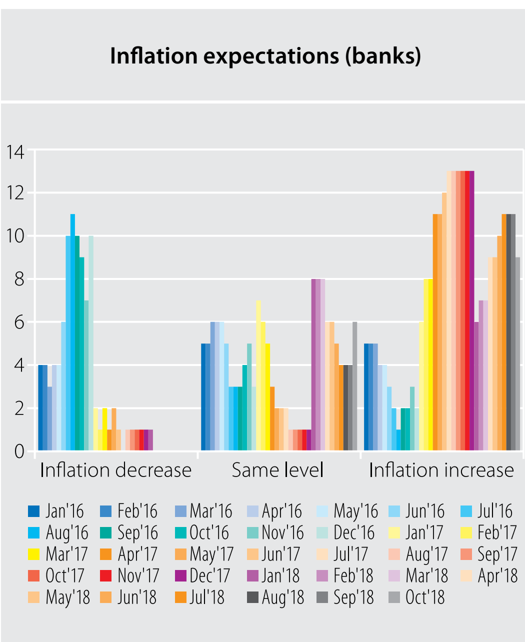
2.1. Banks’ expectations

In reference to inflation expectations of banks, based on the survey conducted in October this year, nine banks expected inflation to grow, six banks banks expected inflation at the same level as in 2017, while none of the banks expected inflation to decline in relation to 2017 (Graph 9).

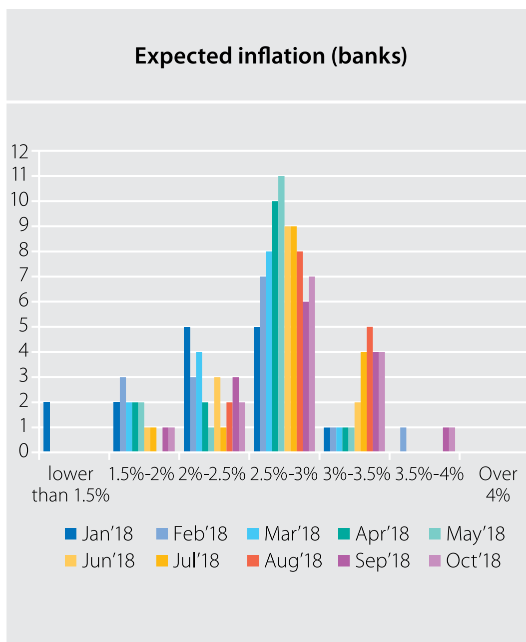
When it comes to inflation levels, expectations varied among banks. Seven banks expect inflation to range between 2.5% and 3%, four banks expect inflation between 3% and 3.5%, inflation expectations in the range of 2% to 2.5% are reported by two banks, one bank expects inflation 1.5% and 2%, one bank between 3.5% and 4%, while none of the banks expects inflation below 1.5% or above 4% (Graph 10).

In reference to expectations regarding the nominal lending interest rate trends, eight banks expect this rate to decline, seven banks expect it to remain at the same level, and none of the banks expects the nominal lending interest rate to increase. The banks’ expectations regarding the effective interest rates are the same.

Graph 9



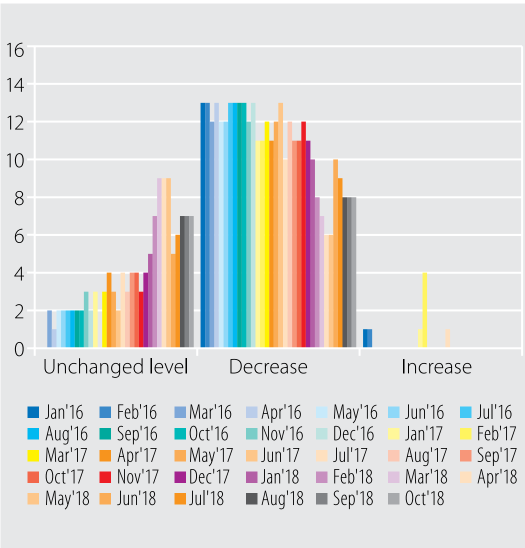
Graph 10



In reference to deposit interest rates trends, nine banks expect no change, six banks expect a decline, while none of the banks expects an increase in deposit interest rates.

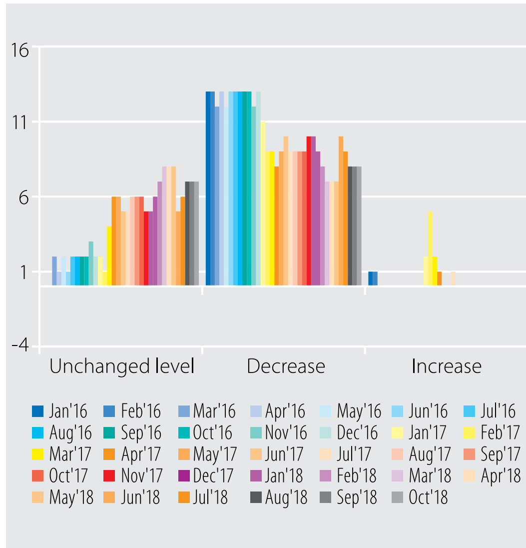
Graph 11

Expectations regarding nominal lending interest rates trends



Graph 12

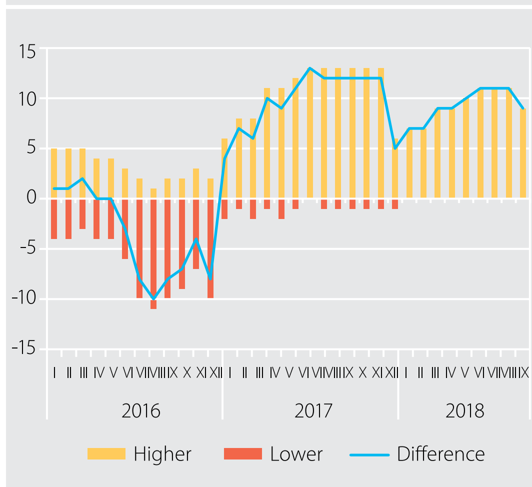
Expectations regarding effective lending interest rates trends



For the purpose of calculating inflation forecasts we use market trend indicator (line in Graph 13). It is calculated as the difference between the number of banks expecting inflation growth and the number of banks expecting inflation decrease. If the market trend indicator has a negative value, a decrease in the inflation rate is expected in the upcoming period. If its value is positive, then an increase in the inflation rate can be expected. If it has a zero value, an unchanged inflation rate can be expected in the upcoming period. The more negative its value is, the lower the inflation expectations are, and vice versa, higher positive value means higher inflation level expectations. Inflation expectations were quite high throughout the previous year, even if with some minor oscillations, and the trend extended into the first ten months of 2018.

Graph 13

Market trend indicator



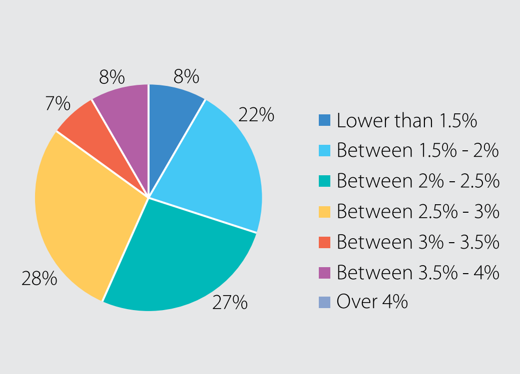
2.2. Expectations of economy (except banks)

Inflation

Out of a total number of surveyed economic entities, the main portion (28%) expected the 2018 inflation to range between 2.5% and 3%. Inflation in the range of 2% to 2.5% was expected by 27% of companies, while 22% of surveyed economic entities expected the inflation to range between 1.5% and 2%. Inflation below 1.5% or ranging between 3.5% and 4% was expected by 8% of companies, respectively. Inflation in the range of 3.5% to 4% was expected by 7% of the surveyed companies. None of the surveyed companies expected inflation above 4% (Graph 14).

Graph 14

Expected inflation in 2018 in relation to 2017

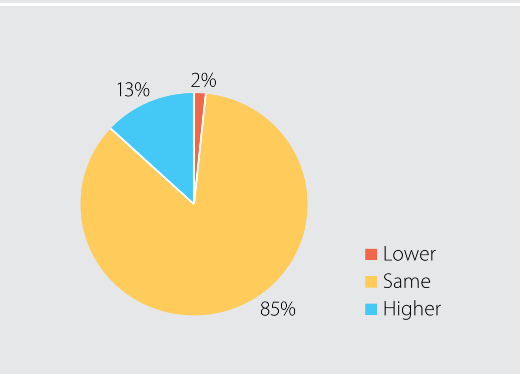


As much as 85% of surveyed companies expected wages and salaries to remain unchanged in 2018, 13% of the surveyed companies expected them to increase, while 2% expected wages and salaries to decline in relation to the previous year. With regard to the number of employed persons, 64% of surveyed companies expected it to remain unchanged, 31% expected this number to increase, and 5% expected it to decrease in relation to the previous year.

The majority of surveyed economic entities (55%) did not expect changes in the prices of production inputs, whereas 83% did not plan to change the prices of their products (services) in 2018.

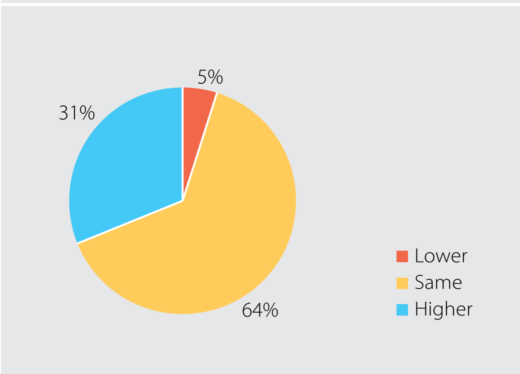
Graph 15

Expected wages and salaries in 2018 in relation to 2017



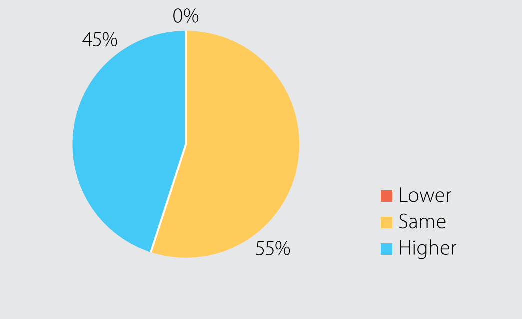
Graph 16

Expected number of employees in 2018 in relation to 2017



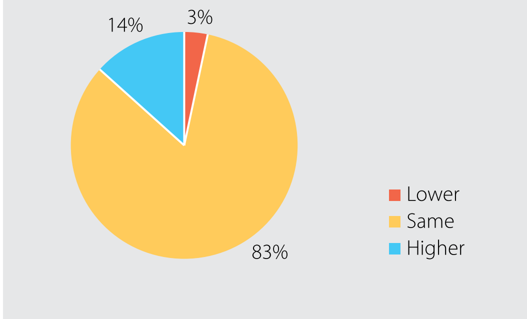
Graph 17

Expected level of production input prices in 2018 in relation to 2017



Graph 18

Expected level of prices of products (services) in 2018 in relation to 2017



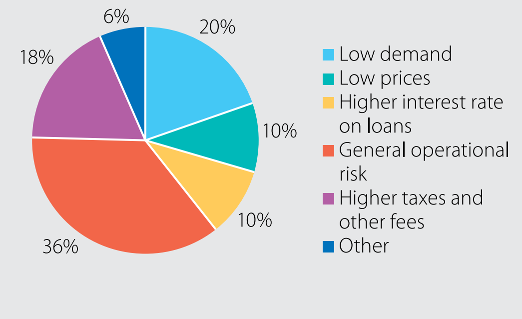
Business Environment

In the area of business barriers, survey results showed that most of the surveyed companies saw general operational risks (36%), low demand (20%), and high taxes and other forms of duties (18%) as main obstacles.

With regard to lending interest rates, 61% of surveyed companies expected unchanged levels, 37% expected them to decline, while only 2% expected higher lending interest rates in 2018 relative to 2017.

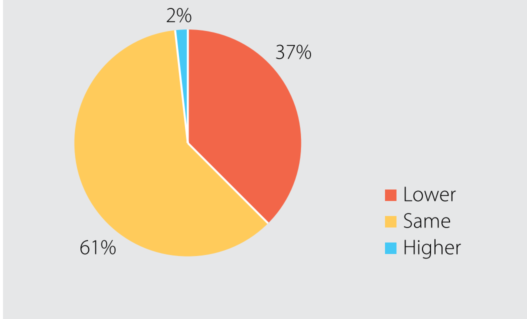
Graph 19

Business barriers



Graph 20

Expected lending interest rates in 2018, in relation to 2017

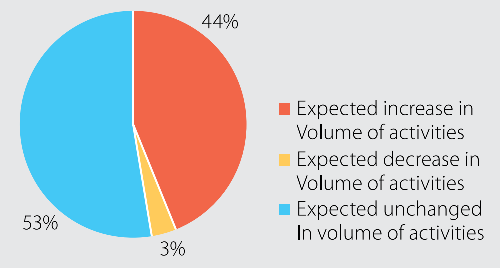


Investments

Out of a total number of surveyed companies, 44% planned the increase in the volume of activities in 2018, while 64% planned new investments. Most investments (52%) referred to increasing the fixed assets,and in reference to the main barriers to new investments the surveyed entities stated the following: insufficient exploitation of existing capacities, high interest rates, and unfavourable conditions for capital borrowing.

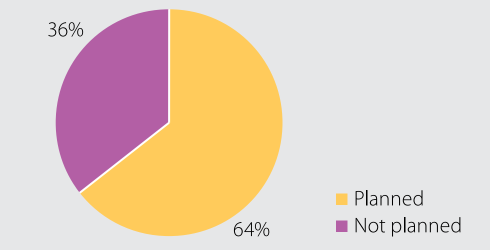
Graph 21

Expected volume of activities in 2018



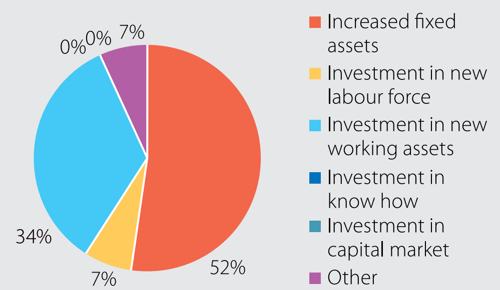
Graph 22

New investments in 2018



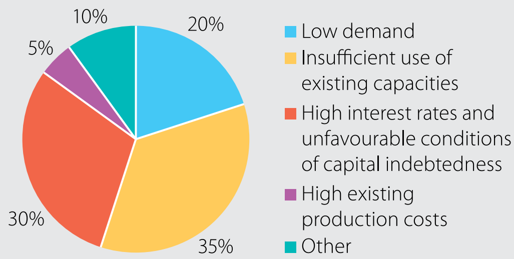
Graph 23

Types of new investments planned in 2018



Graph 24

Barriers to new investments in 2018



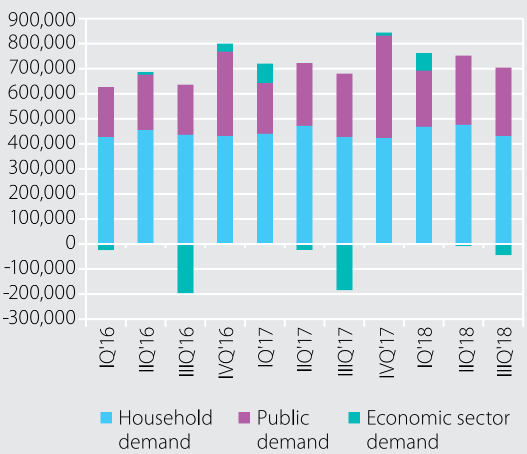
3. INFLATION DETERMINANTS

3.1. Demand

According to preliminary data, aggregate demand recorded quarterly decline as well as the year-on-year growth in Q3 2018 Comparison of the total demand structure in Q2 and Q3 of 2018 shows a decline in corporate sector demand, and an increase in the public spending as well as in household demand.

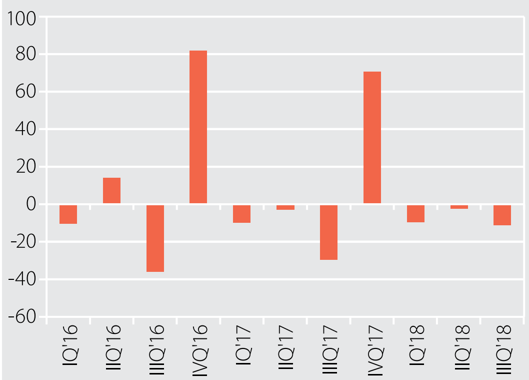
Graph 25

Aggregate demand, in thousand euros



Graph 26

Quarterly aggregate demand rates



Box 1 - Aggregate demand calculation methodology

For the purpose of a more complete monitoring of aggregate demand as a determinant of inflation, the CBCG has developed the aggregate demand calculation methodology. The starting point of this methodology states that the aggregate demand represents the sum of the demand of three sectors: personal spending (households), investment spending (corporate sector), and public spending. However, taking into account the lack of numerous data necessary for calculating the aggregate demand, the existing data should not be treated as the indicator of the exact amount of aggregate demand, but as an indicator showing the aggregate demand trend. In the existing methodology, a number of substantial data were not available, such as: corporate investments, revenues from share sales, non-market income, non-observed economy revenues, and the like. Methodology of aggregate demand calculation is expressed by the following equation:

$$AD = C + I + G$$

C = sum of paid salaries + sum of paid pensions + paid frozen foreign currency deposits + net compensations to households – net household savings (savings – loans granted)

I = -net savings of economy (deposits – loans)

G = public spending – paid pensions – salaries paid from the budget – net Government savings (deposits – loans – Treasury bills)

AD – aggregate demand, C – personal spending, I – investment spending, G – public spending

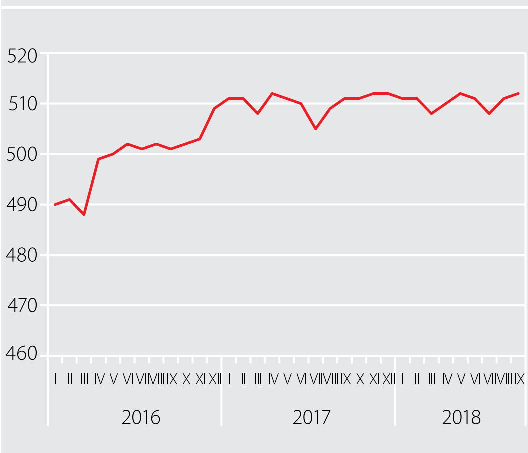
3.1.1. Salaries and other available demand determinants

In Q3 2018, an average gross salary in Montenegro amounted to 765 euros, while an average salary without taxes and contributions amounted to 501 euros. In relation to the previous quarter, the average gross and net wages and salaries declined by 0.2% and 0.1%, respectively. Compared to Q3 2017, the average salary and the average salary without taxes and contributions rose by 0.3% and 0.4%, respectively.

Taking into account the consumer prices, i.e. trends in wages and salaries in real amounts, it can be concluded that in Q3, the real wages and salaries grew in August and September, while they declined in July.

Graph 27

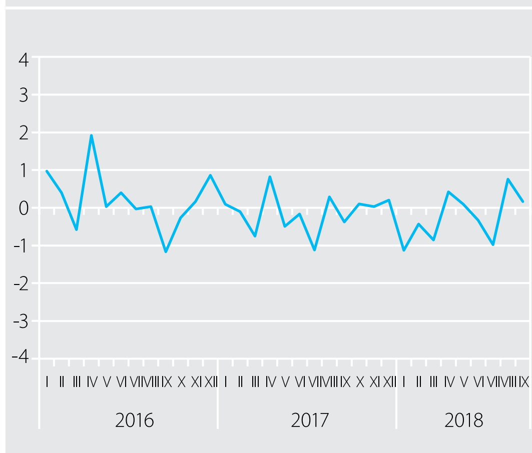
Average wages and salaries without taxes and contributions in Montenegro



Source: MONSTAT

Graph 28

Real wages and salaries (monthly growth rate)



Source: MONSTAT

Over the first nine months of 2018, lending to the retail (household) sector[5] was on an uptrend. Loans granted to this sector grew at he average monthly rate of 0.94%, while a year ago, they grew at the average rate of 0.92%. At the end of the observed period, total retail sector loans amounted to 1,215 million euros, or by 98.1 million euros or 8.8% more than at end-2017, i.e. by 117.1 million euros or 10.7% more than in the same period of 2017 (Graph 29).

At end-September 2016, debt per capita amounted to 1,952 euros, rising by 158 euros in relation to end-2017, and by 188 euros y-o-y.[6]

Total micro-credit financial institutions' (MFIs) loans disbursed to households amounted to 60.3 million euros at end-September 2018 which was by 2.6 million euros or 4.6% more than at end-2017, and by 4.9 million euros or 8.8% higher than a year ago.

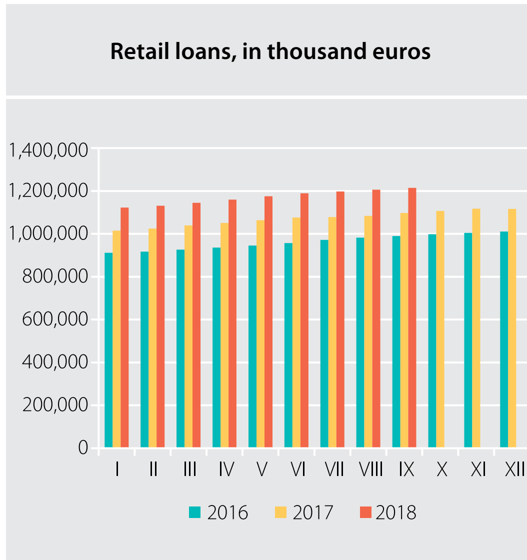
At end-September 2018, retail sector deposits amounted to 1,308.7 million euros, which is by 76.9 million euros or 6.2% more than at end-2017, or by 111.3 million euros or 9.3% more than in the same period of the previous year.

At end-September 2018, loans to deposits ratio for this sector was 0.93. The ratio increased compared to end-2017 when it amounted to 0.91, as well as in relation to the same period of 2017 when it stood at 0.92.

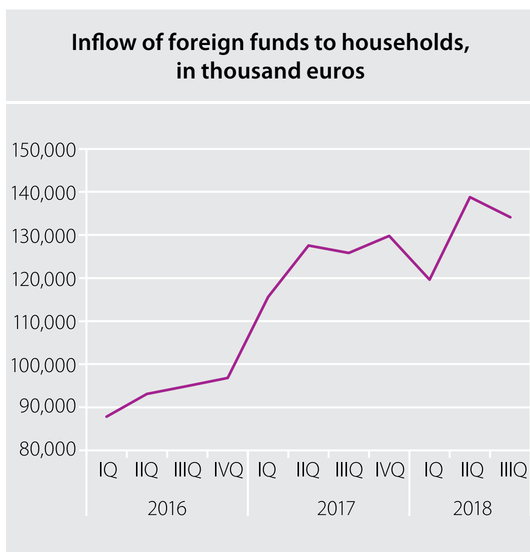
Retail sector reported total net savings in the amount of 93.7 million euros at end Q3 2018. Net savings were by 21.3 million euros or 18.5% lower than at end-2017, and by 5.8 million euros or 5.9% lower y-o-y.

In the reporting period, the balance of payments statistics reveals a mild quarterly decline in the inflow of monetary resources arising from compensations to employees and from remittances.

Graph 29



Graph 30



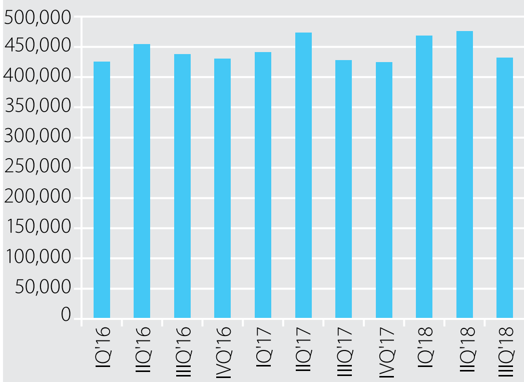
Source: CBCG

[5] The retail sector includes resident natural persons and entrepreneurs.

[6] Population estimate for 2018: Estimate as at 1 January (2018), Source: MONSTAT

Graph 31

Household demand, in thousand euros



Observation of the total retail sector demand by quarters shows that household demand in Q3 2018 recorded quarterly decline and a year-on-year increase.

3.1.2. Budgetary analysis

The Ministry of Finance preliminary data reveals that, over the nine months of 2018, total revenues[7] of the Budget of Montenegro amounted to 1.93 billion euros.

Source revenues amounted to 1.27 billion euros or 27.6% of projected GDP[8], keeping up with the plan, and recording a year-on-year increase of 14.1%. In the structure of source revenues, tax revenues accounted for the main share of 63.3%, followed by contributions with 27.6%, other revenues with 4.8%, fees with 1.5%, donations with 1.4%, duties with 1%, and receipts from loan repayment with 0.4%.

Tax revenues amounted to 806 million euro, recording a year-on-year increase of 11.8%, yet being only 0.5% above the plan. All taxes rose in relation to the corresponding nine months of 2017. In nominal terms, the highest year-on-year increase in revenues was seen in value added tax (VAT), in the amount of 58 million euros or 14.4% as a result of the increase in the standard VAT rate (from 19% to 21%). Significant rise in revenues was also observed in corporate income tax, in the amount of 19.3 million euros or 42.7% due to increased economic activity.

Revenues from contributions amounted to 351.3 million euros being just under the plan, and rising by 6.2% y-o-y.

In the nine months of 2018, *consolidated budget expenditure* stood at 1.30 billion euros or 28.1% of GDP. Expenditure recorded was by 5.8% below the plan for the nine months of the current year, and by 6.3% or 77 million euros higher y-o-y. This was mainly due to the capital budget increase of 43.5

[7] Revenues include source revenues (direct and indirect taxes and non-tax revenues), borrowings and loans, and revenues from sale of property.

[8] Source: Ministry of Finance; estimated GDP for 2018 amounts to 4,604.5 million euros

million euros and the 28.3 million euros increase in transfers to institutions, individuals, NGOs and the public sector.

Current budget expenditure stood at576 million euros, being by 1.6% below planned, and rising by 3.4% in relation to the corresponding period of 2017.

Montenegro's capital budget amounted to 144.6 million euros or 3.1% of GDP.

For the first nine months of 2018, Montenegro's fiscal *deficit*[9] was estimated at 22.6 million euros, or 0.5% of GDP.

Graph 32

Fiscal surplus/deficit, 2009 – September 2018, in million euros

Source: Ministry of Finance

3.1.3. Non-financial sector[10]

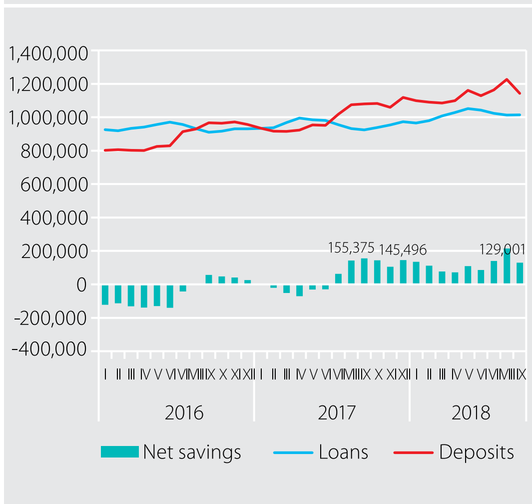
Due to the lack of data on the non-financial sector investments, we can use the sector's net indebtedness as an approximation.

At end- September 2018, loans to non-financial sector were lower than this sector's deposits. At end-Q3 2018, the net savings of the non-financial sector amounted to 129 million euros (Graph 33)

Long-term loans accounted for the main share of 74.4% in the structure of the non-financial sector loans at end-Q1 2018, suggesting that loans to corporate sector were mainly used for increasing economic activity volume.

Graph 33

Net savings of the non-financial sector, in thousand euros



[9] The *surplus/deficit* calculation methodology OGM 53//09. Deficit represents the difference between source revenues and consolidated expenditure.

[10] The non-financial sector includes state companies and private companies.

3.1.4. External demand and the current account

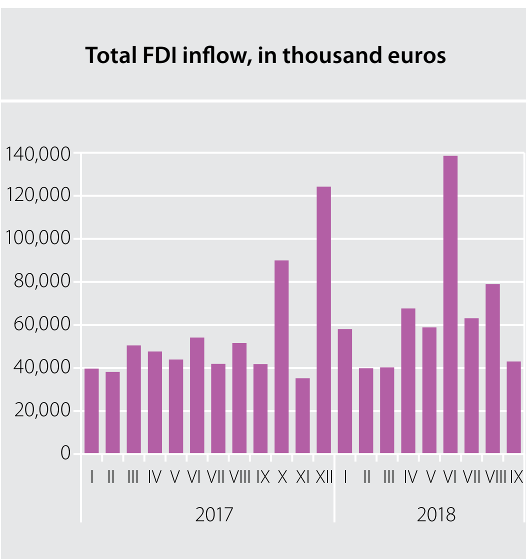
Between January and September 2018, current account deficit experienced considerable increase, fuelled by the goods account deficit widening and the primary income account surplus narrowing. According to preliminary data, the current account deficit stood at 416.6 million euros widening by 32.2% in relation to the same period of 2017 induced by the deepening goods account imbalance, i.e. absolute growth of visible imports considerably exceeding that of exports.

In the period January-September, the goods account ran a deficit of 1.5 billion euros or by 12.6% more than in 2017. Total visible exports stood at 312.7, increasing by 11.3%, while the value of goods imported at the same time was 1.8 billion euros, which represents a 12.4% increase y-o-y. The rise in visible imports was fuelled by higher domestic demand for the implementation of infrastructure projects, as well as other significant projects in the field of energy and tourism.

In the observed period, the services accounts run a surplus in the amount of 897.3 million euros, or by 11.2% more y-o-y. Total service revenues amounted to 1.3 billion euros or by 12.4% more than in the observed period of 2017 mainly as a result of the 8.3% (930 million) increase in the travel/tourism revenues. Expenditure recorded at the same time amounted to 433.7 million euros (rising by 14.9%).

Primary income account surplus amounted to 28.8 million euros, narrowing by 59.1% y-o-y. Revenues arising from primary income stood at 219.3 million euros or 6.8% more compared to the previous year. In the observed period, total expenditure rose by 41% adding up to 190.5 million euros, as a result of the increased outflow based on compensation to employees and paid dividends and interests. Secondary income account ran a surplus of 184.5 million euros, or 13% more y-o-y.

Graph 34



Source: CBCG

Preliminary data suggests that net foreign direct investments (FDIs) inflow for the period January-September amounted to 218.4 million euros, which is a year-on-year decline of 29.9%. Such downturn was caused by a considerable year-on-year increase in the outflow arising from intercompany debt repayment, as well as in the withdrawal of one large company's equity investments. The drop in the net FDI inflow was significantly subdued by the increase in the total FDI inflow (by 43.7%) recorded at the same time.

Total FDI inflow stood at 588.8 million euros, with equity investments amounting to 365.5 million euros (63.3% increase), and the inflow in the form of intercompany debt adding up to 203.8 million euros or 15% more y-o-y. The inflow of monetary resources arising from the withdrawal of residents' funds invested abroad amounted to 19.6 million euros (3.3% of total inflow).

In the period January-September 2018, *portfolio investments* account recorded net inflow of 102.8 million euros, while the net inflow in the *other investments* account amounted to 173.4 million euros. The developments in the other investments account included the increase in liabilities arising from loans taken, borrowings, as well as the rise in banks' deposits abroad.

3.2. Supply and production

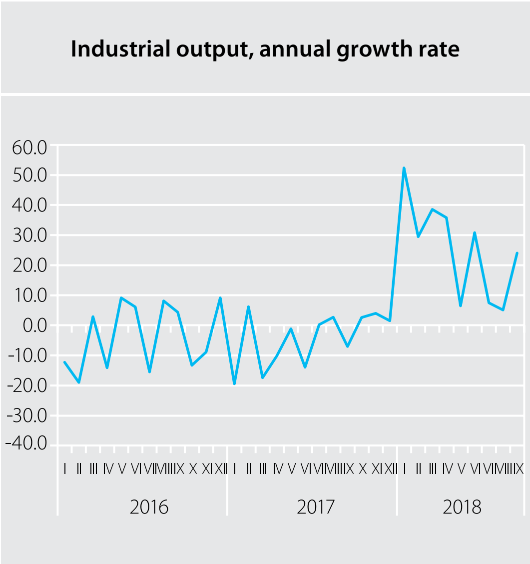
In the first nine months of the current year, total industrial output rose by 24.4% y-o-y. Manufacturing industry and electricity, gas and steam supply sectors recorded respective output growths of 5.3% and 84.8%, while the mining and quarrying sector recorded output decline of 18.6%. Observation of monthly data on the industrial output trends shows that the most prominent growths was recorded in February (13.7%) and June (13.4%) while the most significant declines were seen in May (-17%) and April (-16.3%).

During the first nine months of this year, a total of 926,741 tourists stayed in collective accommodation establishments, which is an increase of 12.4% y-o-y. The number of domestic tourists arrivals in collective accommodation establishments increased by 6.1%, while the number of foreign tourists arrivals grew by 13.2%. Tourist overnight stays amounted to 3.8 million, which is an increase of 7.5% y-o-y.

In the first nine months of 2018, total output of forest assortments amounted to 212,078m³, which represents a year-on-year drop of 13.6%[11].

As per preliminary data, the value of executed construction works for the first nine months of this year was 498.2 million euros increasing by 31.5% y-o-y, while construction activity measured by effective working hours expanded by 14.9%.

Graph 35



Source: MONSTAT

In the first nine months of 2018, air passenger and freight transport recorded year-on-year increases of 12.6% and 5.9%, respectively. Over the same period, year-on-year increase of 0.7%[12] was observed in road passenger transport, while road freight transport decreased by 2.3%[13]. Passenger railway transport rose by 7%[14], while freight railway transport dropped by 38.1%[15].

[11] Presented through weighted index, while presented through non-weighted index production declined by 13% over the same period.

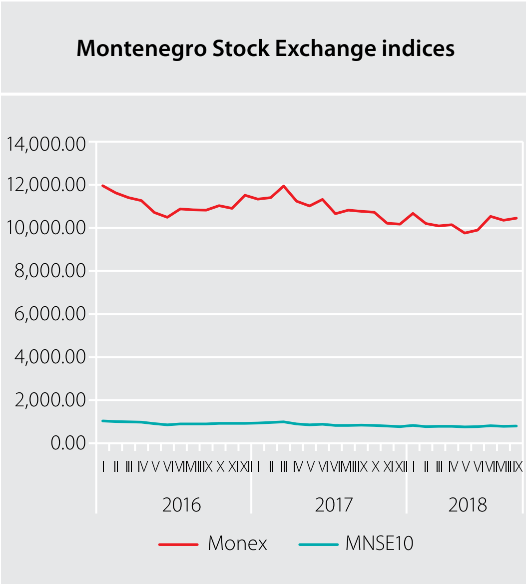
[12] Presented as the number of passengers, while presented in passenger-kilometres, it increased by 1.3%.

[13] Presented in transported goods in thousand tonnes, while presented in ton-kilometres, it declined by 30.3%.

[14] Presented as the number of passengers in thousands, while presented in passenger-kilometres, it increased by 13.3%.

[15] Presented in thousand tonnes, while presented in ton-kilometres, it decreased by 29.1%.

Graph 36



Source: Montenegro Stock Exchange

3.3. Stock exchange indices

At end-Q3 2018, the Monex and MNSE10 indices recorded growth in relation to end-2017. Year-on-year comparison reveals a decline in both indices (Graph 36).

At end-September, the Monex SE index[16] amounted to 10,455.09 rising by 279.66 index points or 2.7% in relation to end-2017, and declining by 317.44 index points or 2.9% y-o-y.

The MNSE10 index[17] stood at 798.38 at end-Q3 2018 rising by 21.69 index points or 2.8% compared to the end of 2017. Compared to the same period of the previous year this index was lower by 33.23 index points or 4.3%.

[16] The MONEX is a benchmark Montenegro Stock Exchange index aimed at providing a more precise description of the share price trends in the official and in the free market of Montenegro Stock Exchange AD Podgorica. With the new Methodology, the legal heir of the MONEX20 index - MONEX index - has more companies in its index basket.

[17] The MNSE10 is the blue-chip index at the Montenegro Stock Exchange and it is aimed at providing a more precise description of the price trends of the most representative shares in the official and the free market of the Montenegro Stock Exchange AD Podgorica. It includes the top ten companies in the Montenegrin market.

4. MONETARY POLICY

In Q3 2018, there were no changes to the existing decisions, nor were new ones passed regarding the Central Bank of Montenegro monetary policy instruments.

5. INFLATION FORECAST FOR 2018 AND Q1-Q3 2019

5.1. Model assessment

Montenegro's inflation fan chart is a graphic representation of inflation rate forecast probability distribution presented by the consumer price index. In that respect, instead of determining specific points, the fan chart also takes into account potential risks and uncertainties through probability distribution that might influence the inflation trends in the upcoming period. The purpose of the fan chart is to indicate and consider the uncertainties in the real economy flows, which are consequently reflected in the inflation rate trend (increase in energy prices, increase/ decrease in the foreign trade deficit, etc.).

Fan Chart graph for 2018 and three quarters of 2019 is based on three estimated constituent parts:

1. **Central projection values** – the values of the fan chart central projection are derived from the ARIMA (Autoregressive Integrated Moving Average) model;
2. **Degree of uncertainty** – determines the fan chart width. The uncertainty degree ratios are obtained through analytical assessment and calculation of the relative impact of potential internal and external shocks that are possible in the Montenegrin economy over the one-year period and which are reflected through the "thickness" of the band around the central projection.
3. **Fan chart skewedness** – based on the level of skewedness of the distribution of inflation projection, the fan chart is adjusted to the forecast to show whether the values of the central projections have "overestimated" or "underestimated" inflation rates. The position of the mean value of inflation distribution will depend on this.

Central projection of fan chart - ARIMA model for 2018 and Q1-Q3 2019

With a view to developing a fan chart, an ARIMA model of time series of inflation of Montenegro presented via Consumer Price Index was developed[18].

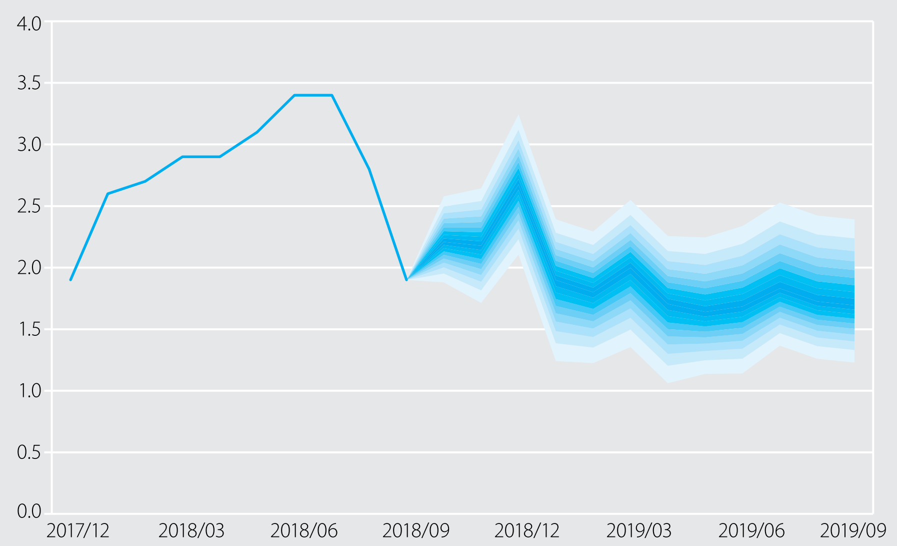
[18] A detailed explanation of the ARIMA model of Montenegro was presented in the CBCG working paper No. 11 "Inflation Forecast". Empirical research on the retail price index trend of Montenegro for 2007 - applying the ARIMA model.

ARIMA model was used for short term forecasts (12 months), whereby several iterations of ARIMA models were made, which were ranked based on their efficiency and quality of diagnostics. The selected ARIMA model, ARIMA (1,1,11)[19] has sufficient confidence level for forecasts.

The monthly forecast value was used as the value of central projection of the CPI graph for 2018 and three quarters of 2019. Obtained values represent the distribution mode, i.e. values with the highest frequency in the distribution of this time series.

Graph 37

Montenegro's CPI projections for 2018 and Q1-Q3 2019



Source: CBCG, 2018

Mean value of the obtained model is 2.1. The value of the coefficient of asymmetry varies in the range of 0.5 to 1, and the relative standard deviation is 0.25. Model projection of inflation is located in the central span of the distribution. The fan chart describes 90% probability of inflation distribution. The central projection is usually in the deepest shade of the fan chart, i.e. in the central 10% of probability.[20] The fan chart has an equal number of bands (eight) on either side of the central band whereby every band of the same colour, both above and below the central band, cumulatively describes the next 10% of inflation trend probability. As uncertainty grows over time, the fan chart spreads.

[19] ARIMA model is generally referred to as an ARIMA (p,d,q) where p represents the number of autoregressive variables, d refers to the level of dependent variable that needs to be made stationary, and q is the number of variables, moving averages, in the certain model.

[20] The mode values (central projection) are usually in the deepest band shade, but in case of a significant risk level, it can happen that the central projection does not cover either of these values. (Britton, E, Fisher, P.G. and Whitley, J.D. (1998), 'The Inflation Report projections: Understanding the Fan Chart', Bank of England, Quarterly Bulletin, 38, pp. 30–37)

The fan chart of inflation in Montenegro, based on the ARIMA model assessment for Q4 2018 and Q1-Q3 2019, indicates that there is a *90% probability that the CPI inflation will range between 1.1% and 3.2%, depending on the month, with the central projection of 2.1%.*

Average inflation of 2.8% is forecasted for 2018, while the inflation forecasts for December 2018 suggest a range between 2.1% and 3.2%, with the central trend of 2.6%. For the three quarters of 2019, inflation is forecasted to range between 1.1% and 2.6%, with the central trend of 1.8%. The fan chart central projection (the darkest part) represents a 10% probability span (Graph 37).

The starting assumptions for forecasting inflation in 2018 and three quarters of 2019 are the following:

The risks related to the projected inflation rate shown on the fan chart have been set symmetrically. Inflation rate above projected could be induced by a more vigorous growth in oil prices in the international market due to geopolitical tensions and strengthening of trade protectionism. Price growth could also be fuelled by bad weather conditions, which affect the food and electricity price growth. On the other hand, the risks that would contribute to a lower inflation rate relate to a stronger decline in oil prices, as well as the euro area inflation growth below the projections.

Internal factors:

- Increase in the excise duties on ethyl alcohol and carbonated beverages with added sugar in 2019.
- Increase in coal excise duties in 2019.
- Potential 5% increase in the prices of electricity due to the rise in coal excise duties.
- Fluctuation of +/-5% in the agricultural product prices, caused by weather conditions.
- A standstill in wages and real estate prices.

External factors:

- Expectations from the forward market point to a crude oil price increase in 2018. Forecasts for 2019 suggest that average price of crude oil in the international market will decline mainly due to supply factors, as well as the announced US output increase.
- Stabilisation and moderate growth of prices of food products in the international market is expected in 2018 and 2019. However, international institutions cited trade dispute between the USA and their major trade partners as the main risk to the food product prices.
- The expansion of economic activity in the euro area did not exert inflationary pressures, thus the European Central Bank (ECB) stands by its expectations of the inflation rate being just below the target (1.7%). Moreover, the ECB announced that it will not change its key interest rates, at least until the summer next year, longer if necessary, with a view to reaching the targeted inflation rate of close to 2%. In reference to the above said, we currently do not expect more significant inflationary pressures from the euro area.

Deviation of any of these parameters would require the forecast to be adjusted.

6. EXPECTED INFLATION IN 2018

The first half of this year was characterized by a somewhat higher inflation rate, as was expected given the impact of internal and external factors. The most important internal factors refer to fiscal consolidation measures that resulted in higher VAT rate and excise duties. As for the external factors, the most prominent is the rise in oil prices on global stock exchanges, which have a strong spillover effect on domestic prices.

Low annual core inflation, which was by 0.7 percentage points below total inflation at end-June, suggests that this is just a one-off occurrence. In addition, inflation growth decelerated in Q3.

Still, the annual inflation rate did not considerably deviate from the rates recorded in other transition economies, even being below the inflation rates experienced by majority of observed countries. This was most probably the result of the higher-than-expected economic growth having an anti-inflationary effect. As regards inflation expectations, the majority of banks and surveyed companies expected inflation in the range of 2.5% to 3%. Moreover, expectations suggest the further decline in interest rates, and growth in output and investments, which will also have anti-inflationary effect.

For end-2018, our model assessment projected inflation in the range of 2.1% to 3.2%, with the central trend of 2.6%. Our expert assessment, which was based on the inflation slowdown in Q3, is somewhat lower. As per the expert assessment, in 2018, inflation will range between 1.5% and 3.5%.

Table 3

Expected inflation rate at end-2018		
Optimistic assessment	Realistic assessment	Pessimistic assessment
1.5	2.5	3.5

This assessment is based on the same assumptions as the econometric assessment and the deviation of any of the assumptions would require its revision.