CENTRAL BANK OF MONTENEGRO

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1. INFLATION INDICATORS

After mild inflation in 2016, prices in Montenegro in Q1 2016 declined compared to December 2015 and amounted to -1.3%. The decline in prices resulted mostly from global decrease in price of oil, affecting the price decline in categories *transport* (-2.9%), and decline in prices of many food products under category *food and non-alcoholic beverages* (-2.0%). Observing monthly trend in consumer price index, the price decrease was recorded in all three months, with respective -0.9%, -0.4% and -0.1% in January, February and March. Average consumer prices rate in the first three months of 2016 amounted to 0% y-o-y, while at the annual level, prices recorded decrease of 0.9%.

Table 1

Inflation, %					
	2015				2016
	III	VI	IX	XII	III
Change relative to the previous year-end	1.2	2.2	2.1	1.4	-1.3
Annual change	1.6	1.9	1.7	1.4	-0.9

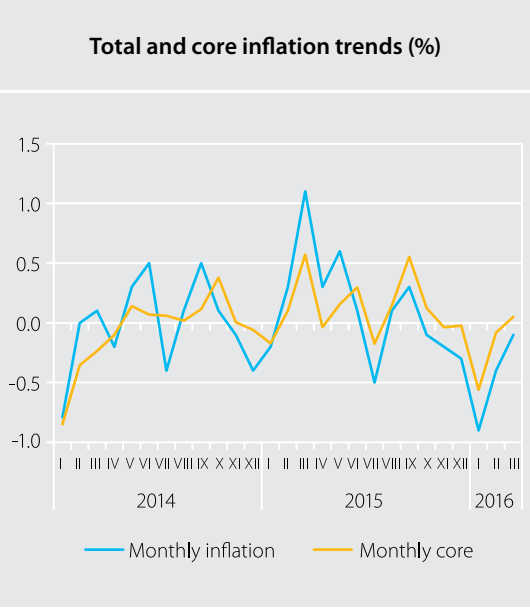
Source: Monstat

Prices under *transport* recorded the highest annual decline in Q1 2016 of -2.9%, resulting from the decrease in prices of fuels and lubricants (-6.3%). In addition, prices under *food and non-alcoholic beverages* decreased by 2%, and this category recorded the highest negative contribution to total inflation (-0.7 percentage points). Under this category, prices of vegetables, fruit, meat, food products, cheese, milk and eggs, and fish and seafood decreased respectively by -9.2%, -6.7%, -1.8%, -1.6%, -1.3% and -0.7%, while prices of non-alcoholic beverages increased by 0.7%. During the reporting period, decline was recorded in prices under *clothing and footwear*, due to decline in price of clothing and of footwear with respective -3.5% and -1.2%, as well as in categories *restaurants and hotels* (-0.7%), *miscellaneous goods and services* (-0.4%) and *housing, water, electricity gas and other fuels* (-0.3%). Price increase was recorded in *health* (0.7%), as well as in *alcoholic beverages and tobacco* and *furnishing, household equipment and routine household maintenance* by 0.1% each. In March 2016, prices under *Communication, recreation and culture* and *education* remained unchanged relative to December 2015.

Monthly **core** inflation[1] was higher than the official monthly inflation during all three months. Official monthly inflation recorded negative rate during all three months, while core inflation recorded negative rate in January and February, yet being positive in March.

[1] As of January 2016, Monstat expanded the consumer list with new products, some of which were calculated into the calculation of core inflation, based on methodology

Graph 1



Source: Monstat

Table 2

Share of selected categories in total inflation[2]

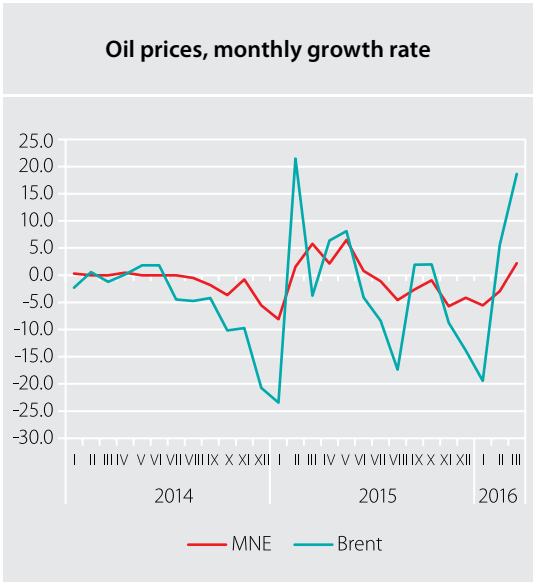
	Weights	III 16/XII 15	Growth rate	Contribution
TOTAL	1000.0	98.7	-1.3	-1.3
Food and non-alcoholic beverages	351.7	98.0	-2.0	-0.7
Alcoholic beverages and tobacco	38.6	100.1	0.1	0.0
Clothing and footwear	85.1	97.5	-2.5	-0.2
Housing, water, electricity gas and other fuels	155.3	99.7	-0.3	-0.1
Furnishing, household equipment and routine household maintenance	41.2	100.1	0.1	0.0
Health	40.9	100.7	0.7	0.0
Transport	107.0	97.1	-2.9	-0.3
Communication	49.9	100.0	0.0	0.0
Recreation and culture	33.2	100.0	0.0	0.0
Education	19.3	100.0	0.0	0.0
Restaurants and hotels	31.3	99.3	-0.7	0.0
Miscellaneous goods and services	46.5	99.6	-0.4	0.0

Source: Monstat and CBCG calculations

[2] 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.

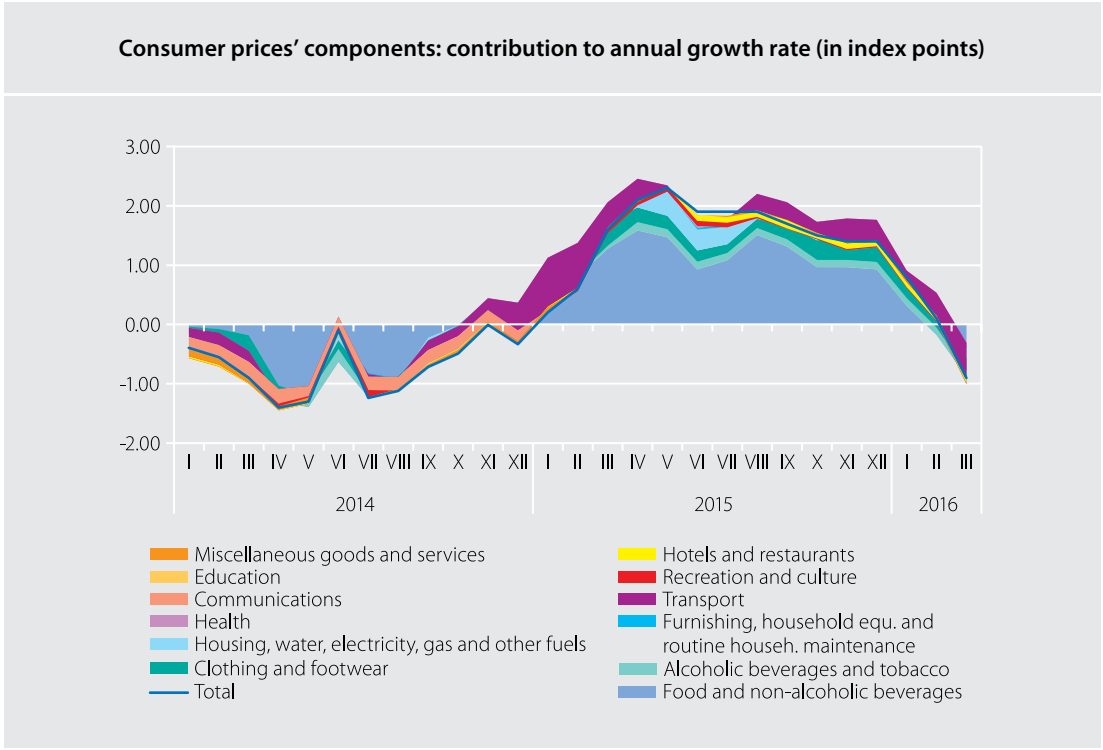
In Q1 2016, the oil prices at global markets declined in relation to Q4 2015. The average price of the OPEC reference basket in Q1 2016 amounted to 30 USD/barrel, which is a 24.6% lower relative to December 2015. The average price of Brent in Q1 2016 was 33.9 USD/barrel, or 22.4% lower relative to Q4 2015. The price decline of oil at the global market in Q1 2016 mostly resulted from production of oil by countries that are not OPEC members, increased offer of oil from Iran and low seasonal demand for this fuel. The World Bank forecasts expect that prices of oil will average to 41 USD/barrel in 2016.[3]

Graph 2



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

Graph 3



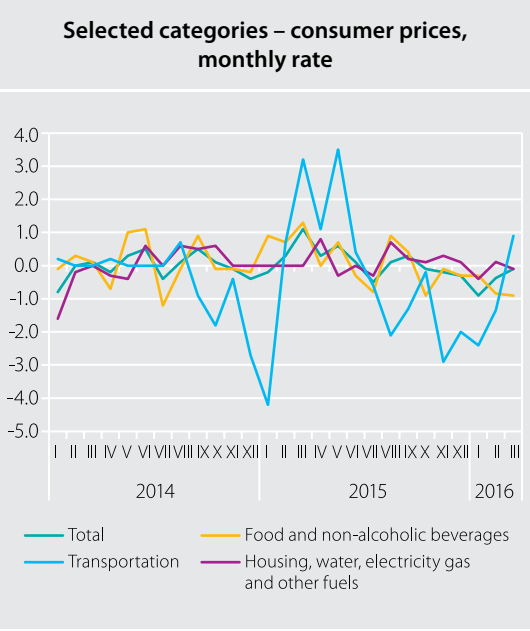
Source: Monstat and CBCG calculations

[3] Source: World Bank: "Commodity Markets Outlook", April 2016

Graph 4

Source: Monstat

Graph 5



Source: Monstat

The largest contribution to inflation decline (-0.9%) was recorded by the prices of *food and non-alcoholic beverages* of 2.5%. Annual price decline was recorded also in categories *transport* (-6.5%), and *miscellaneous goods and services* (-0,8%). Annual price growth was recorded in prices under *restaurants and hotels* (2.9%), *alcoholic beverages and tobacco* (2.7%), *clothing and footwear* (2.4%), *health* (1.4%), *housing, water, electricity, gas and other fuels* (1.1%), *furnishing, household equipment and routine household maintenance* (0.8%), *communication* (0.2%), and *recreation and culture* (0.1%) Prices under *education* remained unchanged at the annual level.

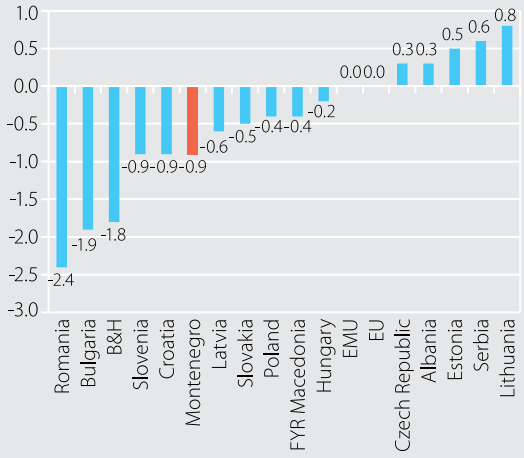
The producers' prices of manufactured products recorded a quarterly decline of 0.3% in Q1 2016. Price decline of 1% was recorded in electricity, gas and steam supply sector, while prices under manufacturing industry recorded growth of 0.1%. Prices under mining and quarrying remained unchanged. On the annual level, producers' prices of manufactured products remained unchanged.

Comparison of annual inflation recorded in Montenegro with inflation recorded in selected countries shows that, in addition to Montenegro, most of selected countries recorded negative inflation. Positive inflation rate was recorded only in Lithuania (0.8%), Serbia (0.6%), Estonia (0.5%), and Albania and Czech Republic (0.3% each). The highest negative inflation rate was recorded in Romania and Bulgaria with the respective -2.4% and -1.9%, while as regards neighbouring countries, Bosnia and Herzegovina, Croatia and Macedonia recorded respective negative rates of -1.8%, -0.9% and -0.4%.

The annual HICP inflation rate reported in the Euro area amounted to 0%, CPI inflation in Montenegro amounted to -0.9%, while annual HICP inflation in Montenegro was -0.5%.

Graph 6

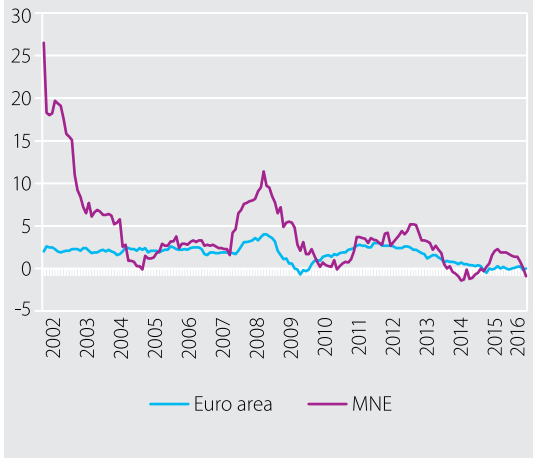
Annual inflation rate in selected countries, March 2016



Source: National Statistical offices and Eurostat

Graph 7

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



Source: Monstat and Eurostat

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

2. INFLATION EXPECTATIONS

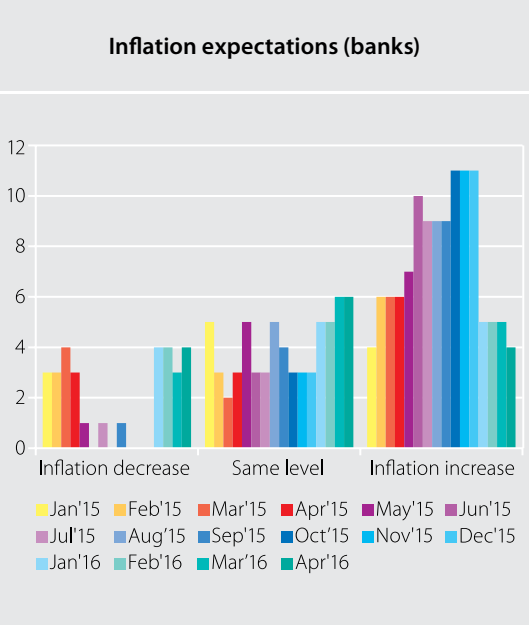
2.1. Banks' Expectations

With regard to inflation expectations of banks, based on the survey conducted in April 2016, four banks expect inflation to decline or grow as in 2014, while six banks expect inflation the same as in 2015 (Graph 8).

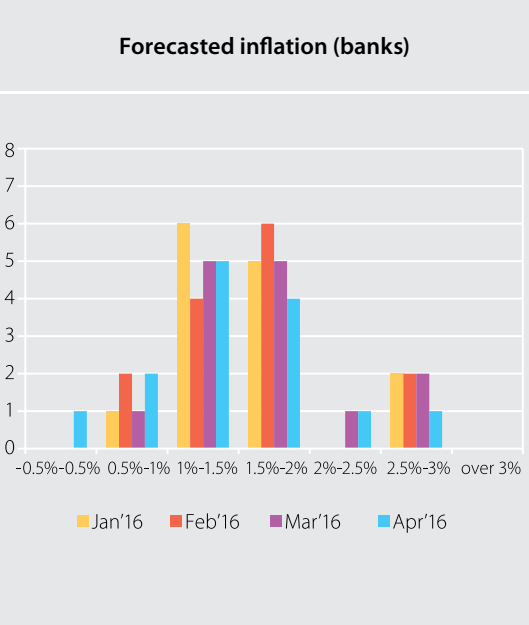
Banks have different expectations regarding inflation levels. Five banks expect the level of inflation in the range of 1% and 1.5%, four banks expected inflation to range between 1.5% and 2%, while two banks expected inflation between 0.5% and 1%. The levels between -0.5% and 0.5%, between 2% and 2.5%, and between 2.5% and 3% are expected by one ban each, while none of surveyed banks expected inflation above 3% (Graph 9).

As for expectations regarding the nominal lending interest rates, thirteen banks expect this rate to decline, one bank expects it to remain unchanged, while no banks expect the increase of this rate. Banks' expectations regarding the effective lending interest rates are the same.

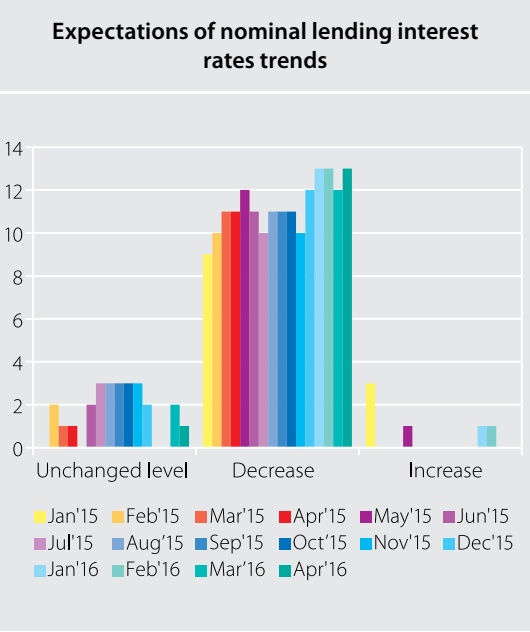
Graph 8



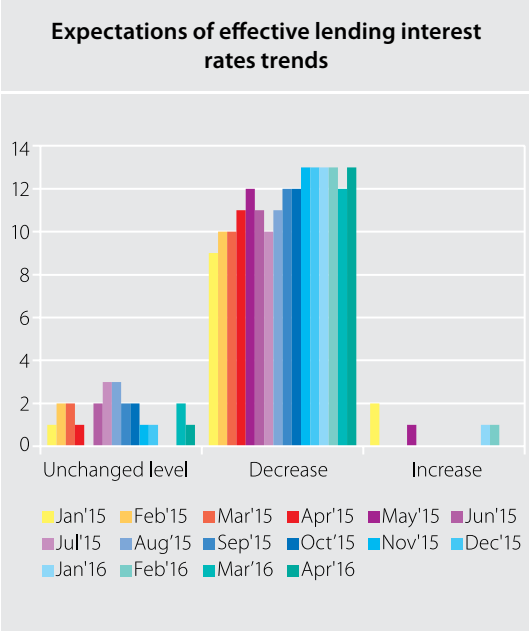
Graph 9



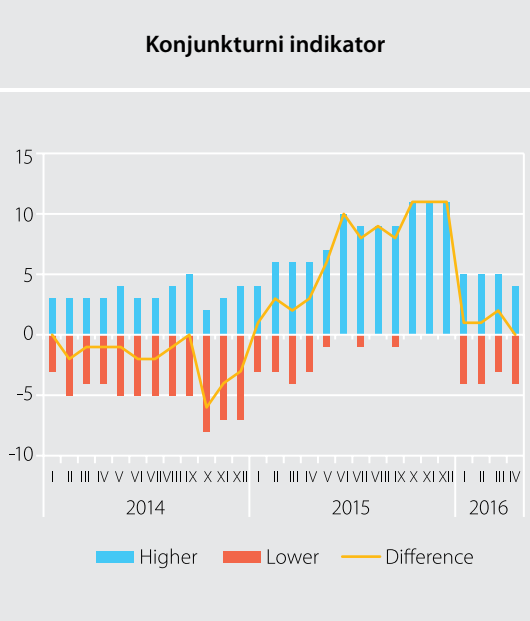
Graph 10



Graph 11



Graph 12



With regard to deposit interest rates trends, eleven banks expected them to decline, two banks expects them to remain unchanged, while one bank expected the increase in deposit interest rate.

For the purpose of calculating inflation forecasts we use market trend indicator (line in Graph 12). It is calculated as the difference between the number of banks expecting an 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 it has a positive value, 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 forecast is, and vice versa, higher positive value means higher inflation level forecasts. In 2015, the level of inflation expectations significantly decreased in January 2016, since then being on significantly lower level compared to the previous periods, particularly compared to Q4 2015 when all banks expected inflation growth.

2.2. Expectations of Economy (Except Banks)

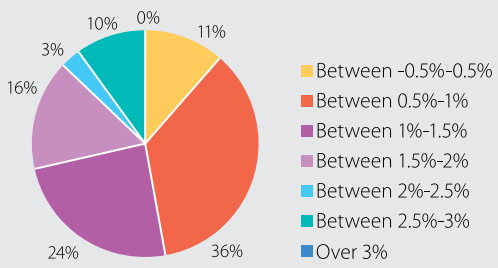
Inflation

Out of total surveyed companies, the largest number (36%) expected that inflation in 2016 would range between 0.5% and 1%. Inflation in the range of 1% to 1.5% is expected by 24% of companies, while 16% of surveyed companies expect the inflation to range between 1.5% and 2% (Graph 13). Some 81% surveyed companies expected wages and salaries to remain unchanged in 2015, 6% of the surveyed companies expected lower level, while 18% expected increase in wages and salaries. With regard to the number of employed persons, 67% of surveyed companies expect it to remain unchanged, 20% expect this number to increase, and 13% expected it to decrease.

The majority of surveyed companies (64%) expected the prices of production inputs to remain unchanged, and 81% expect the prices of their products (services) not to change in 2016.

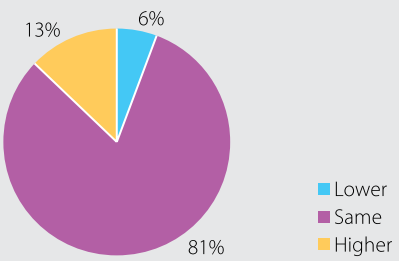
Graph 13

Expected inflation in 2016 in relation to 2015



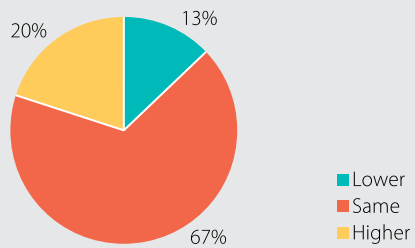
Graph 14

Expected wages and salaries in 2016 in relation to 2015



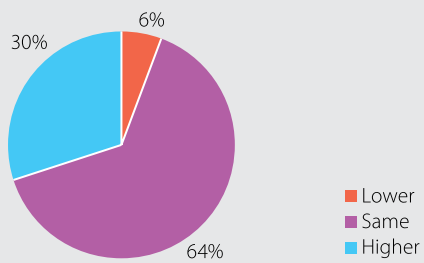
Graph 15

Expected number of employees in 2016 in relation to 2015

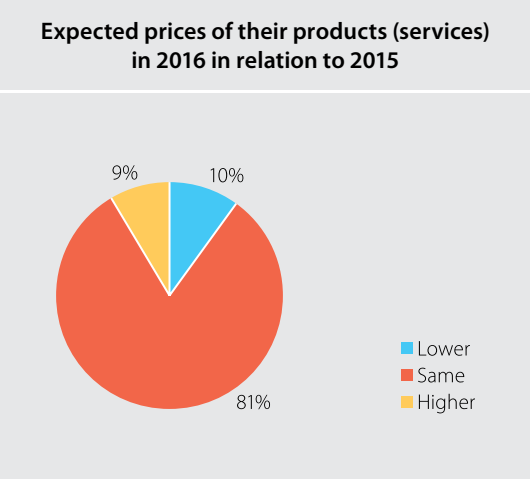


Graph 16

Expected prices of production inputs in 2016 in relation to 2015



Graph 17

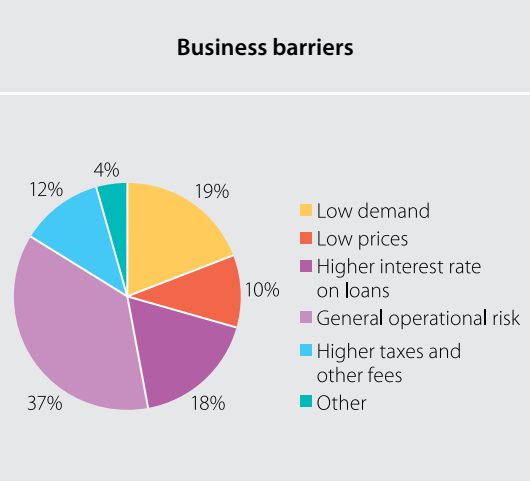


Business Environment

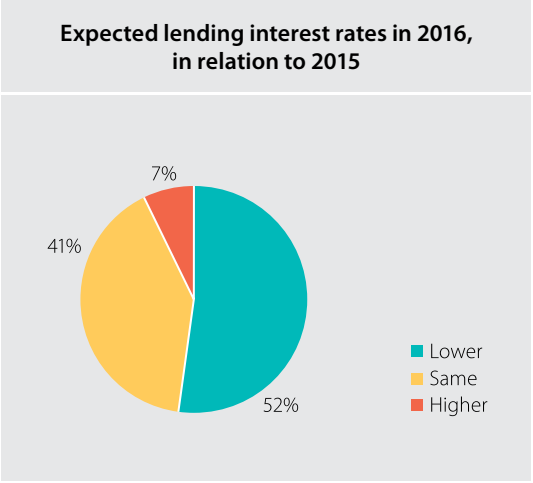
In the area of business barriers, survey results showed that most of the surveyed companies saw general operational risks (37%) low demand (19%), and high lending interest rates (18%) as main obstacles.

With regard to lending interest rates, 52% of surveyed companies expected them to decline, 41% expected them to remain unchanged, while 7% expected higher lending interest rates in 2016 relative to 2015.

Graph 18



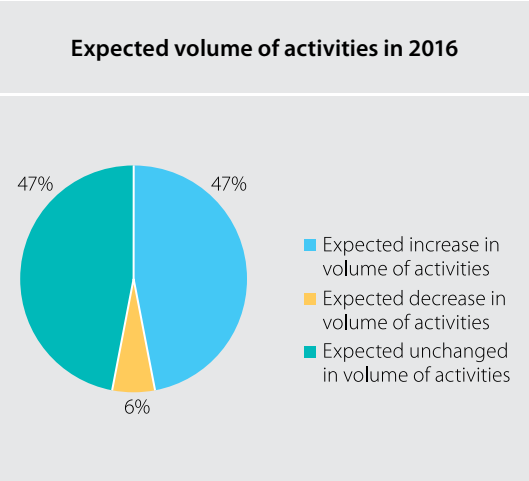
Graph 19



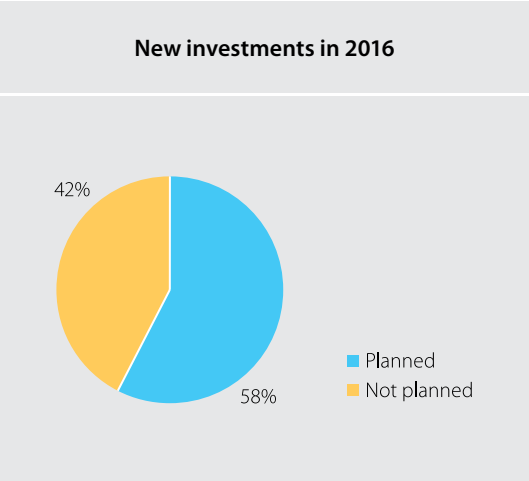
Investments

Out of the total number of surveyed companies, 47% planned the increase in the volume of activities in 2016, while 58% planned new investments. Most investments (60%) referred to the increase in fixed assets, while insufficient exploitation of existing capacities (31%), low demand and other obstacles (24% each), high interest rates and unfavourable conditions for capital borrowings (12%), and high production costs (9%) were described as main barriers to new investments.

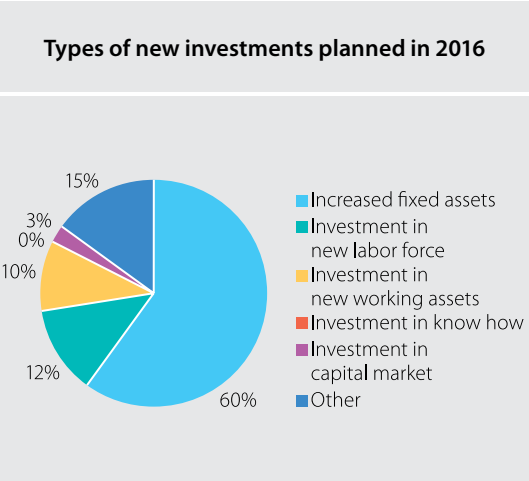
Graph 20



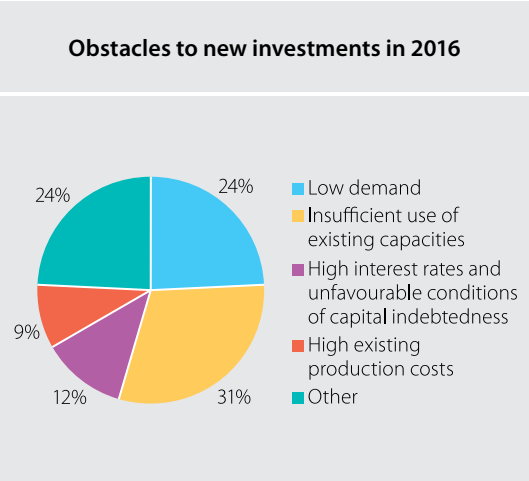
Graph 21



Graph 22



Graph 23



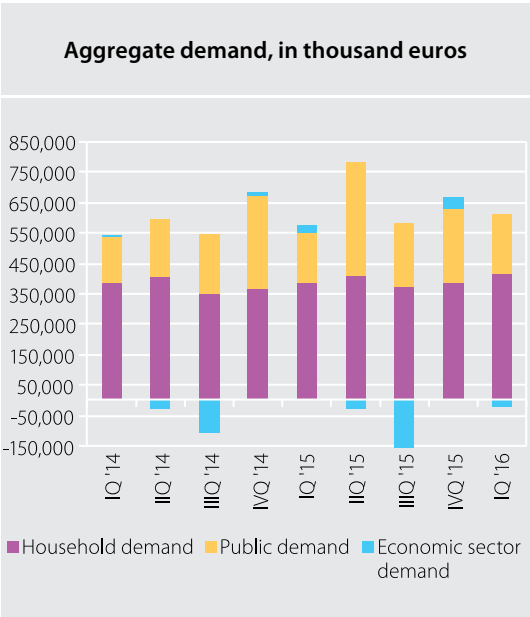
3. INFLATION DETERMINANTS

3.1. Demand

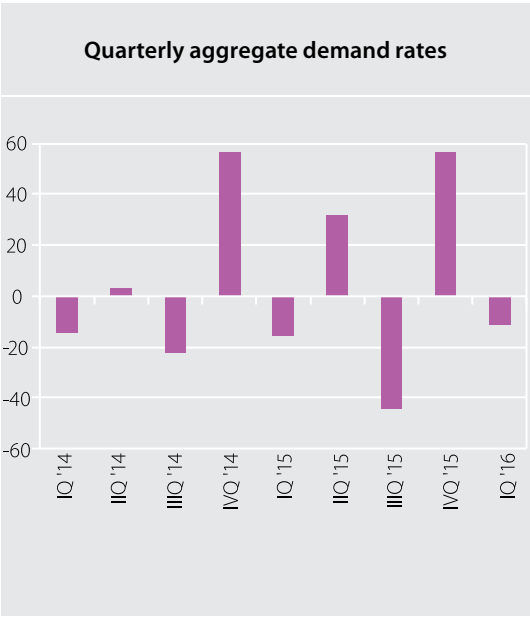
As per preliminary data for Q1 2016, the aggregate demand recorded a y-o-y increase, yet a decline in relation to Q4 2014. The total demand structure in relation to Q4 2015 shows the increased share of household, while the share of public spending and corporate sectors decreased.

In Q1 2016, the level of aggregate demand recorded a slight growth compared y-o-y, while it declined in relation to Q4 2014.

Graph 24



Graph 25



Box 1 - Aggregate demand calculation methodology

For the purpose of complete monitoring of aggregate demand as the inflation determinant, the CBCG has developed the aggregate demand calculation methodology. The starting point of this methodology stems that the aggregate demand is the total 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 selling shares, non-market income, non-observed economy revenues, and the like. Methodology of calculation of the aggregate demand is expressed by the following equation:

$$AD = C + I + G$$

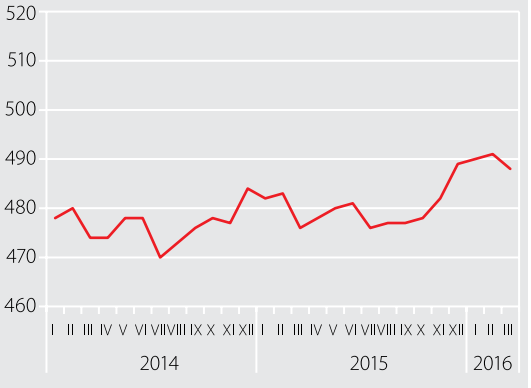
C = sum of paid salaries + sum of paid pensions + paid frozen foreign currency deposits + net compensations to households – net household savings (savings – loans granted)
I = net savings of economy (deposits – loans)
G = public consumption – paid pensions – salaries paid from the budget – net savings by the Government (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 2016, an average gross salary in Montenegro amounted to 737 euros, while an average salary without taxes and contributions amounted to 490 euros. Average gross and net wages and salaries recorded respective quarterly increases of 1.2% and 1.4%. Average gross and net wages and salaries recorded respective y-o-y increases of 1.4% and 2.1%.

Graph 26

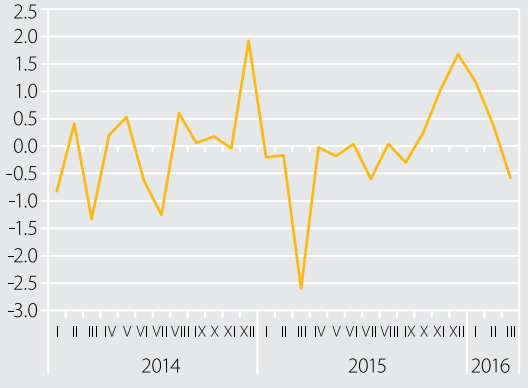
Average wages and salaries without taxes and contributions in Montenegro



Source: Monstat

Graph 27

Real wages and salaries (monthly growth rate)



Source: Monstat

Taking into account the consumer prices, i.e. trends in wages and salaries in real amounts, it can be concluded that real wages and salaries grew in January and February, while they declined in March.

Households' loans were marked by a positive trend in Q1 2016. The average monthly growth of loans granted to this sector was 0.5%, while the growth at the average rate of 0.4% was recorded in the same period of 2015. At the end of March 2016, household loans amounted to 935.3 million, which was 14 million euros or 1.5% more than at the end of the previous year, i.e. 30.8 million euros or 3.4% more than in same period of the previous year.

At end-March 2016, debt per capita[5] amounted to 1,503 euros, recording increase by 22 euros in relation to end-2015, and by 49 euros compared y-o-y.

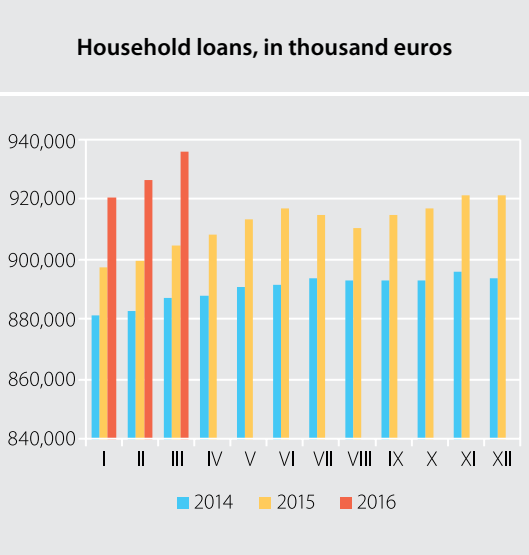
Total MFIs loans disbursed to households amounted to 48 million euros at end-March 2016 which was 2.2 million euros or 4.8% more than at the end of 2015, and 9.3 million euros or 24.1% higher compared y-o-y.

During Q1 2016, deposits of the household sector recorded average monthly uptrend of 0.02% (the average monthly growth of 0.5% was recorded in the same period of 2015). At end-Q1 2016, deposits to the household sector amounted to 1,440.8 million euros, which is by 955,000 euros or 0.1% more than at the end-2015, or by 88 million euros (6.5%) more than in the same period of the previous year.

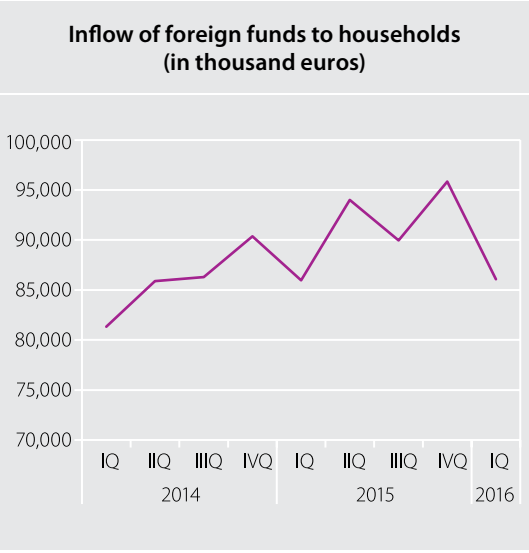
At end-March 2016, loans to deposits ratio for this sector amounted to 0.65 being higher compared to end-2015 (0.64), yet recording a y-o-y decline (0.67).

Household sector reported total net savings of 505.4 million euros in end Q1 2016, which represented a quarterly decrease of 13 million euros or 2.5%, yet a y-o-y increase of 57.2 million euros or 12.8%.

Graph 28



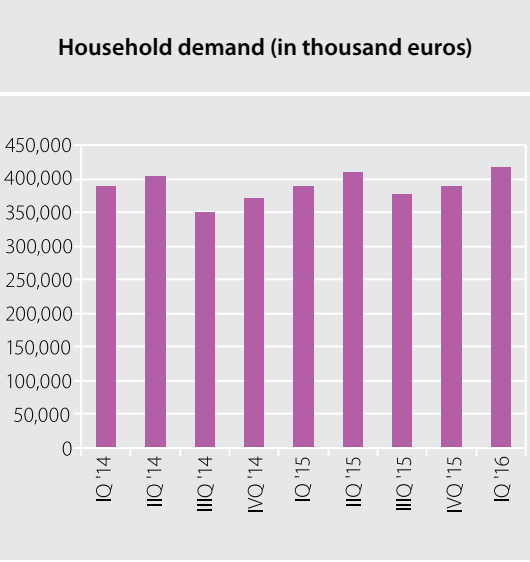
Graph 29



Source: CBCG

[5] Population estimate for 2016 and 2015: Estimate as at 1 January (2016 and 2015), Source: Monstat

Graph 30



In Q1 2016, y-o-y increase was recorded in the inflow arising from salaries and wages to employees, heritage and other gifts and assistance, and from personal transfers.

Observation of the total household demand by quarters shows that household demand in Q1 2016 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 604.6 million euros in Q1 2016.

Source revenues amounted to 284.8 million euros or 7.6% of estimated GDP[7], and they decreased by 4.6% in relation to the plan, and they showed a y-o-y increase of 10.2%. In the structure of source revenues, tax revenues accounted for the main share of 63.4%, followed by contributions with 31.7%, other revenues with 2.1%, fees with 1.5%, duties with 0.8%, donations with 0.4%, and revenues from loan repayments with 0.1%.

Tax based revenues amounted to 180.4 million euros, recording a 9.4% increase relative to the plan and a 12.3% increase compared y-o-y. Nominally, the highest y-o-y increase of revenues was realised in value added tax, amounting to 7.8 million euros or 8.3%, and with corporate profit tax amounting to 5.5 million euros or 49.1%.

Negative deviance from the same period of 2015 is recorded in international trade tax.

Revenues arising from contributions amounted to 90.1 million euros being 5% over the plan for Q1 2016, and recording a 7.5% y-o-y increase.

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

[7] Source: Ministry of Finance, Estimated GDP for 2016 amounts to 3.762.2 million euros

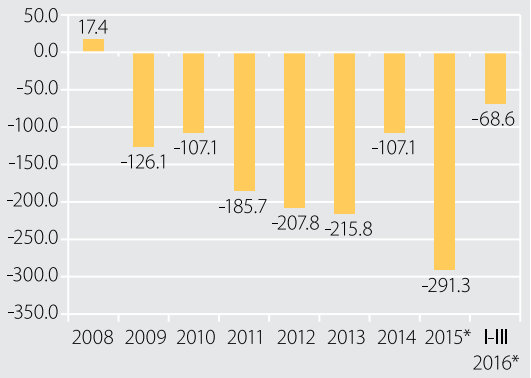
Total Budget expenditures in Q1 2016 amounted to 353.3 million or 9.4% of GDP. Recorded expenditures were lower than planned for Q1 2016 by 20.2%, but higher compared to Q1 2015 by 11.5% or 36.4 million euros, mainly as a result of repayment of interest, obligations from previous years, social welfare transfers, and transfers to institutions, individuals, non-government and public sectors.

Current budget expenditures amounted to 164.7 million euros or 6.2% more than planned. Almost all current expenditures, except expenditures for interest, other personal income and rents, were below planned. Montenegro's capital budget amounted to 2.4 million euros or 0.1% of GDP.

The Deficit of the Budget of Montenegro was estimated to 38.6 million euros, or 1.8% of GDP.

Graph 31

Budget surplus/deficit in the period 2008 – March 2016, in million euros



Source: Ministry of Finance (data for 2015 are preliminary)

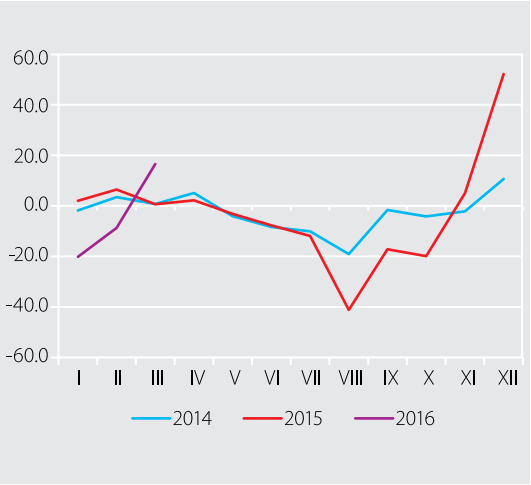
3.1.3. Economy

Due to the absence of data on investments by the corporate sector, net corporate sector indebtedness can be used for approximation.

In Q1 2016, loans to the corporate sector significantly exceeded this sector's deposits. Thus, the net debt of the corporate sector amounted to 128.7 million euros at the end of the reporting period, and it was 22.9 million euros or 15.1% higher than at end-2015, yet 174.1 million euros or 57.5% lower compared y-o-y. Long-term loans accounted for the main share of 74.9% in the structure of loans to the corporate sector, which indicates that loans to this sector were mainly used for the increase in the volume of economic activity.

Graph 32

Net debt of economy, monthly change, in %



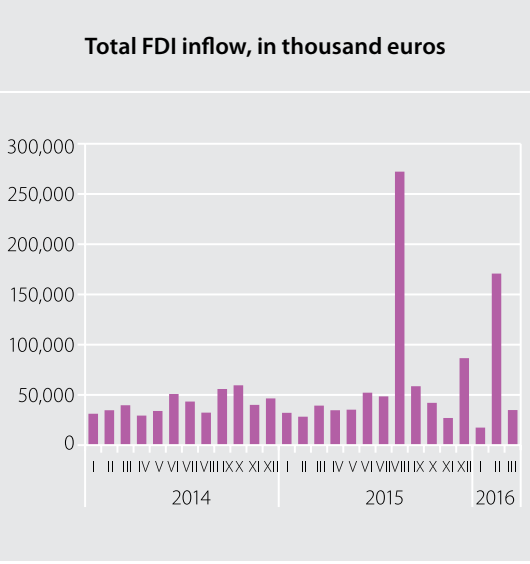
3.1.4. External Demand and the Current Account

In Q1 2016, compared y-o-y, current account deficit increased, services account ran deficit, while net FDI inflow decreased. According to preliminary data, current account deficit amounted to 283.9 million euros[8], showing a y-o-y increase of 45.6%. Simultaneously, the deficit at the goods account amounted to 306.1 million euros[9] or 13.2% more compared y-o-y, as the result of decreased export of goods by 24.9% and increase in imports by 4.8%. The export of aluminium and electricity mostly contributed to export decline.

During the reporting period, services account ran a deficit amounting to 9.9 million euros, while primary (factor) income account recorded surplus amounting to 7.1 million euros, showing a y-o-y decline of 83%. Secondary income account recorded surplus amounting to 25 million euros, or 17.6% more than in 2015.

Net FDI inflow in Q1 2016 amounted to 11.6 million, or 86.3% less than in the same period of the previous year. Total FDI inflow amounted to 232.2 million euros, while the outflow amounted to 211.6 million euros, dominantly resulting from accumulated dividends of one company.

Graph 33



Source: CBCG

FDI inflow in the form of equity investments amounted to 98.2 million euros or 44% of total inflow in Q1 2016. In the structure of equity investments, investments in companies accounted for 74.3 million euros, while inflow arising from the investments in real estates amounted to 23.9 million euros. Inflow of FDI in the form of intercompany debt amounted to 28.1 million euros or 12.6% of the total inflow, while inflow from the withdrawal of residents' funds invested abroad amounted to 96.9 million euros. Total FDI outflow amounted to 211.6 million euros, of which 193.5 million euros referred to pay-out of dividends. In the outflow structure, outflow from residents' investments abroad amounted to 3 million euros, while withdrawal of non-residents' funds invested in Montenegro amounted to 208.6 million euros.

Portfolio investments account recorded net inflow of 213.1 million euros in Q1 2016, resulting from borrowing by the state through the issuing of Eurobonds at the international capital market.

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

[9] The CBCG performs adjustments of data received by Monstat for the purposes of compiling the balance of payments in line with the IMF methodology (Balance of Payments Manual, Fifth edition, IMF, 1993). Data on visible import and export are presented by f.o.b.

Other investments account recorded net inflow amounting to 22.5 million euros. Trends at this account are characterised by decreased banks' liabilities from loans taken, while liabilities of other sectors (economy) increased.

3.2. Supply and Production

In Q1 2016, industrial output recorded a 9.2% y-o-y decline due to the decline recorded in mining and quarrying and electricity, gas and steam supply sectors of 43.9% and 18.9%, respectively. Manufacturing industry recorded y-o-y output growth of 5.2%. Observation of monthly data on the industrial output trends in Q1 2016 shows that growth was recorded in February (1.7%) and March (33.8%), while industrial output declined in January (-14.2%).

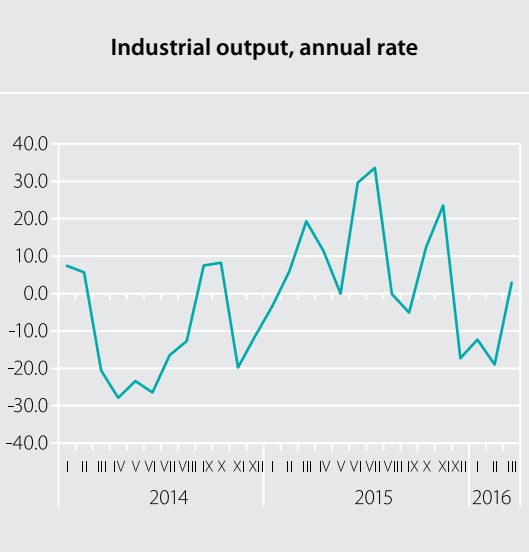
In Q1 2016, some 71,147 tourists visited Montenegro, which is a y-o-y increase of 9%. The number of domestic tourists arrivals increased by 6.1%, while the number of foreign tourists grew by 9.9%. Tourist nights amounted to 269,206, which is a y-o-y increase of 11.9%.

The production of wood products amounted to 14.618 cubic metres in Q1 2016, which was 62.6% more than in Q1 2015.[10]

The value of executed construction works amounted to 72.1 million euros in Q1 2016, recording a 12.3% y-o-y growth, and construction activity measured by effective working hours grew by 1.5%.

In Q1 2016, air passenger transport recorded y-o-y increase by 5.1%, while air freight transport remained unchanged. Road passenger transport recorded y-o-y increase by 15.4%[11], while road freight transport remained increased by 14.2%[12]. In Q1 2016, railway passenger transport recorded y-o-y increase by 12.9%[13], while railway freight transport decreased by 13.3%[14].

Graph 34



Source: Monstat

[10] This is shown as weighted index, while non-weighted output was 58.1% higher for the same period.

[11] Presented through number of passengers, while it increased by 1% presented in passenger kilometres

[12] Presented through transported goods in thousand tonnes, while it increased by 3.3% presented in passenger tonnes

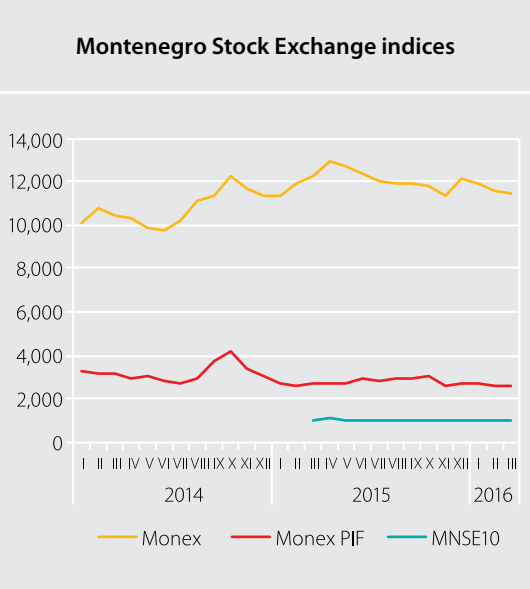
[13] Presented through number of passengers in thousands, while it increased by 16% presented in passenger kilometres

[14] Presented in thousand tonnes, while it decreased by 28.2% presented in passenger tonnes

3.3. Stock Exchange Indices

In Q1 2016, Monex stock exchange index recorded positive trends, whereby this index amounted to 11,410.33, declining by 717.74 index points or 5.9% compared to end-2015, and a y-o-y decline of 836.81 index points or 6.8%.

Graph 35



Source: Montenegro Stock Exchange

During the reporting period, MonexPIF also declined. As at end-March 2016, Monex PIF amounted to 2,576.74, and it was by 118.07 index points or 4.4% lower compared to end-2015, and by 74.27 index points or 2.8% compared y-o-y.

New established index MNSE10, introduced at Montenegro's capital market as of 1 April 2015, amounted to 986.17 in Q1 2016, and it declined by 58.57 index points or 5.6% compared to end-2015, and by 13.83 index points or 1.4% compared y-o-y.

4. MONETARY POLICY

In May 2016, the CBCG Council adopted the Decision Amending the Decision on Bank Reserve Requirement to Be Held with the Central Bank of Montenegro (OGM 33/16), which stipulates that banks that allocated and maintained up to 25% of the reserve requirements in T-bills until 31 December 2016, may continue to hold these T-bills as a part of the reserve requirement until their maturity, but not longer than 31 March 2017.

5. INFLATION FORECAST FOR 2016 AND Q1 2017

5.1. Model Assessment

Montenegro's inflation Fan Chart represents a graph of probability distribution of inflation rate presented by the consumer price index (CPICG). 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 movement in the following period. The Fan Chart is aimed at considering uncertainties in the real economy flows, which result in the inflation rate movement, and periodically reflected in inflation rate trend (increase in energy prices, increase/ decrease in the foreign trade deficit).

Fan Chart graph for 2016 and Q1 2017 is based on three estimated constituent parts:

1. **Central projection values** – the values of the Fan Chart central projection are derived from the ARIMA model;
2. **Degree of uncertainty** – determines the Fan Chart width. The degree of uncertainty ratios are obtained through analytical assessment and calculation of a relative impact of potential internal and external shocks that are possible in Montenegrin economy during 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 are "overestimated" or "underestimated" inflation rates. This will also influence the position of the mean value of inflation distribution.

Central projection of Fan Chart - ARIMA model for 2016 and Q1 2017

With a view to developing a Fan Chart, an ARIMA (AutoRegressive Integrated Moving Average) model was developed of time series of inflation of Montenegro showed through the Consumer Price Index[15].

[15] More detailed explanation of ARIMA model of Montenegro was presented in the Central Bank Working Paper 11 "Inflation forecasting: Empirical research of retail price index of Montenegro for 2007 – implementation of ARIMA model", 2007.

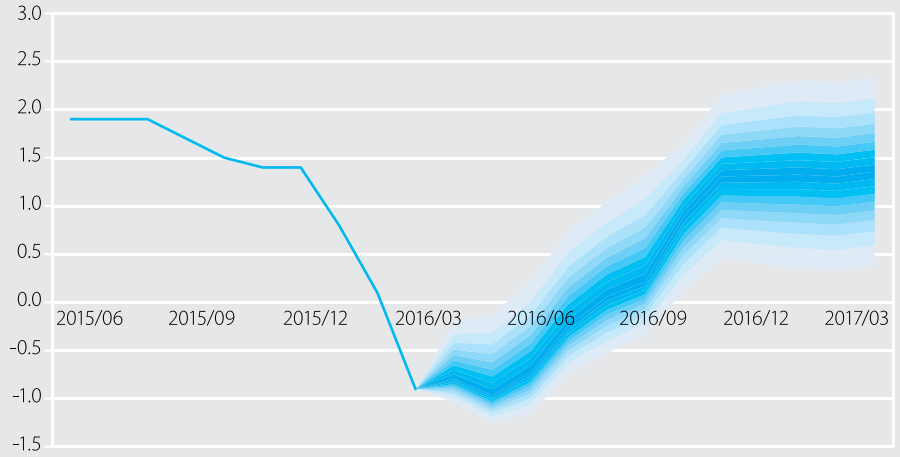
ARIMA model was used for short term forecasts (12 months), whereby iteration of 533 ARIMA models was made, which were ranked based on their efficiency and quality of diagnostics. The selected ARIMA model, ARIMA (1,1,12)[16] has sufficient confidence level for forecasts.

The monthly forecasts value was used as the value of central projection of the CPI graph for 2016. The obtained values represent the distribution mode, i.e. values with the highest frequency in the distribution of this time series.

Mean value of the obtained model is 0.4, while skewedness varies between 0.4 and 1.2. Standard deviation value was 0.2. Similarly to the projection for the previous quarter, the central band was placed in lower part of distribution, i.e. the corresponding degree of uncertainty was concentrated towards higher inflation levels, which are reflected in the graph above central "the deepest shade of blue" band. The Fan Chart presents a 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.[17] The Fan Chart has an equal number of bands (eight) on either side of the central band whereby every band is of the same colour, both above and below the central band, cumulatively takes the inflation projection to the next 10% of probability. As the degree of uncertainty grows over time, so the fan chart spreads.

Graph 36

CPI projections of Montenegro for 2016 and Q1 2017



Source: CBCG, 2016

[16] 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.

[17] The mode value (central projection) is, by construction, always in the deepest band shade, but in case of a heavily unbalanced risk, the central projection may 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 2016 and Q1 2017, indicates that **there is a 90% probability that the CPI inflation will range between -1.2% and 2.3%, depending on the month. At the same time, inflation at the end of 2016 is forecasted to range between 0.4% and 2.2%, with the central tendency of 1.3%**. The Fan Chart central projection (the darkest part) represents a 10% probability span (Graph 36).

Starting points for inflation forecast for 2016 and Q1 2017

Assumptions for inflation for three quarters of 2016 and Q1 2017:

1. Low inflation pressures from international environment, primarily low inflation in the Euro area and countries of the region, and low prices of primary products,
2. Prices of metals will remain low this year, due to slowing of Chinese economy;
3. Although international institutions estimated that food prices will decline this year, our estimate assumes agricultural products prices fluctuation of +/-5%, conditioned by their seasonal character;
4. expected stabilisation of oil prices trends, while oil price increase may be expected next year;
5. Potential increase in electricity prices up to 5% in August 2016;
6. wages and salaries growth of up to 3%;
7. Stabilisation of real estate prices;

Deviation of any of abovementioned parameters would require the correction of the forecast.

6. EXPECTED INFLATION IN 2016

Montenegro recorded deflation in Q1 2016. General global environment will have deflation effect in the upcoming period. This is confirmed by low inflation rates in the EU, Euro area and countries of the region, as well as expected trend in prices of oil and food products. Therefore, the presence of inflation pressures may not be expected in Montenegro in 2016.

The largest number of surveyed banks expected inflation rate from 1% to 1.5%, while the largest number of surveyed companies expected inflation rate from 0.5% to 1%. All estimates point to significant economic growth this year, which will also have deflation effect. The results of the surveyed companies confirm expectation on economic activity growth.

Compared to Q4 2015, aggregate demand declined, although slightly higher compared y-o-y. Potential increase in electricity prices and expected growth in salaries are factors that may affect the inflation growth. Still, these are not factors that may lead to more significant inflation growth.

Model assessment of inflation indicates that inflation during this year may range between -1.2% and 2.3%, while inflation for end-2016 may range between 0.4% and 2.2%. Our expert assessment is similar to the model, and it indicates that the inflation in end-2016 will range between -1% and 2%.

Table 3

Estimated inflation rate		
Optimistic assessment	Realistic assessment	Pessimistic assessment
-1%	0.5%	2%

This assessment is based on the same assumptions as the model assessment, thus the deviation of any parameters used for this forecast would require the revision of the assessment.