CENTRAL BANK OF MONTENEGRO

INFLATION REPORT
QUARTER I, 2019

Year XV, Number 45

PUBLISHED BY: Central Bank of Montenegro
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1. INFLATION INDICATORS

Inflation in Montenegro, measured by consumer prices, in March 2019 amounted to 0.7% compared to December 2018, which is largely the result of price increase in the category *food and non-alcoholic beverages* (2.8%), and *transport* (0.8%). Observation of consumer prices monthly trends shows that the price increases were recorded in February (0.4%) and March (0.6%), while prices declined in January (-0.3%). Average consumer prices rate (the first three months of 2019 in relation to the same period of 2018) amounted to 0.5%, while at the annual level, prices increased by 0.8%.

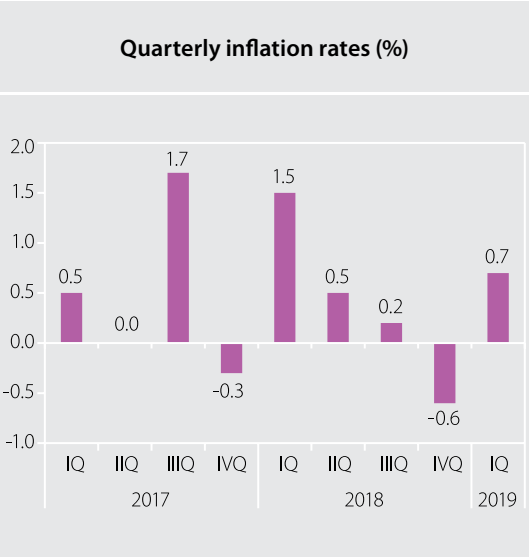
Table 1

Inflation, %					
	2018				2019
	III	VI	IX	XII	III
Change in relation to the previous year-end	1.5	2.0	2.2	1.6	0.7
Annual change	2.9	3.4	1.9	1.6	0.8

Source: MONSTAT

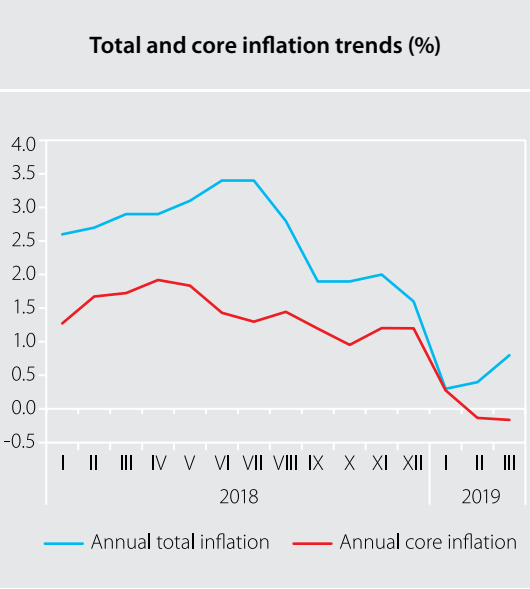
In the first quarter, prices growth was recorded in five out of twelve categories (Table 2). The highest increase in prices was recorded in the category *food and non-alcoholic beverages* of 2.8%, which contributed the most (1.0 percentage points) to total inflation. The growth in this category was mostly affected by the increase in prices of vegetables by 22.4%, fruit by 4.7%, bread and cereals by 1.1% and meat by 0.5%. The prices in the *transportation* category gave a positive contribution of 0.1 percentage points, especially to the increase in the prices of fuels and lubricants for personal transport equipment (1.7%). During this period, prices increased in the categories of *furniture, household equipment and routine home maintenance*, *health* and *other goods and services* of 0.2% each. The largest price decrease was observed in the *clothing and footwear* category (-2.6%), due to a 4% drop in footwear prices and 1.4% in clothing prices.

Graph 1



Source: MONSTAT and CBCG calculations

Graph 2



Source: MONSTAT and CBCG calculations

Declines were also reported in *hotels and restaurants* (-1.8%), *communications* (-0.5%) and *recreation and culture* (-0.2%). In the categories, *alcoholic beverages and tobacco, housing, water, electricity, gas and other fuels* and *education* there were no changes in prices in March this year in relation to December 2018.

During the Q1 2019, the monthly core inflation in all three months of 2019 was lower than the official monthly inflation. Core inflation had a positive rate during February and March, while it was negative in January.

The annual core inflation rate in March 2019 amounted to -0.2% and was lower by 1.0 percentage points than 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.

Table 2

Share of selected categories in total inflation[1]

	Weights	III 19/XII 18	Growth rate	Contribution
TOTAL	**1000.0**	**100.7**	**0.7**	**0.7**
Food and non-alcoholic beverages	351.7	102.8	2.8	1.0
Alcoholic beverages and tobacco	38.6	100.0	0.0	0.0
Clothing and footwear	85.1	97.4	-2.6	-0.2
Housing, water, electricity gas and other fuels	155.3	100.0	0.0	0.0
Furnishing, household equipment and routine household maintenance	41.2	100.2	0.2	0.0
Health	40.9	100.2	0.2	0.0
Transport	107.0	100.8	0.8	0.1
Communication	49.9	99.5	-0.5	0.0
Recreation and culture	33.2	99.8	-0.2	0.0
Education	19.3	100.0	0.0	0.0
Restaurants and hotels	31.3	98.2	-1.8	-0.1
Miscellaneous goods and services	46.5	100.2	0.2	0.0

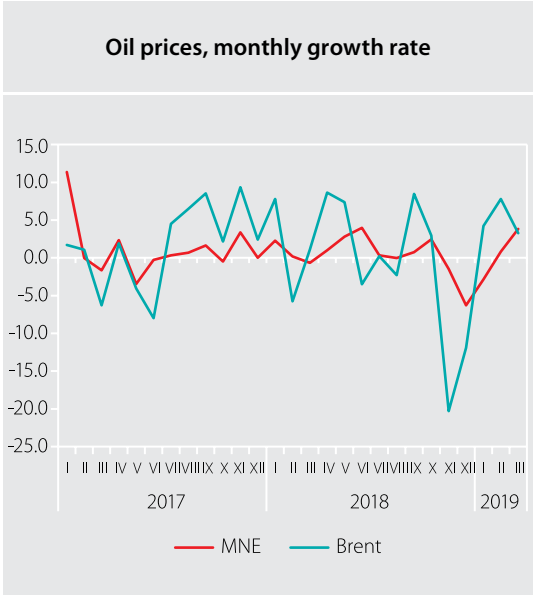
Source: MONSTAT and CBCG calculations

[1] 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

Annual core inflation in February, March and slightly in January was lower than total inflation. (Graph 2)

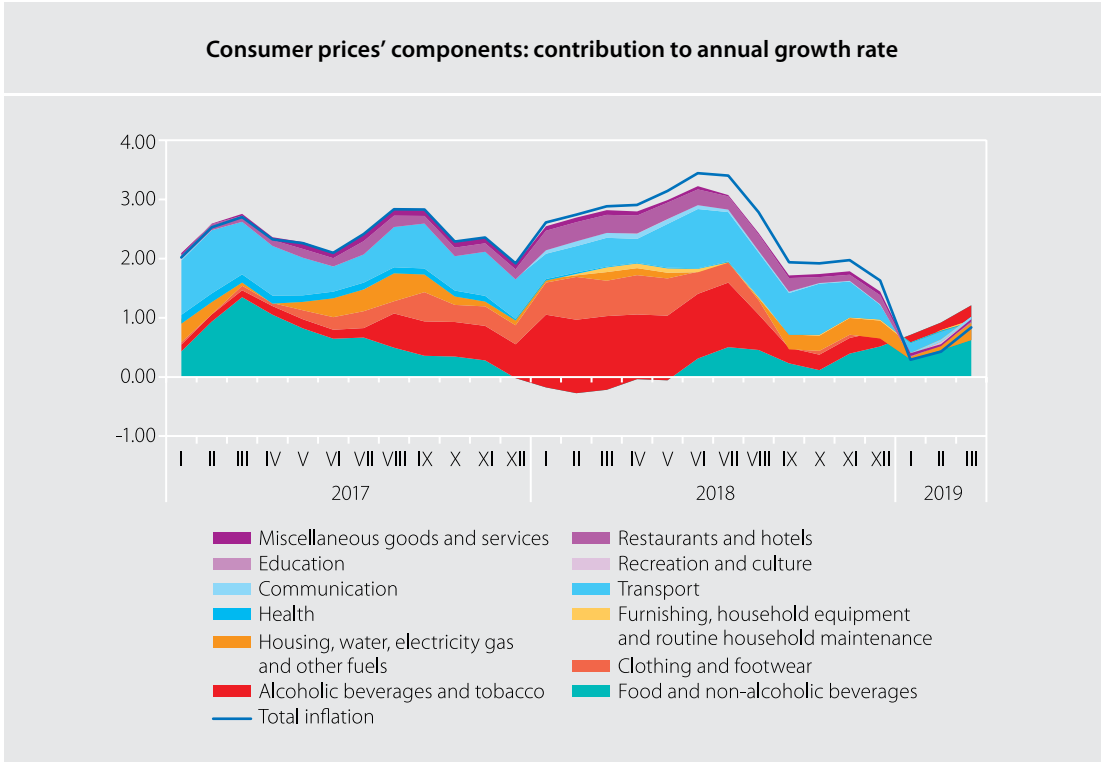
In Q1 2019, the oil prices at global markets declined in relation to Q4 2018. The average price of the OPEC reference basket in Q1 2019 amounted to 63.0 USD/barrel, which is a decrease of 6.3% in relation to Q4 2018. The average price of Brent in Q1 was 63.2 USD/barrel, which is 6.6% less in relation to the price recorded in Q4 2018. At the beginning of the year, OPEC members lowered production again, the USA imposed sanctions against Venezuela, and Canada partially suspended production to reduce large oil reserves.[2] However, less optimistic expectations of global economic growth have weakened the impact of supply cuts.

Graph 3



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

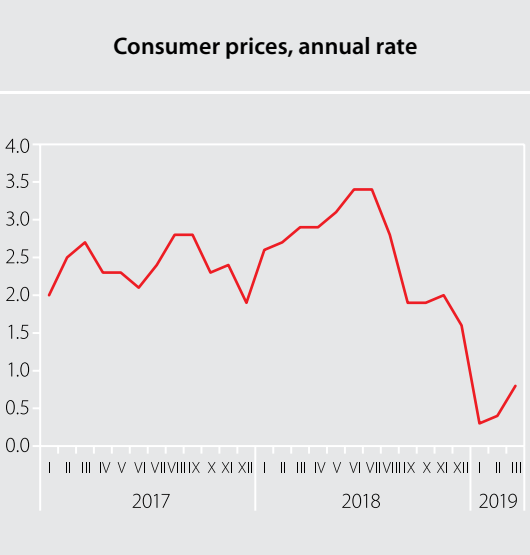
Graph 4



Source: MONSTAT and CBCG calculations

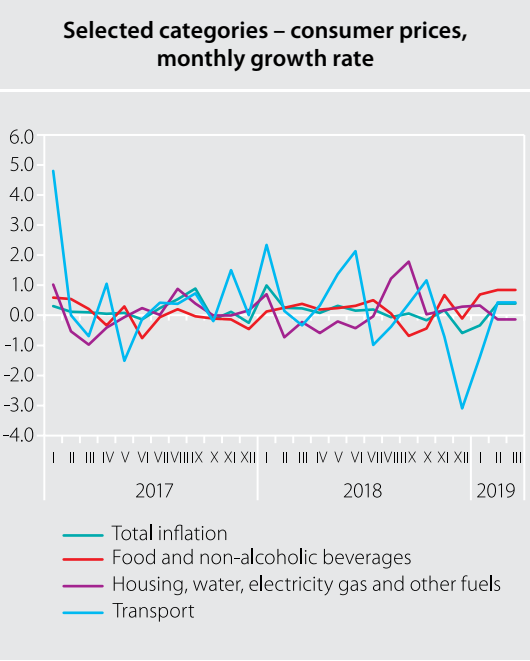
[2] Source: European Commission "European Economic Forecast"- Spring 2019, May 2019

Graph 5



Source: MONSTAT

Graph 6



Source: MONSTAT

Annual prices growth of 3.5% in the *food and non-alcoholic beverages* category gave the largest contribution to the increase (1.2 percentage points) in the total annual inflation rate of 0.8%. Annual price growth were also reported in the following categories: *housing, water, electricity, gas and other fuels* (2.2%), *transport* and *other goods and services* by (0.9%) and *hotels and restaurants* (0.4%). The annual price decline was recorded in *alcoholic beverages and tobacco* (-6,7%), *clothing and footwear* (-3.7%), *recreation and culture* (-1.4%), *communications* (-1,1%), *furniture, household equipment and routine home maintenance* (-0.8%), *health* (-0.3%), while prices in the category *education* remain unchanged.

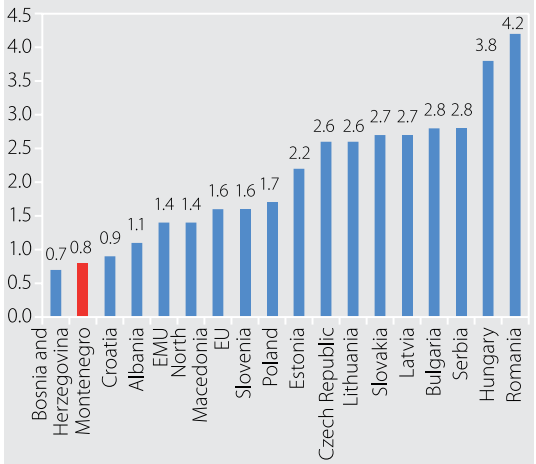
In March 2019, **producers` prices of manufactured products** recorded 0.6% growth in relation to December 2018. This was due to the growth recorded in the mining and quarrying of 2.1% and manufacturing industry of 0.5%, while prices in the sector electricity, gas and steam supply remained unchanged. At the annual level, producers` prices of manufactured products increased by 1.2%.

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 positive annual inflation rate was recorded in Romania (4.2%) while Bosnia and Herzegovina recorded the lowest positive annual inflation rate (0.7%).

The annual HICP inflation rate reported in the euro area amounted to 1.4%, CPI inflation in Montenegro amounted to 0.8%, while annual HICP inflation in Montenegro was 0.7%.

Graph 7

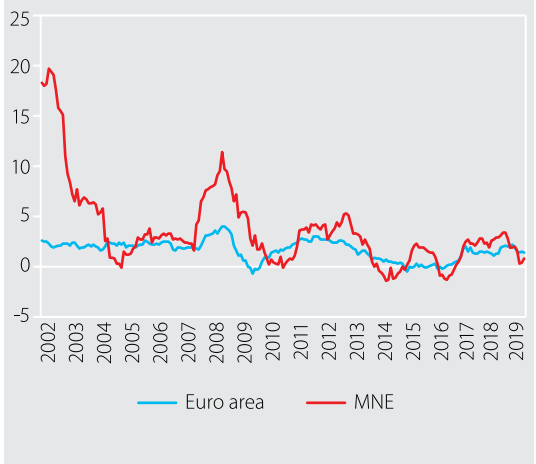
Annual inflation rate in selected countries, March 2019



Source: national statistical offices and Eurostat

Graph 8

Inflation in the euro area (HICP) and Montenegro (CPI)[3] since the introduction of euro (annual rates)



Source: MONSTAT and Eurostat

[3] Costs of living were used for measuring inflation in Montenegro until 2009, after which consumer prices were introduced

2. INFLATIONARY EXPECTATIONS

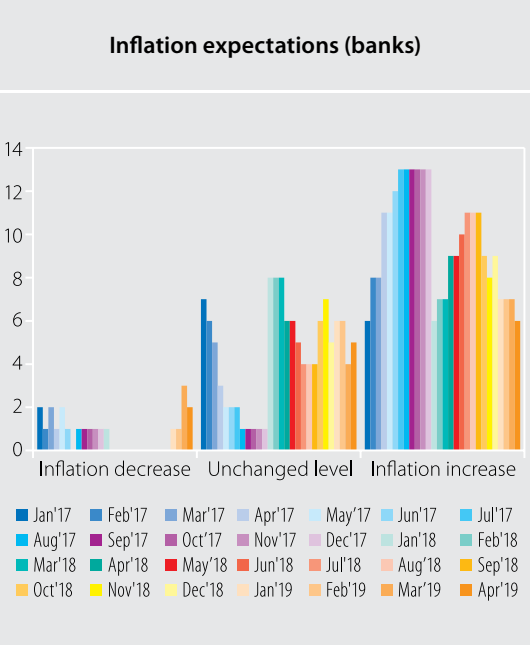
2.1. Banks' expectations

In reference to inflation expectations of banks, based on the survey conducted in April this year, six banks expect inflation to grow, five banks expect inflation at the same level as in 2018, while two banks expect inflation to decline in relation to 2018 (Graph 9).

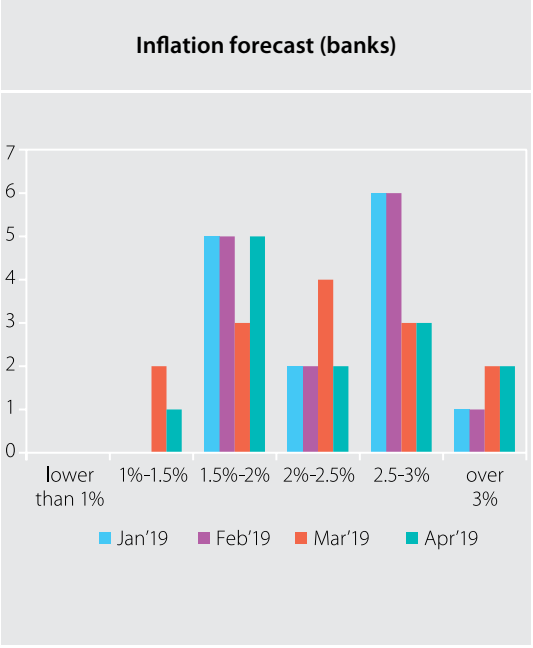
When it comes to inflation levels, expectations varied among banks. Five banks expect inflation level between 1.5% and 2%, three banks expect inflation level between 2.5% and 3%, two banks expect inflation between 2% and 2.5%, or more than 3%, one bank expects inflation between 1% and 1.5%, while no bank expects inflation below 1% (Graph 10).

Concerning the expectations on the nominal lending interest rates trends, ten banks expect this rate to remain at the same level, three banks expect it to decline, and none of the banks expects the nominal lending interest rate to grow. The banks' expectations regarding the effective interest rates are the same.

Graph 9



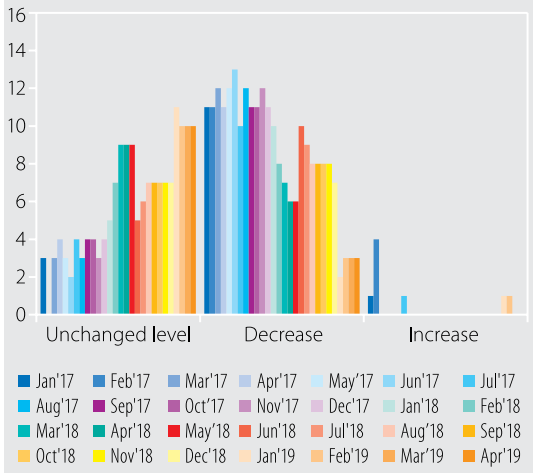
Graph 10



Regarding expectations about the deposit interest rates trend, nine banks expect unchanged deposit interest rates, three banks believe they will decline, while one bank expects their growth.

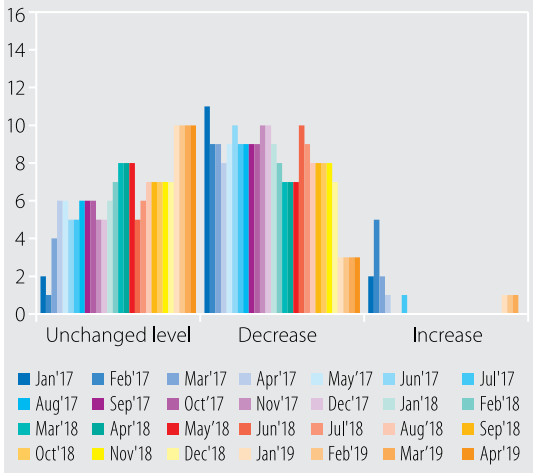
Graph 11

Expectations of nominal lending interest rates trends



Graph 12

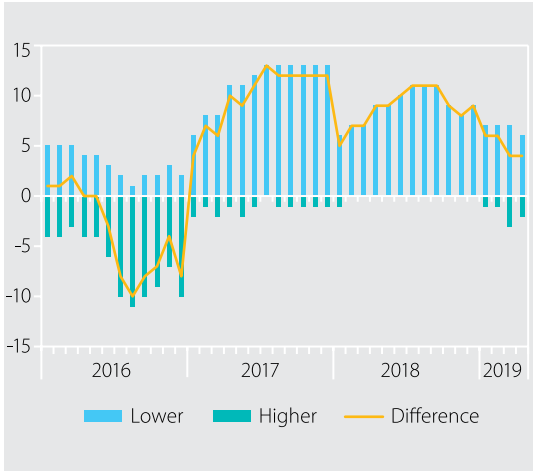
Expectations of effective lending interest rates trends



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 forecast were significantly high in 2018, and in the first four months of 2019 it continued positive trend with minor decline.

Graph 13

Market trend indicator



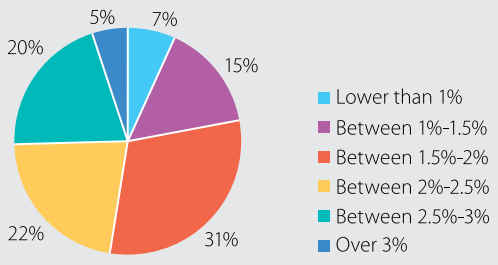
2.2. Expectations of economy (except banks)

Inflation

Out of a total number of surveyed economic entities, the main portion (31%) expected the 2019 inflation to range between 1.5% and 2%. Inflation in the range 2% - 2.5% was expected by 22% of companies, while 20% of surveyed economic entities expected the inflation to range between 2.5% and 3%. Some 15% of companies expected inflation to fluctuate between 1% and 1.5%. Inflation rate lower than 1% in 2019 is expected by 7% of respondents, while only 5% predict inflation over 3% (Graph 14).

Graph 14

Expected inflation in 2019 in relation to 2018

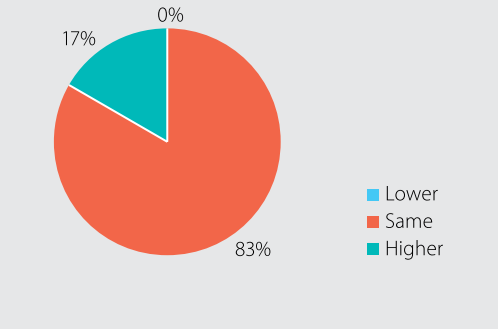


As much as 83% surveyed companies expect wages and salaries to remain unchanged in 2019, 17% of the surveyed companies expect them to increase, while none of those surveyed expect them to decrease. With regard to the number of employed persons, 72% of surveyed companies expected it to remain unchanged, 23% expected this number to increase, and 5% expected it to decrease in relation to the previous year.

The majority of surveyed economic entities (56%) did not expect changes in the prices of production inputs, whereas 76% did not plan to change the prices of their products (services) in 2019.

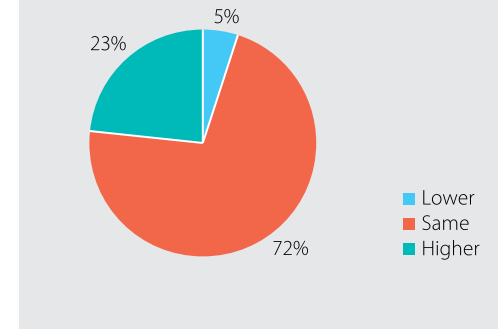
Graph 15

Expected wages and salaries in 2019 in relation to 2018

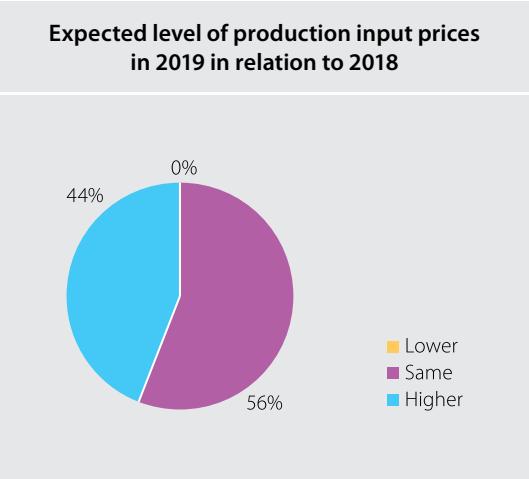


Graph 16

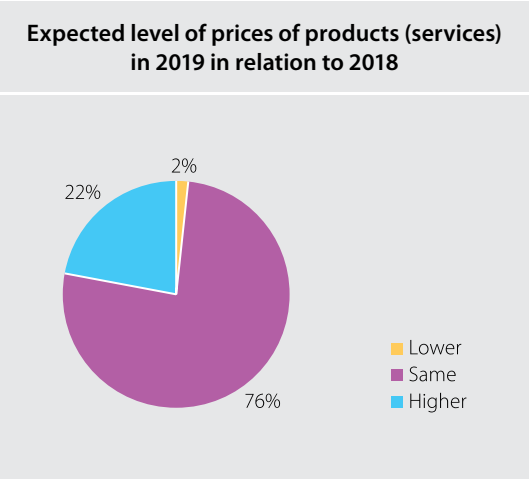
Expected number of employed persons in 2019 in relation to 2018



Graph 17



Graph 18

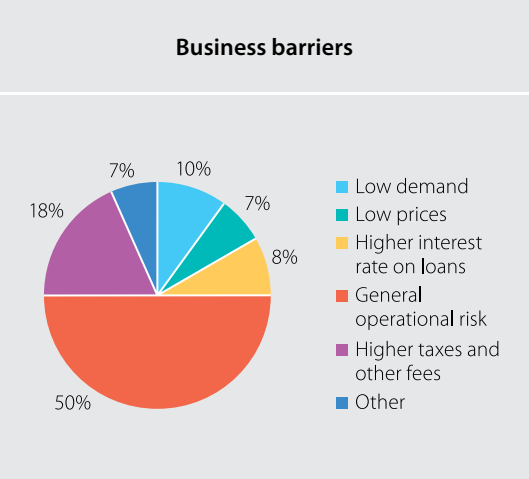


Business Environment

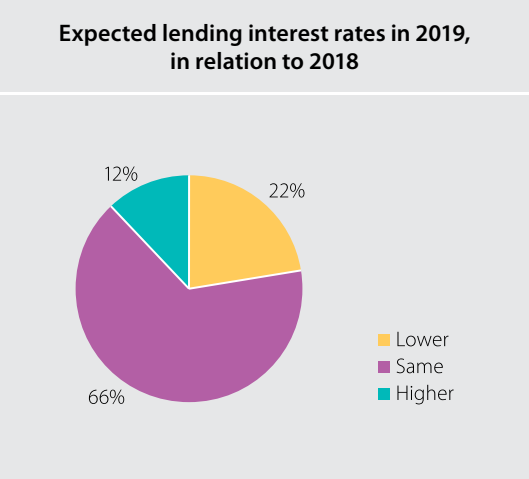
Concerning the business barriers, survey results showed that most of the surveyed companies saw general operational risks (50%), high taxes and other forms of duties (18%) and low demand (10%) as main obstacles.

In reference to lending interest rates, 66% of surveyed companies expected them to remain at the same level, 22% expected them to decrease, while barely 12% expected higher lending interest rates in 2019 relative to 2018.

Graph 19



Graph 20

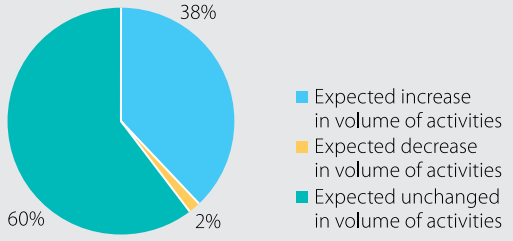


Investments

Out of a total number of surveyed companies, 60% expected unchanged volume of activities in 2019, while 61% planned new investments. Most investments (68%) 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, unfavourable conditions for capital borrowing and other barriers.

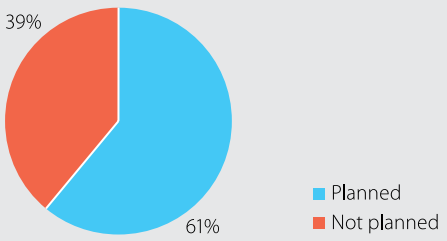
Graph 21

Expected volume of activities in 2019



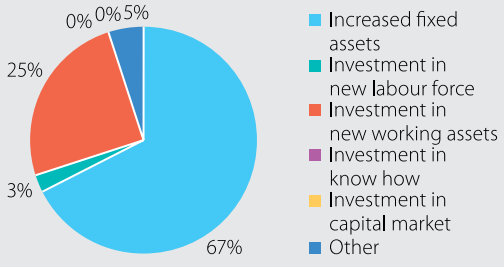
Graph 22

New investments in 2019



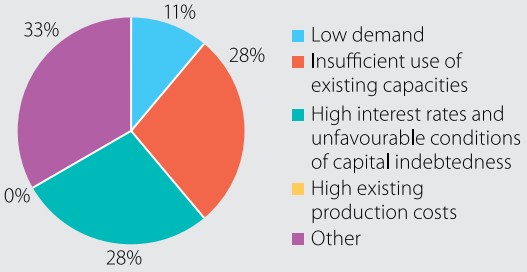
Graph 23

Types of new investments planned in 2019



Graph 24

Barriers to new investments in 2019



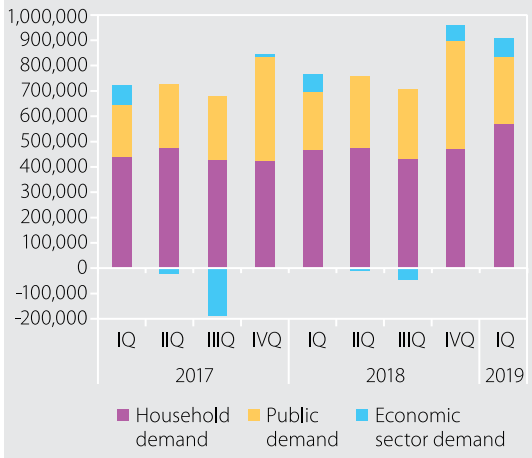
3. INFLATION DETERMINANTS

3.1. Demand

As per preliminary data, in Q1 2019, the aggregate demand recorded a year-on-year increase, yet a decline in relation to Q4 2018. Taking into account the level of total demand in Q1 2019 in relation to Q4 2018, household and corporate sector demand increased, while public spending declined.

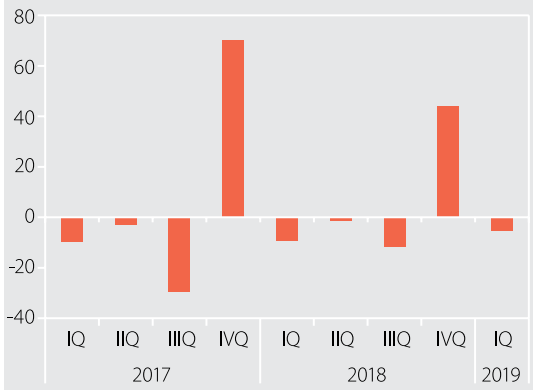
Graph 25

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)

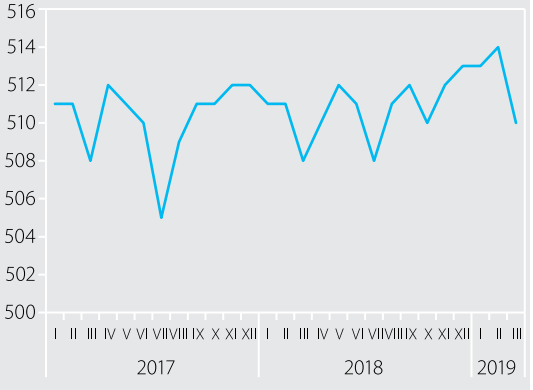
AD – aggregate demand, C – personal spending, I – investment spending, G – public spending

3.1.1. Salaries and other available demand determinants

In Q1 2019, an average gross salary in Montenegro amounted to 769 euros, while an average salary without taxes and contributions amounted to 512 euros. Compared to the previous quarter (fourth quarter of 2018), average gross and net earnings increased by 0.1%. Average wages and salaries recorded year-on-year increase of 0.7% while the average salary without taxes and contributions increased by 0.4%.

Graph 27

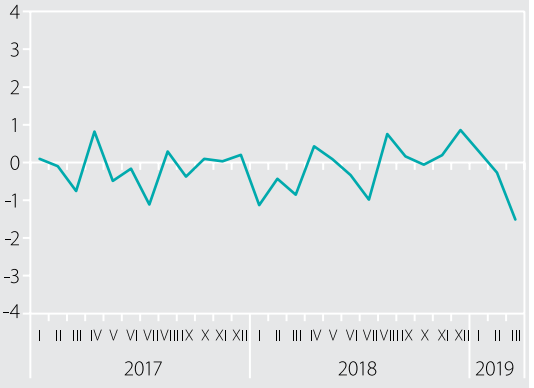
Average wages and salaries without taxes and contributions in Montenegro



Source: MONSTAT

Graph 28

Real wages and salaries (monthly growth rate)



Source: MONSTAT

If we take into account consumer prices, i.e. the wages and salaries trend observed in real terms, it is concluded that real wages and salaries increased in the first month, while they declined in the second and third month of Q1 2019.

Over the first three months of 2019, lending to the retail (household) sector was on an uptrend. Loans granted to this sector grew at he average monthly rate of 0.98%, while a year ago, they grew at the average rate of 0.83%. At the end of Q1 2019, total household sector loans amounted to 1,287.2 million euros, or by 37 million euros or 3% more than at the end of 2018, i.e. by 142.4 million euro or 12.4% more than in same period of 2018 (Graph 29).[4]

At end-March 2019, debt per capita[5] amounted to 2,068.3 euros, recording an increase of 59.5 euros in relation to end-2018, and a year-on-year increase of 228.8 euros.

Total MFIs loans disbursed to households amounted to 63.6 million euros at end-March 2019 which was by 805,000 euros or 1.3% more than at end-2018, and by 3.7 million euros or 6.2% higher compared y-o-y.

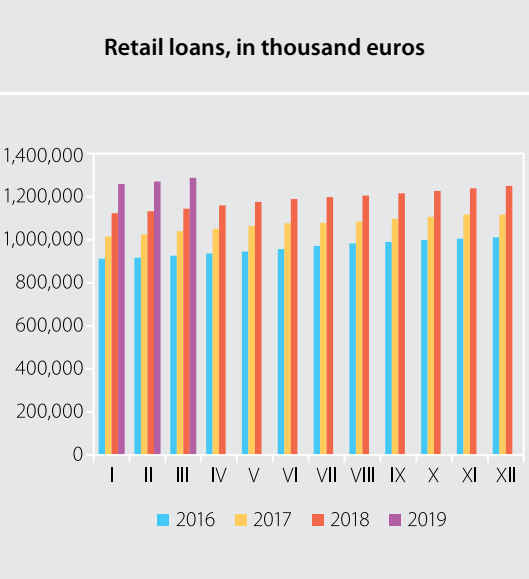
At end-March 2019, this sector's deposits amounted to 1,249.2 million euros, which is by 78.3 million euros or 5.9% less than at the end-2018, or by 16.7 million euros (1.4%) more than in the same period of the previous year.

At end-March 2019, loans to deposits ratio for this sector amounted to 1.03 being higher compared to end-2018 when it amounted to 0.94, as well as in relation to the same period of 2018 when it amounted to 0.93.

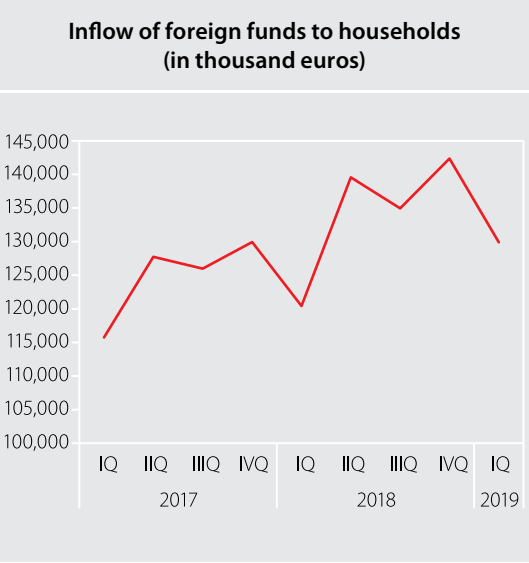
At the end of the first quarter of 2019, the household sector had a net debt of 38 million euros.

In Q1 2019, compared to Q1 2018, the balance of payments statistics show an increase in the in-

Graph 29



Graph 30

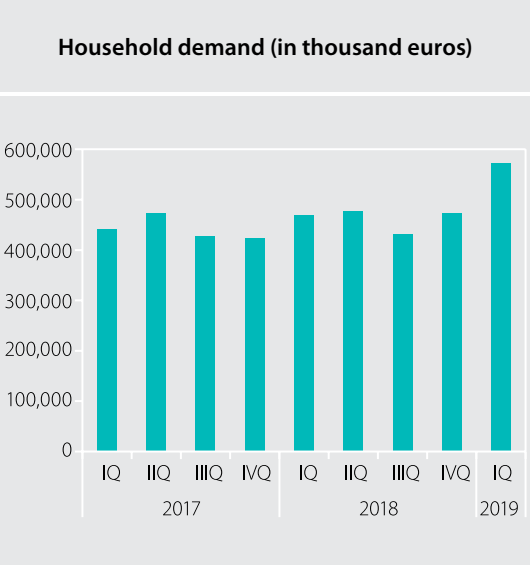


Source: CBCG

[4] The retail sector includes resident natural persons and entrepreneurs

[5] Population estimate for 2019: Estimate as at 1 January 2019 amounts to 622,182, Source: MONSTAT

Graph 31



flow of cash arising from foreign remittances to households.

Observation of the total retail sector demand by quarters shows that household demand in Q1 2019 was higher compared to the previous quarter and compared y-o-y.

3.1.2. Budgetary analysis

According to Ministry of Finance preliminary data, total revenues[6] of the Budget of Montenegro amounted to 487.4 million euro in Q1 2019.

Source revenues amounted to 371.3 million euros or 7.7% of estimated GDP[7], and they increased by 4.7% in relation to the plan, and they showed a year-on-year increase of 13.4%. In the structure of source revenues, tax revenues accounted for the main share of 64.5%, followed by contributions with 26.8%, donations with 4.1%, other revenues with 1.9%, fees with 1.7%, duties with 0.8%, and receipts from loan repayment with 0.2%.

Tax revenues amounted to 239.6 million euros, recording a year-on-year increase of 11.8%, yet being 6.1% above the plan. All taxes increased compared to the first quarter of the previous year. In nominal terms, the highest growth of revenues in relation to the previous year was recorded in value added tax in the amount of 19.6 million euros or 16.4% as a result of the increase of the standard VAT rate by 2 percentage points.

Revenues arising from contributions amounted to 99.5 million euros being 3.9% above planned, and recording a year-on-year growth of 5.2%.

In the three months of 2019, *budget expenditures* amounted to 442.7 million euros or 9.2% of GDP. Compared to the plan for three months of the current year, the expenditures were lower by 14.7%, yet being higher by 11.4% or 45.2 million euros y-o-y, mainly due to the increased capital budget by 29.5

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

[7] Source: Ministry of Finance; estimated GDP for 2019 amounts to 4,803.3 million euros

million euros and transfers to the institutions, individuals, NGOs and the public sector by 10.6 million euro.

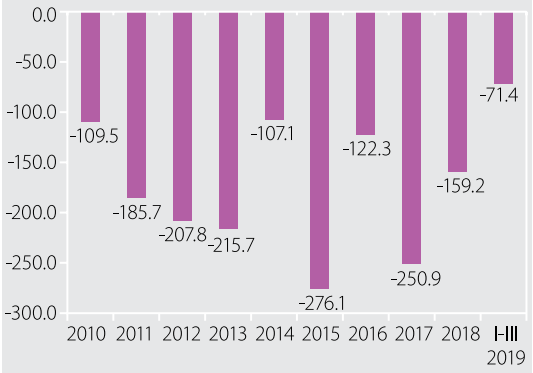
Current budget expenditures in the observed period amounted to 195.5 million euro and were lower than planned for 15.1% as a result of the fall in capital expenditures by 9 million, while the most significant decrease in expenditures in relation to the comparative period of the previous year was recorded in interests (20.2%).

Montenegro's capital budget amounted to 45.3 million euros or 0.9% of GDP.

The deficit of the Budget of Montenegro was estimated to 71.4 million euros, or 1.5% of GDP for Q1 2019.

Graph 32

Budget surplus/deficit in the period 2010 – March 2019, in million euros



Source: Ministry of Finance

3.1.3. Non-financial sector[8]

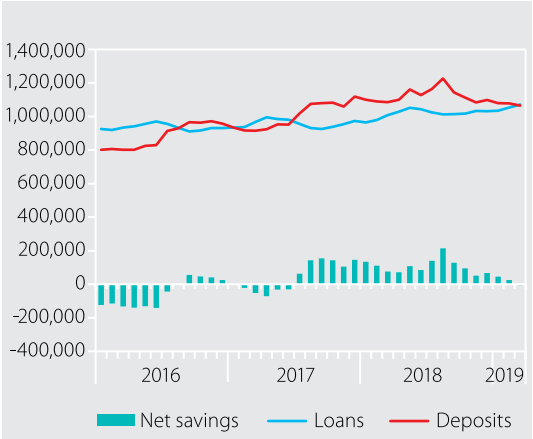
Due to the lack of data on the non-financial sector investments, we can use the sector's net indebtedness as an approximation.

At end-March 2019, loans to non-financial sector were higher than this sector's deposits. At end-Q1 2019, net savings of the non-financial sector amounted to 5.5 million euros. (Graph 33)

Long-term loans accounted for the main share of 75.7% in the structure of corporate sector loans, which indicates that loans to this sector were mainly used for increasing economic activity volume.

Graph 33

Net savings/indebtedness of the non-financial sector, in thousand euro



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

3.1.4. External demand and the current account

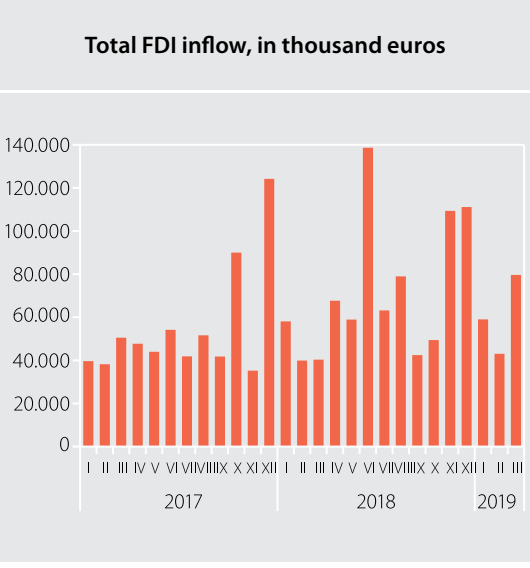
In the first quarter of 2019, there was a deficit in the current account as a result of an increase in the deficit in the commodity account and a decrease in the surplus in the primary income account. According to preliminary data, the current account deficit stood at 317.6[9] million euros widening by 4.6% in relation to the same period of 2018 induced by the deepening goods account imbalance, i.e. absolute growth of visible imports considerably exceeding that of exports.

In the period January-March 2019, the goods account ran a deficit of 409.2 million euros or by 5.1% more than in 2018. Total visible exports stood at 101.1 million euros, increasing by 1.7%, while the value of goods imported at the same time 510.3 million euros, which represents a 4.4% increase y-o-y.

On the other hand, an increase in the surplus on the services account by 43% (to 25.8 million euro) was recorded as a result of the significantly stronger growth of exports from imports of services (20% against 16.7%). The increase of tourism revenues by 7.9% contributed to this. Primary income account ran a surplus of 9.4 million euros, or 20.9% less y-o-y. In the observed period, total expenditures increased by 16.6%, and are the result of an increase in expenditures based on employee compensation. Secondary income account ran a surplus of 56.4 million euros, or 1% more y-o-y.

Preliminary data suggests that net foreign direct investments (FDIs) inflow for the period January-March 2019 amounted to 82.7 million euros, which is a year-on-year growth of 62.9%. Total FDI inflow stood at 181.8 million euros, with equity investments amounting to 123.5 million euros and the inflow in the form of intercompany amounted to 50.8 million euros or 36.1% less y-o-y. In the structure of equity investments, investments in companies and banks amounted to 85 million euros, while real estate investments amounted to 38.5 million euros and were 18.8% higher than in the same period in 2018. In the total FDI inflow structure, income from investments into companies and banks amounted to 46.7%, followed by investments in intercompany debt 28%, while investments into immovable properties amounted to 21.2%. The total FDI outflow amounted to 99 million euros, which is 13.1% more than in the same period in 2018.

Graph 34



Source: CBCG

In the period January-March 2019, *portfolio investments* account recorded net inflow of 5.7 million euros, while the net inflow in the *other investments* account amounted to 130.3 million euros. The developments in this account are charac-

[9] Montenegro's balance of payments' data published in accordance with the new IMF methodology (IMF Balance of Payment Manual, sixth edition - BMP 6)

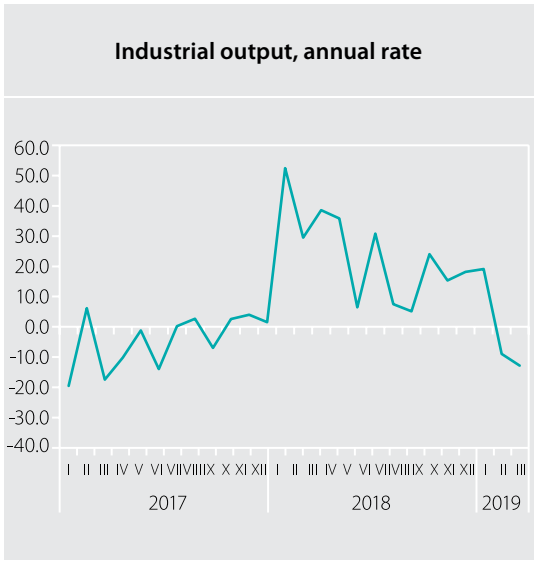
terized by the increase in liabilities of all sectors based on borrowings, with simultaneous increase in deposits of local banks abroad.

3.2. Supply and demand

In Q1 2019, industrial output recorded a year-on-year decline of 14.4% due to the decline recorded in the manufacturing industry and electricity, gas and steam supply sectors of 0.5% and 27.5%, respectively. Output increase of 9.5% was recorded in the mining and quarrying sector. Observation of monthly data on the industrial output trends in Q1 2019 shows that fall was recorded in January (-27%), while industrial output increased in February (8.9%) and March (2.1%).

In Q1 2019, a total of 121.946 tourists stayed in collective accommodation establishments, which is a year-on-year increase of 44.1%. The number of domestic tourists' arrivals in collective accommodation establishments increased by 3%, while the number of foreign tourists grew by 55.7%. Tourist overnights amounted to 234,459, which is a year-on-year increase of 22.5%.

Graph 35



Source: MONSTAT

In Q1 2019, forestry recorded[10] a total of 7,554m³ of forest assortments, which is a significant year-on-year decrease of 44.6%.

The value of executed construction works amounted to 163.5 million euros in Q1 2019, recording a 12.4% y-o-y growth, and construction activity measured by effective working hours grew by 1.5%.

In the first three months of 2019, air passenger transport recorded a year-on-year increase of 6.4%, while air freight transport increased by 9.2%. In Q1 2019, road passenger transport recorded year-on-year increase of 0.5%[11], while road freight transport increased by 4.5%[12]. Passenger railway transport rose by 1.1%[13], while freight railway transport dropped by 24.7%[14].

[10] Presented through weighted index, while presented through non-weighted index production declined by 43,9% over the same period.

[11] Presented as the number of passengers, while presented in passenger-kilometres, it increased by 1.5%

[12] Presented through transported goods in thousand tonnes, while it increased by 13.3% presented in ton-kilometres

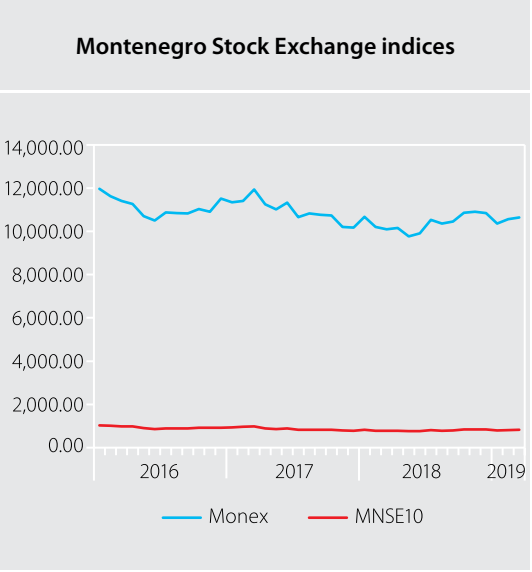
[13] Presented through number of passengers in thousands, while it increased by 1.8% presented through passenger kilometres

[14] Presented in thousand tonnes, while presented in ton-kilometres, it decreased by 25%

3.3. Stock exchange indices

At end-Q1 2019, the Monex and MNSE10 indices recorded decline in relation to end-2018. Year-on-year comparison reveals growth in both indices (Graph 36).

Graph 36



Source: Montenegro Stock Exchange

At end-March 2019, SE index Monex[15] amounted to 10,638.74 recording decline of 201.75 index points or 1.9% in relation to end-2018, and a year-on-year increase of 550.75 index points or 5.5%.

MNSE10 index[16] stood at 832.28 at end-Q1, and recorded a decline of 4.8 index points or 0.6% compared to end-2018, while it was higher by 49.6 index points or 6.3% y-o-y.

[15] 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

[16] 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

During Q1 2019, there were no changes to the existing ones, nor were new decisions made regarding the Central Bank of Montenegro monetary policy instruments.

5. INFLATION FORECAST FOR THREE QUARTERS OF 2019 AND Q1 2020

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, and the like).

Montenegro's fan chart for three quarters of 2019 and Q1 2020 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 three quarters of 2019 and Q1 2020

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[17].

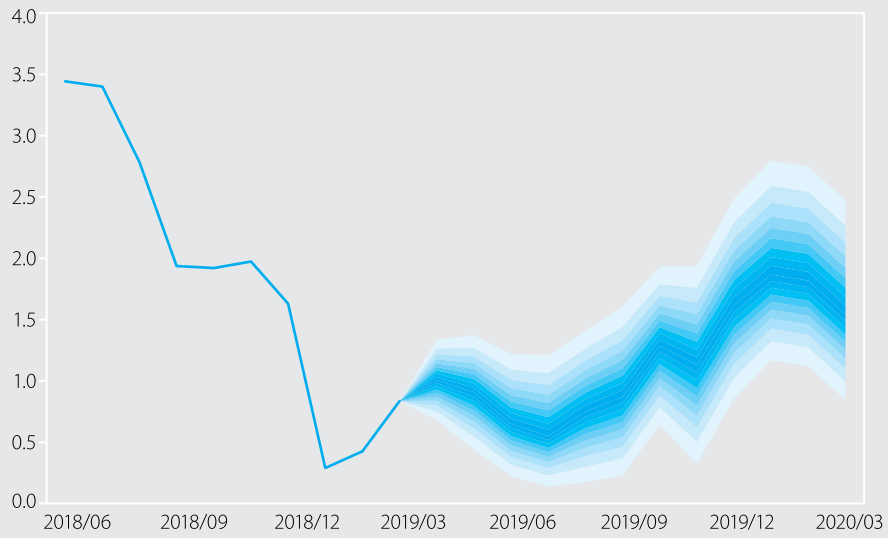
[17] A detailed explanation of the ARIMA model of Montenegro was presented in the working study of the Central Bank No. 11 " Inflation Forecast". Empirical research on the retail price index trend of Montenegro for 2007 - applying the ARIMA model

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 (2,1,2)[18] has sufficient confidence level for forecasts.

The monthly forecasts value was used as the value of central projection of the CPI graph for three quarters of 2019 and Q1 2020. 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 three quarters of 2019 and Q1 2020



Source: CBCG, 2019

Mean value of the obtained model is 1.2. 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.[19] 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.

[18] 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.

[19] 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 three quarters of 2019 and Q1 2020 indicates that there is a *90% probability that the CPI inflation will range between 0.2% and 2.8%, depending on the month, with the central projection of 1.2%. At the same time, inflation at the end of 2019 is forecasted to range between 0.9% and 2.5%, with the central projection of 1.6%*. The fan chart central projection (the darkest part) represents a 10% probability span (Graph 36).

The starting assumptions for forecasting inflation for the first three quarters of 2019 and Q1 of 2020

The projection is based on projected energy and food prices, inflation projections in the euro area, and the announced excise duties calendar (for alcoholic beverages and coal). The risks related to the projected inflation rate shown on the fan chart are 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:

- Excise duties on cigarettes, coal, alcohol and carbonated water will remain the same until the end of 2019,
- Potential increase in electricity prices of 5% in 2019,
- Fluctuation of +/-5% in the agricultural product prices, caused by weather conditions,
- Wages and salaries stagnation.

External factors:

- By 2019, we assumed that crude oil prices in the international market would not increase significantly (up to 5%), while in 2020 the average crude oil price is projected to decline.
- For 2019, a moderate increase in food prices is forecasted, as well as the price of metals at the international market.
- The ECB stated that growth risks were still down because of uncertainty over geopolitical factors. The expansion of economic activity in the euro area of 1.2% in 2019 will not exert inflationary pressures, thus the ECB stands by its expectations of the inflation rate being just below the target (1.3%)[20]. Also, the ECB announced that key interest rates will remain unchanged until the end of 2019. 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.

[20] Source: *Eurosystem staff macroeconomic projections for the euro area*, June 2019

6. EXPECTED INFLATION IN 2019

In the first quarter of this year, estimated economic growth was 3%. A survey among entrepreneurs, forecasts by the CBCG and relevant international organizations indicate the growth of economic activity in 2019, which will act anti-inflationary.

The largest number of surveyed banks and corporate sector expects an inflation rate of between 1.5% and 2%. According to preliminary data, in Q1 2019, the aggregate demand recorded a year-on-year increase, yet a decline in relation to Q4 2018.

We do not expect inflationary pressures from the international environment, except in the case of „strengthening" of geopolitical tensions, which could affect primarily the oil prices' trends.

For all these reasons, we expect a moderate inflation rate this year. The Fan Chart of inflation indicates that there is a 90% probability that the CPI inflation will range between 0.2% and 2.8%, depending on the month with the central projection of 1.2%. At the same time, inflation at the end of 2019 is forecasted to range between 0.9% and 2.5%, with the central projection of 1.6%. Our expert assessment is similar to a model estimate and we expect that in 2019 inflation will range from 1% to 2.5%.

Table 3

Estimated inflation rate		
Optimistic assessment	Realistic assessment	Pessimistic assessment
1%	1.75%	2.5%

The assumptions on which this estimation is based are the same as the assumptions on which the model estimation is based. Deviation of any of the mentioned parameters from the expected values would also require revision of the estimation.