



CENTRAL BANK OF
MONTENEGRO

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Bulevar Svetog Petra Cetinjskog 6
81000 Podgorica
Telephone: +382 20 664 997, 664 269
Fax: +382 20 664 576

WEB SITE: <http://www.cbcg.me>

CENTRAL BANK COUNCIL: Milojica Dakić, MS, Governor
Velibor Milošević, PhD, Vice-Governor
Nikola Fabris, PhD, Vice-Governor
Asim Telačević
Milivoje Radović, PhD
Milorad Jovović, PhD
Srđa Božović, PhD

DESIGNED BY: Andrijana Vujović
Nikola Nikolić

TRANSLATED BY: Translation Services Division

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1. INFLATION INDICATORS

In the third quarter of 2015, consumer prices in Montenegro remained unchanged compared to the previous quarter. In this period, prices growth was recorded in the categories: *clothing and footwear* by 1.5%, *food and beverages*, and *housing, water, electricity, gas and other fuels* by 0.5% and *hotels and restaurants* by 0.4%. The fall in prices was recorded in the category of *transportation* by 4% and categories of *health* and *recreation and culture* by 0.1%. Looking at the trend of prices on a monthly basis, consumer prices growth was recorded in August (0.1%) and September (0.3%), while in July consumer prices decreased by 0.5%. At the annual level, consumer prices in September increased by 1.7%, while the average rate (period-on-period) amounted to 1.6%.

Table 1

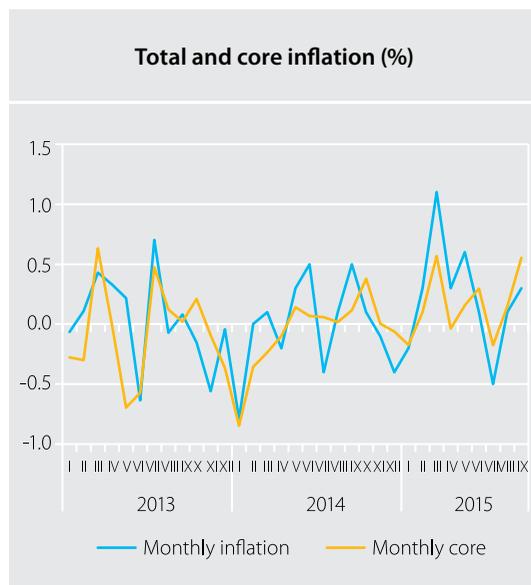
Inflation, %							
	2014				2015		
	III	VI	IX	XII	III	VI	IX
Change in relation to the end of the previous year	-0.8	0.0	0.0	-0.3	1.2	2.2	2.1
Annual change	-0.9	-0.1	-0.7	-0.3	1.6	1.9	1.7

Source: Monstat

During the third quarter, prices in the category *clothing and footwear* increased by 1.5%, mainly due to higher prices of clothing by 3.7%. Prices in the category *food and non-alcoholic beverages* increased by 0.5%, mainly due to the growth in prices of oil and fats by 5.3%, milk, cheese and eggs by 1.3%, vegetables by 0.4% and the price of meat by 0.1%. That caused the biggest positive contribution of food and non-alcoholic beverages to total inflation of 0.2 percentage points. Prices in the category of *housing, water, electricity, gas and other fuels* have also increased by 0.5% mainly due to the growth of the prices of solid fuels by 1.9%. Prices in category *hotels and restaurants* increased by 0.4% in this period due to increase in accommodation services by 1.4%. The biggest price drop of 4% was recorded in the category *transportation*, with the most reduced prices of fuels and lubricants by 8.1%. This category has made the largest negative contribution to overall inflation (-0.4 percentage points). During the third quarter, prices in categories *health care and recreation* and *culture* declined by 0.1%. Prices in categories of *alcoholic beverages and tobacco*, *household equipment and routine household maintenance*, *communications*, *education* and *other goods and services* remained unchanged in the third quarter.

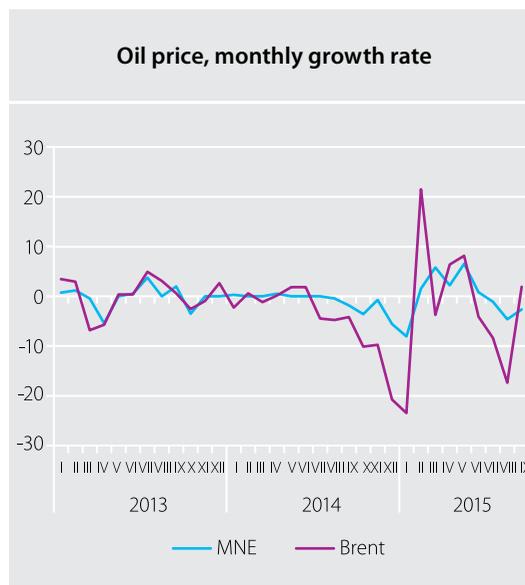
The monthly **core** inflation in July, August and September recorded higher level than the official monthly inflation, but only in July both, core and official monthly inflation, recorded negative rate.

Graph 1



Source: Monstat

Graph 2



Monstat and "Monthly Oil Market Reports", OPEC

Table 2

Share of individual categories in total inflation ¹				
	Weights	IX 15/VI 15 index	rate	contributions
Total	1000	100.0	0.0	0.0
Food and non-alcoholic beverages	386.4	100.5	0.5	0.2
Alcoholic beverages and tobacco	37.9	100.0	0.0	0.0
Clothing and footwear	70.7	101.5	1.5	0.1
Housing, water, electricity gas and other fuels	153.1	100.5	0.5	0.1
Furnishing, household equipment and routine household maintenance	46.9	100.0	0.0	0.0
Health care	38.2	99.9	-0.1	0.0
Transportation	101.0	96.0	-4.0	-0.4
Communications	57.1	100.0	0.0	0.0
Recreation and culture	27.2	99.9	-0.1	0.0
Education	15.7	100.0	0.0	0.0
Hotels and restaurants	23.0	100.4	0.4	0.0
Other goods and services	42.8	100.0	0.0	0.0

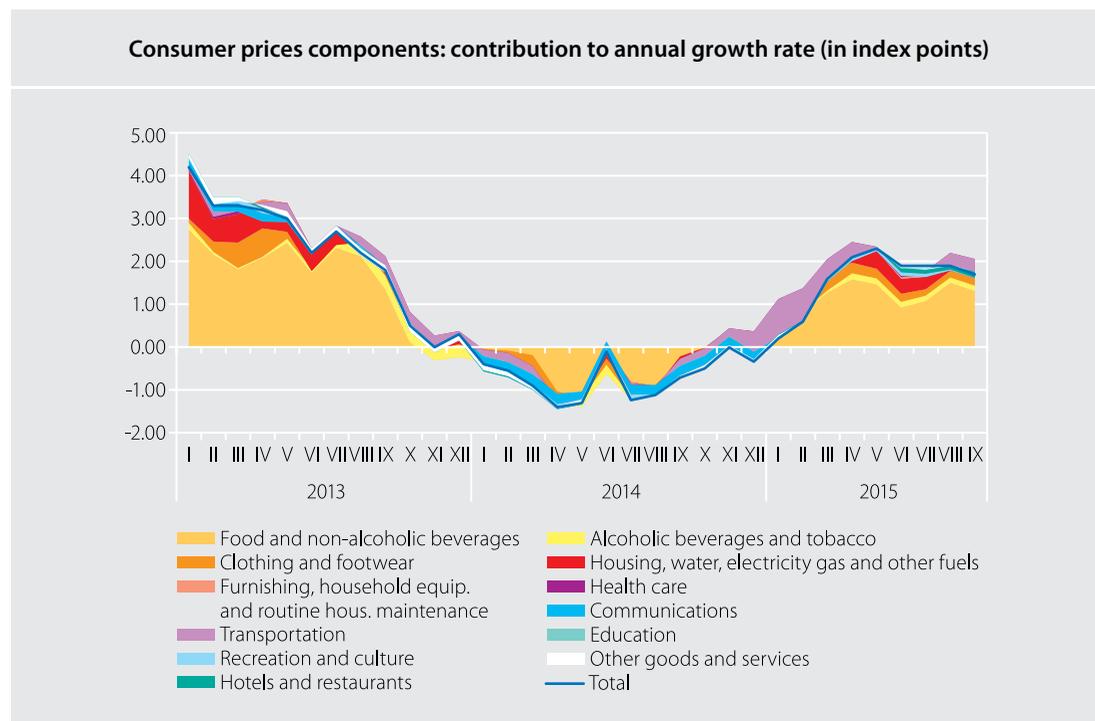
Source: Monstat and CBCG calculations

In the third quarter of 2015 there was a decline in oil prices in relation to the second quarter. Price of OPEC reference basket, on average, amounted to 48.2 USD/barrel, which is 19.6% less compared to the average price in the second quarter of this year. The average price of Brent oil amounted to 50.3 USD/barrel, which is 18.7% less compared to the average price in the second quarter of this year. Observing

¹ We note that, despite the index changes, the contribution of the share of some categories due weighting structure is recorded only on the second or third digit.

by quarters, the average price of Brent oil in the third quarter of this year recorded the lowest level since the first quarter of 2009 (when it amounted to 44.4 USD/barrel). The fall in oil prices at world markets in the third quarter is a result of oversupply pressure at the oil market, as well as economic instability, particularly in the industrial sector of China. Minimum price of Brent oil was recorded in August, when it stood at 46.72 USD/barrel, which is the lowest price in the first nine months of this year.

Graph 3



Source: Monstat and CBCG calculations

The annual rate of consumer prices in September was 1.7%, declining by 0.2 percentage points compared with the annual rate from June. The highest annual increase was recorded in prices from the category *hotels and restaurants* 6.2%, *food and non-alcoholic beverages* 3.4%, *clothing and footwear* 3.3%, *alcoholic beverages and tobacco* 3.2%, *health care* 2.3%, *housing, water, electricity, gas and other fuels* 1.8%, *furnishings and routine maintenance of the apartment* 0.6%, *recreation and culture* 0.3% and *other products and services* 0.1%, while the annual decline of prices was recorded by *transportation* -4.4% and *communications* -0.1%, while prices in the category *education* remained unchanged.

In September, **producers' prices of manufactured products** increased by 0.1% in relation to end-2014. Growth in prices was recorded in manufacturing industry by 0.2%, while prices of mining and quarrying decreased by 0.6%. Prices in the sector of electricity, gas and water supply remained unchanged. On an annual basis, prices of industrial products increased by 0.1%.

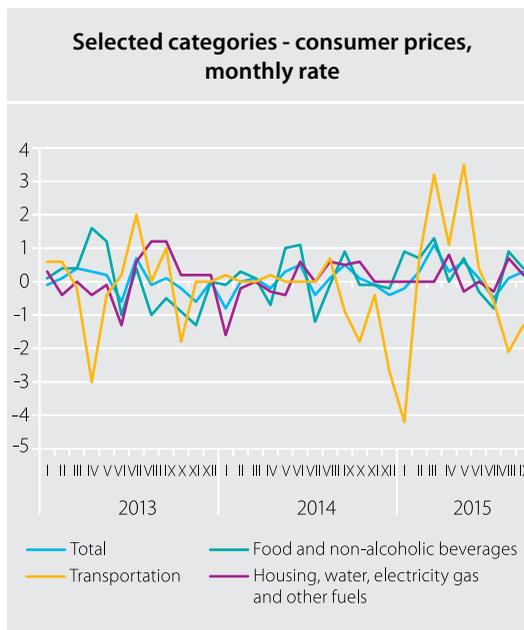
Comparing annual inflation recorded in Montenegro and inflation in selected countries, it can be seen that the positive inflation rate was recorded only in Albania (2.2%), Montenegro (1.7%), Serbia (1.4%) and the Czech Republic (0.2%). The highest negative annual growth rate was recorded in Bosnia and Herzegovina (-1.8%) and Romania (-1.5%) and from neighbouring countries, negative rate, except Bosnia and Herzegovina, was recorded in Croatia (-0.5%) and Macedonia (-0.2%).

Graph 4



Source: Monstat

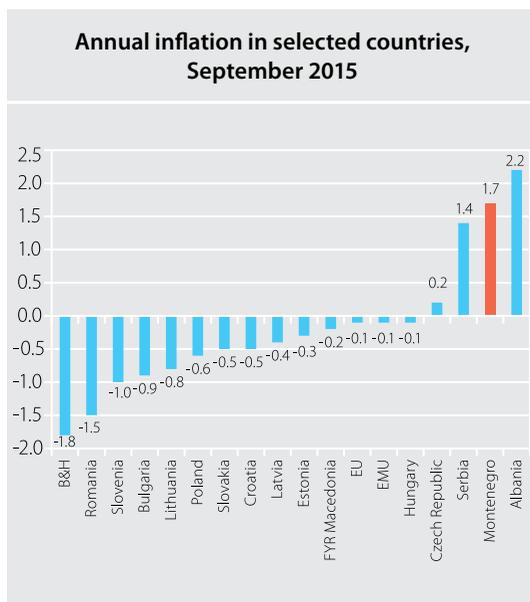
Graph 5



Source: Monstat

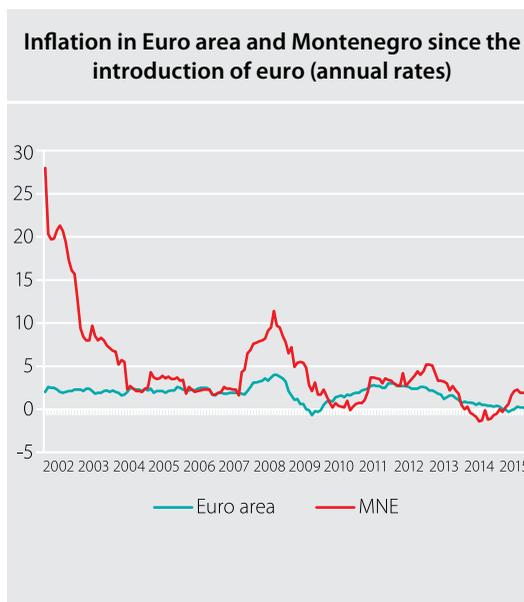
The annual rate in the Euro area, as measured by the harmonized index of consumer prices stood at -0.1%, while in Montenegro, also measured by the harmonized index of consumer prices it was 2.3%, which was 2.4 percentage points more than in the Euro area.

Graph 6



Source: National statistical offices and Eurostat

Graph 7



Source: Monstat and Eurostat

2. INFLATION EXPECTATIONS

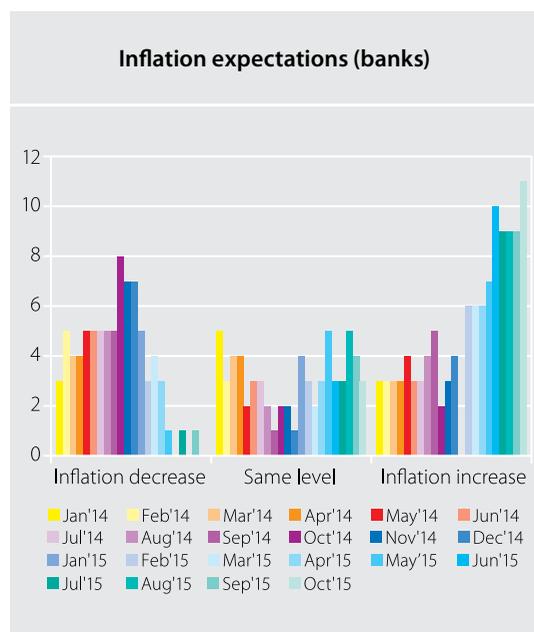
2.1. Bank's Expectations

When it comes to inflation expectations of banks, based on the survey conducted in October this year, eleven banks expected higher inflation rate, the same level of inflation was expected by three banks, while lower inflation rate in 2015 compared to 2014 was not expected by any bank (Graph 8).²

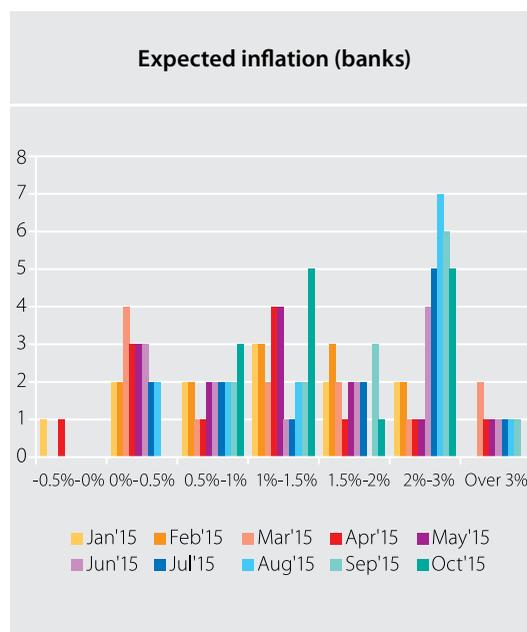
As Graph 9 shows, five banks expected inflation to range between 1% and 1.5% and between 2% and 3% by the year-end, three banks expected inflation to range from 0.5% to 1%, while one bank expected inflation in the range of 1.5% to 2%.

Regarding expectations about the lending interest rates, eleven banks expected decline, while three banks expected the same level of nominal interest rates. Regarding effective interest rates, twelve banks expected decline, while two banks expected the same level.

Graph 8

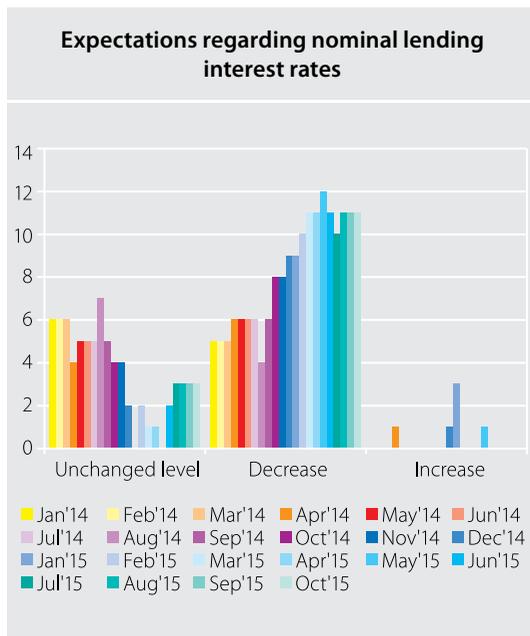


Graph 9

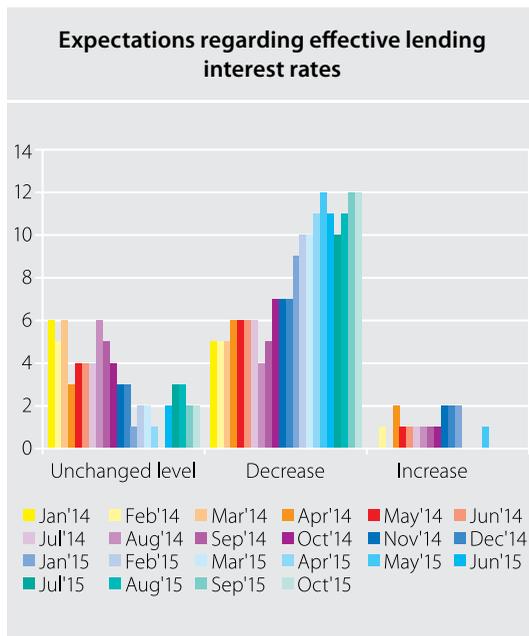


² Since August 2015 the survey included a new Ziraat banka.

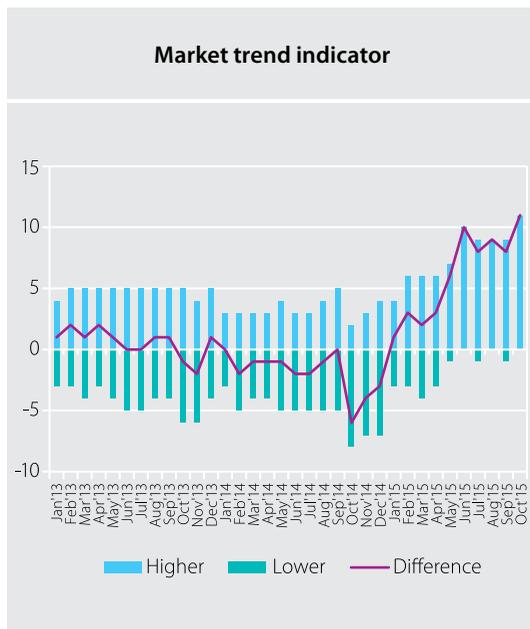
Graph 10



Graph 11



Graph 12



When it comes to anticipation of trends in deposit interest rates, twelve banks anticipated decline, while two banks expected the same level of deposit interest rates in 2015 compared to 2014.

For the purpose of calculating inflation expectations we use market trend indicator (line in the Graph 12). It is calculated as the difference between the number of banks expecting an inflation growth and the number of banks that expect a decrease in inflation. If the market trend indicator has a negative value, decline in the inflation rate is expected in the coming period. If there is a positive value, rise in inflation is expected in the coming period. If there is a zero value, we expect unchanged inflation rate in the coming period. The more negative value, inflation expectations are lower and positive value are higher which represents a higher level of inflation expectations. During the previous year, inflation expectations, with minor variations, were significantly low, while during the first ten months of 2015 they increased.

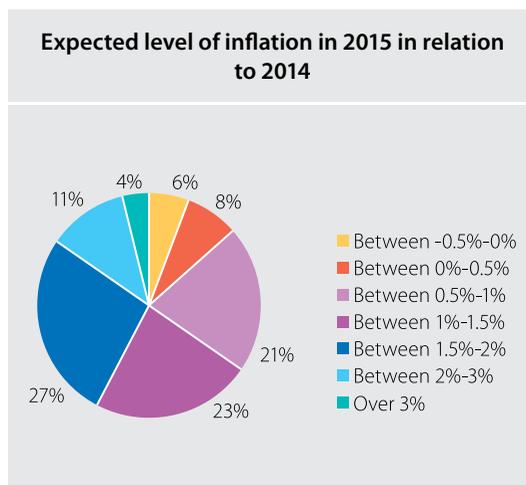
2.2 Corporate Sector Expectations (Except Banks)

Inflation

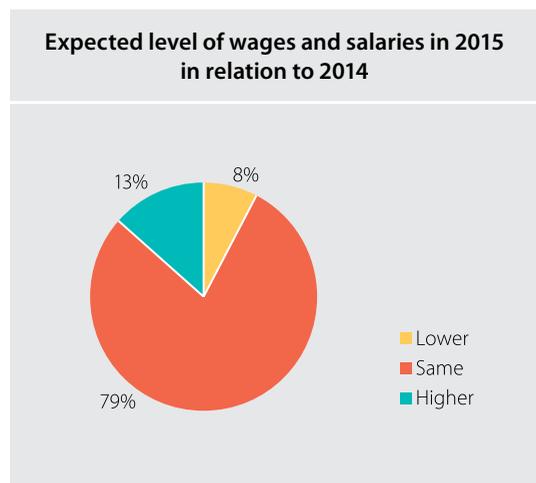
Of the total number of surveyed companies majority of them, some 27%, believes that inflation will range between 1.5% and 2% in 2015. Some 23% of companies expected that the inflation will range between 1% and 1.5%, 21% expected an inflation rate of 0.5% to 1%, and inflation between 2% and 3% was expected by 11% of surveyed companies. That inflation will range between 0% and 0.5% was expected by 8% of companies, while 6% of surveyed companies expected inflation to be between -0.5% and 0%. Of the total companies surveyed, 4% expected inflation above 3%. That wages will not change in 2015 compared to the previous year was expected by 79% of the surveyed companies, lower level of income was expected by 8%, and the increase was expected by 13% of the surveyed companies. In terms of the number of employees in the same period, 52% of companies believed that the number will not change, 25% expected an increase, while 23% believed the number of employees will decrease in the current compared to the previous year.

The majority of surveyed companies (about 71%) expected the same level of prices of production inputs which are used while 83% of respondents expected the same prices of their products (services) in 2015.

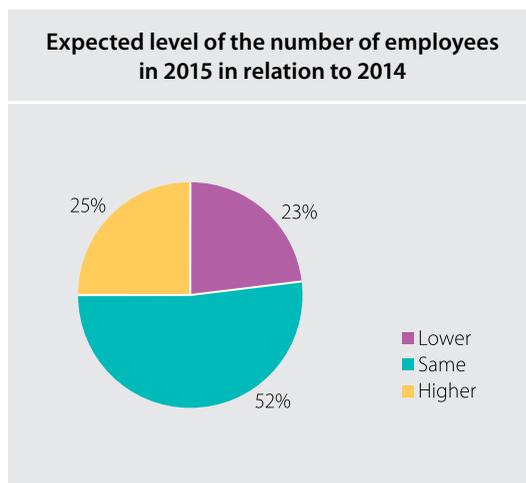
Graph 13



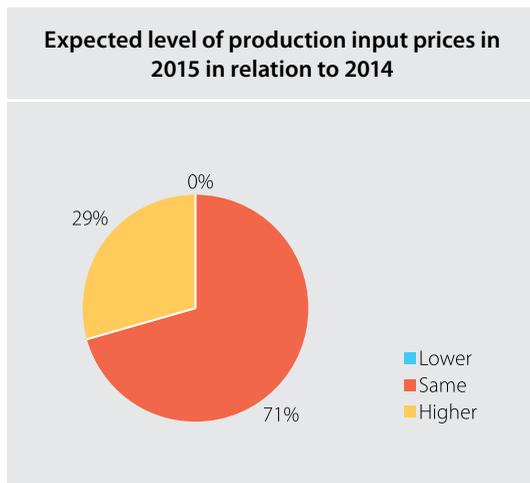
Graph 14



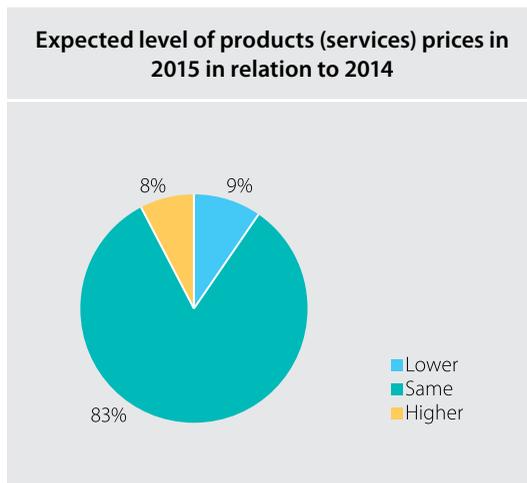
Graph 15



Graph 16



Graph 17

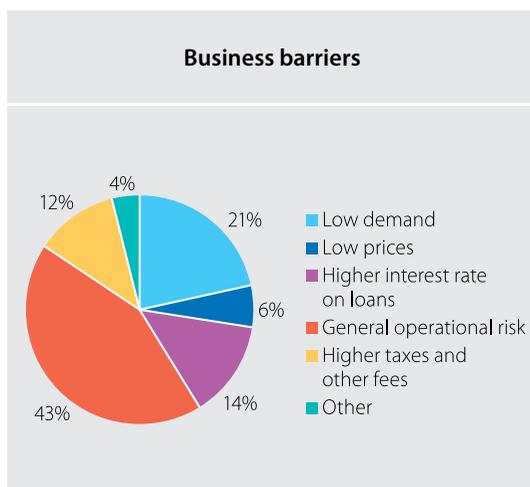


Business environment

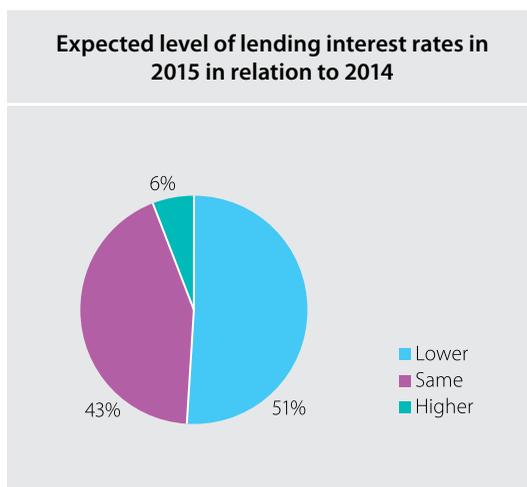
The survey results show that most of the surveyed companies in the field of business barriers see general business risks (43%) as an obstacle, as well as low demand (21%), high interest rates on loans (14%) and too high taxes and other forms of levies (12 %).

In addition, 51% of surveyed companies expected a lower level of lending rates, 43% expected the same level, while 6% expected a higher level of lending interest rates in 2015 compared to 2014.

Graph 18



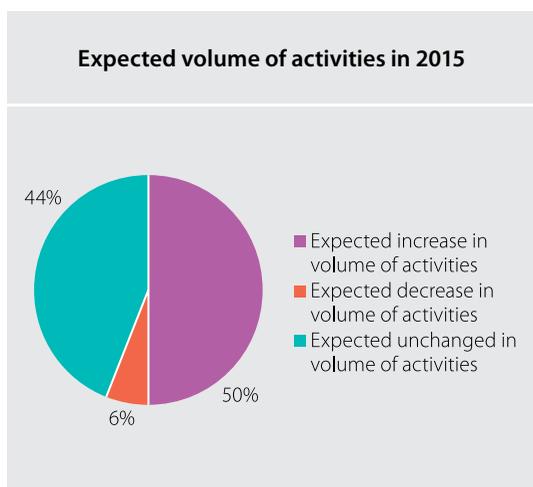
Graph 19



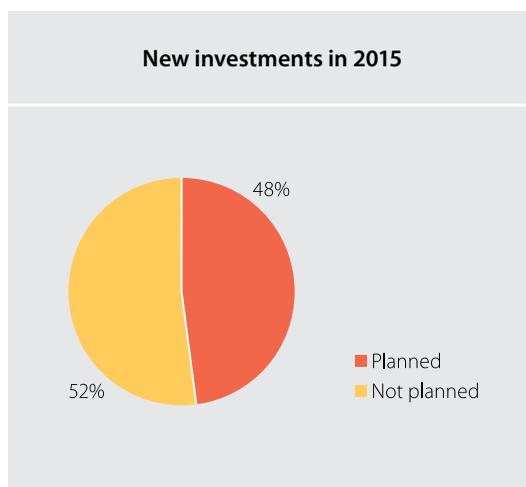
Investments

Of the total number of surveyed companies, 50% of them is planning to increase the volume of activities during 2015, while 48% of respondents are planning new investments. The largest number of investments (42%) referred to the increase in fixed assets, while low demand (31%), insufficient use of existing capacity (27%), high interest rates and unfavourable conditions for capital indebtedness (19%), other barriers (15%) represented the largest obstacles to new investments, as well as high production costs (8%).

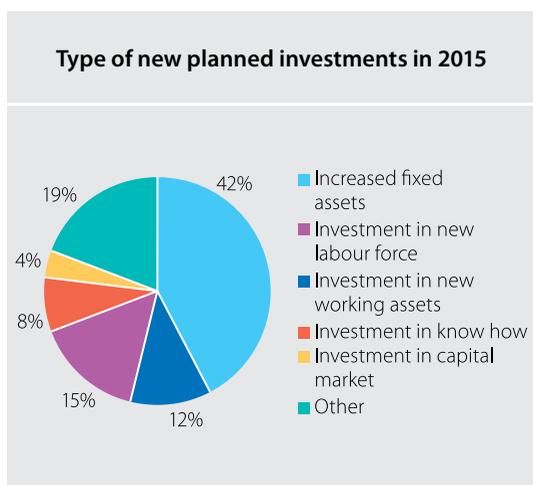
Graph 20



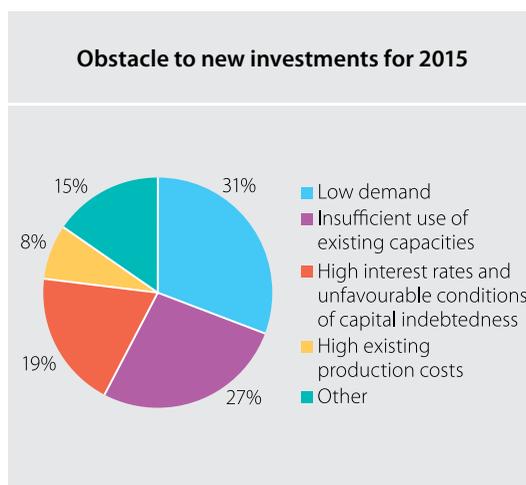
Graph 21



Graph 22



Graph 23



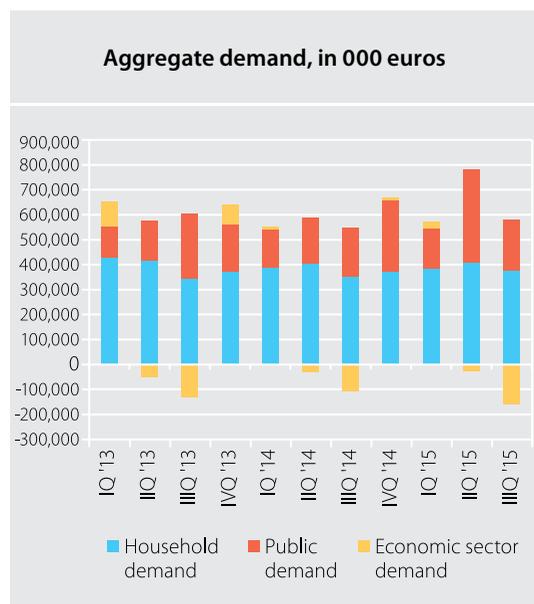
3. INFLATION DETERMINANTS

3.1. Demand

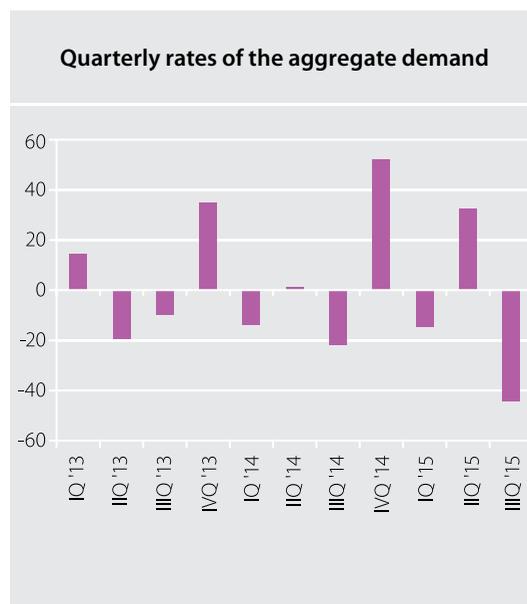
According to preliminary data, aggregate demand recorded a decline compared to the previous quarter, as well as compared to the third quarter of 2014. Observing the structure of total demand, compared to the structure of the previous quarter, the share of the public sector and the economy reduced, while the share of the household sector increased.

The level of aggregate demand in the third quarter of 2015 was lower than the level of aggregate demand in the same period of the previous year, as well as the level of demand in the previous quarter.

Graph 24



Graph 25



Box 1 - Methodology of calculation of aggregate demand

For the more complete monitoring of aggregate demand as the inflation determinant, the CBCG has developed the methodology for calculating the aggregate demand. The starting point of this methodology is that the aggregate demand is the sum of three sectors: personal consumption (households), investment consumption (corporate sector) and public consumption. However, given the lack of a large number of data needed for calculating the aggregate demand, the existing data on aggregate demand should not be treated as an indicator of the exact amount of aggregate demand, but as an indicator of the aggregate demand trend. In the existing methodology, series of important data such as: corporate investments, revenues from selling shares, non-market income, the income generated in the informal economy, and the like, are not available. The methodology for calculating the aggregate demand is shown in 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 savings by households (savings - loans granted)

I = net savings of economy (deposits - loans)

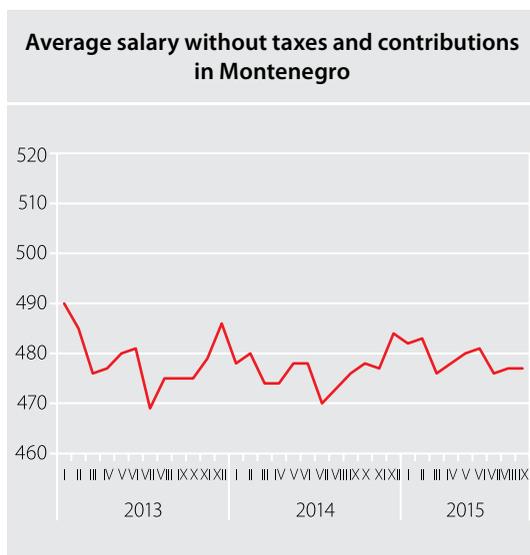
G = public consumption - paid pensions - salaries paid from the budget - net savings by the Government (deposits - loans - Treasury bills)

AD - aggregate demand, C - personal consumption, I - investment consumption, G - public consumption

3.1.1. Wages and Salaries and Other Available Demand Determinants

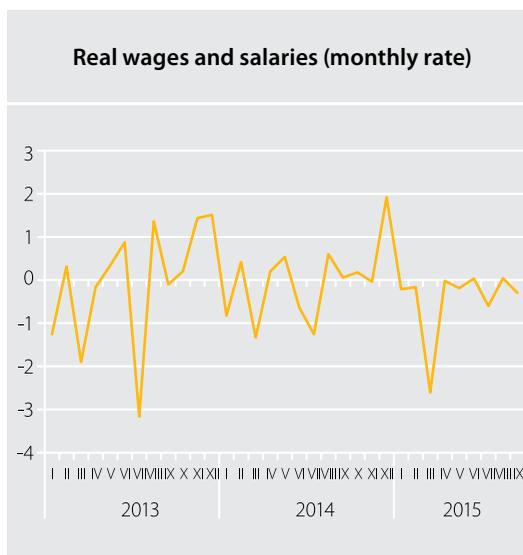
The average salary in Montenegro in the third quarter was 720 euros, while the average salary without taxes and contributions amounted to 477 euros. Regarding the previous quarter, the average wages and salaries fell by 0.8%, while average wages and salaries without taxes and contributions decreased by 0.6%.

Graph 26



Source: Monstat

Graph 27



Source: Monstat

If we take into account the consumer prices, i.e. if we observe wages and salaries trends in real terms, it can be concluded that real wages and salaries in the third quarter recorded a slight decrease in July and September, while in August a slight growth in real wages was recorded.

Lending to the household sector during the nine months of 2015 recorded a positive trend. The average monthly growth of this loans amounted to 0.3% (while in the same period of 2014 they recorded growth at an average rate of 0.1%). At the end of the third quarter of 2015, total loans to the household sector amounted to 914.2 million euros, which was 20.5 million euros or 2.3% more than at the end of 2014, or 21.5 million euros or 2.4% more than in the same period of the previous year.

Per capita debt³ amounted to 1,470 euros at the end of September 2015, and was 33 euros higher than at the end of 2014 and for 34 euros higher than at the end of the third quarter of the previous year.

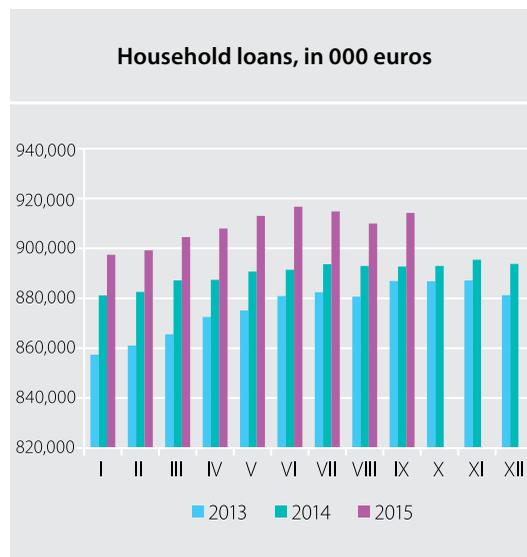
Total loans of MFIs granted to the household sector amounted to 42.2 million euros at the end of September 2015, which was 6.1 million euros or 17% more than at the end of the previous year, and 8 million euros or 23.3% more than a year before.

During the first three quarters of 2015, deposits of the household sector recorded an average monthly increase of 0.7% (in the same period of 2014 they recorded an average monthly growth of 0.6%). Deposits of this sector amounted to 1,411.3 million euros at the end of September this year and were 79.5 million euros or 6% higher than at the end of 2014, or 111.2 million euros or 8.6% higher than in same period of the previous year.

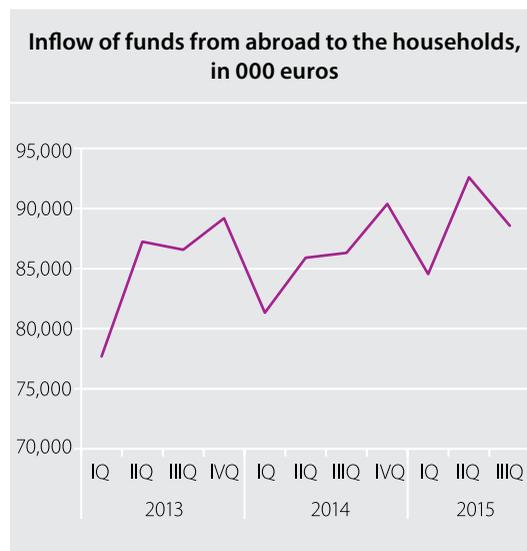
At the end-September 2015, the loans to deposits ratio for this sector amounted to 0.65 and was lower compared to the previous year when it stood at 0.67, i.e. at a lower level compared to the same period of the previous year when it stood at 0.69.

The household sector recorded net savings in amount of 497 million euros, which is 59 million euros or 13.5% higher than at the end of 2014, or 89.7 million euros or 22% higher than in the same period of the previous year.

Graph 28



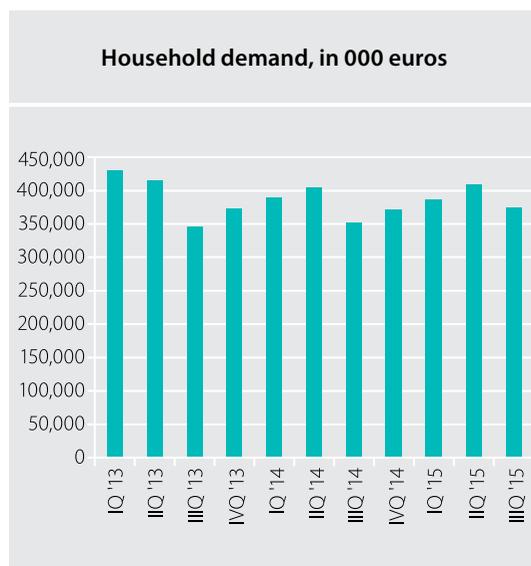
Graph 29



Source: CBCG

³ Source: Monstat assessment on the population, 31 December 2014.

Graph 30



Balance of payments statistics shows that, in the third quarter of this year, compared to the previous quarter, recorded a drop from the inflow of funds from abroad to the households.

Observing the total demand of household sector by quarters (according to preliminary data), it can be noted that the demand in the third quarter of this year decreased compared to the demand in the previous quarter. Demand growth of households was recorded in comparison to the demand from the third quarter of 2014.

3.1.2. Budget Analysis

Budget of Montenegro

For the first nine months of 2015, according to preliminary data from the Ministry of Finance, budget of Montenegro recorded total revenues⁴ in the amount of 1.51 billion euros.

Source revenues amounted to 963.6 million euros or 26.3% of the projected GDP⁵, and in relation to the plan they recorded an increase of 0.8%, compared with the same period of 2014 budget revenues were by 2.5% higher. In the structure of source revenues, the highest share of 62.3% were revenues from taxes, contributions 31.7%, fees 2.1%, other income 2%, taxes 1%, receipts from repayment of loans 0.5% and donations 0.4%.

Tax revenues amounted to 600.4 million euros and recorded a decrease of 3.7% compared to the plan, and compared to the same period of 2014 they were lower by 0.6%. Compared to the same period of 2014, the highest growth was recorded in the collection of excise duties, which were higher by 6.1 million euros or 5.2% as a result of the increase in excise duties on tobacco and activities undertaken to reduce shadow economy at the market of excise duties products.

Nominally, the highest decline in revenues compared to the previous year was recorded on personal income tax of 6.1 million euros or 8.7%. Also, revenues from value added tax declined by 2.7 million euros or 0.8%, corporate income tax 1.7 million euros or 4.1% and real estate taxes 0.1 million euros or 9.4%.

⁴ Revenues include current revenues (direct and indirect taxes and non-tax revenues), borrowings and loans from domestic and foreign sources, as well as revenues from the sale of assets.

⁵ Source: Ministry of Finance; the estimated GDP for 2015 amounted to 3,660.7 million euros

Revenues from contributions amounted to 305.5 million euros and were higher by 10% compared to the plan for the first nine months of 2015, while compared to the same period in 2014 they increased by 7.3%.

Budget expenditures for the first nine months of 2015 amounted to 1.21 billion euros or 33% of GDP. Actual expenditures in relation to the plan for the first nine months of the current year were higher by 3% and increased in comparison with the same period of 2014 by 19.8%, or 199.5 million euros, mainly due to increased capital expenditures of 154 million euros, followed by transfers to institutions, individuals, NGO and public sector (an increase of 24 million euros), repayment of obligations from previous years (an increase of 23.7 million euros) and due to the growth of current budgetary expenditures in the amount of 11, 5 million euros.

Current expenditures amounted to 1.01 billion euros or 27.7% of GDP, while the capital budget amounted to 195.8 million euros or 5.3% of GDP.

Current budget expenditures in the reporting period amounted to 477.2 million euros and were 0.7% higher than planned. Almost all expenditures, except expenditures for other personal income, for services, interest and rent, were below plan.

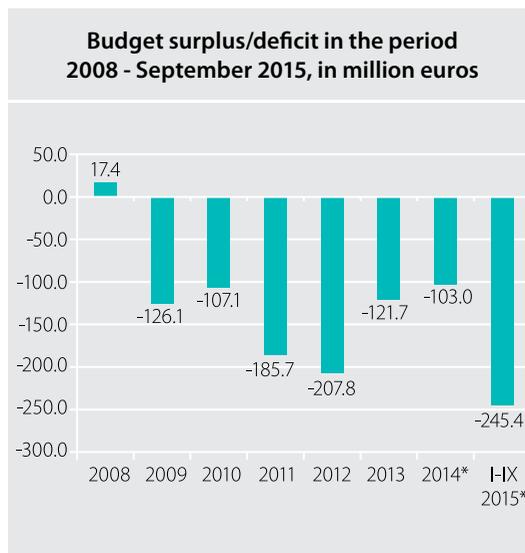
Budget deficit of Montenegro was estimated to 245.4 million euros or 6.7% of GDP.

3.1.3. Corporate Sector

Due to lack of data on investments in the corporate sector, as an approximation we can use net indebtedness of this sector.

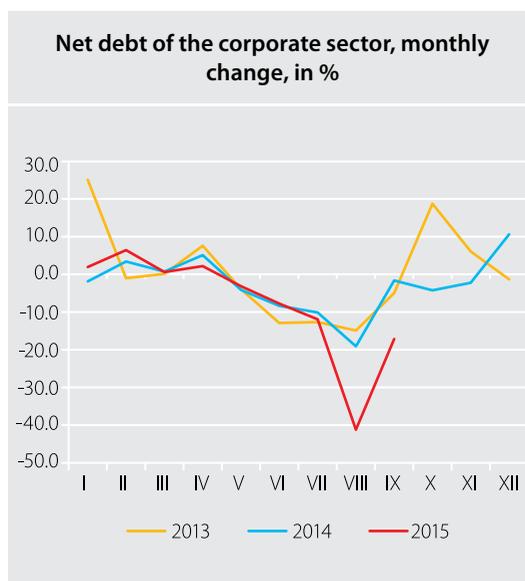
Loans to the corporate sector were significantly higher than deposits of this sector. Thus, net debt of the corporate sector amounted to 118,6 million euros at the end of the period, and was by 158.7 million euros or 57.2% lower than at the end of 2014, while compared to the end of the third quarter of the previous year was lower by 148,9 million euros or 55.7%. In the structure of loans to this sector, long-term loans were dominant with 74.8% indicating that the loans the corporate sector were dominantly used for increasing the volume of economic activity.

Graph 31



Source: Ministry of Finance

Graph 32

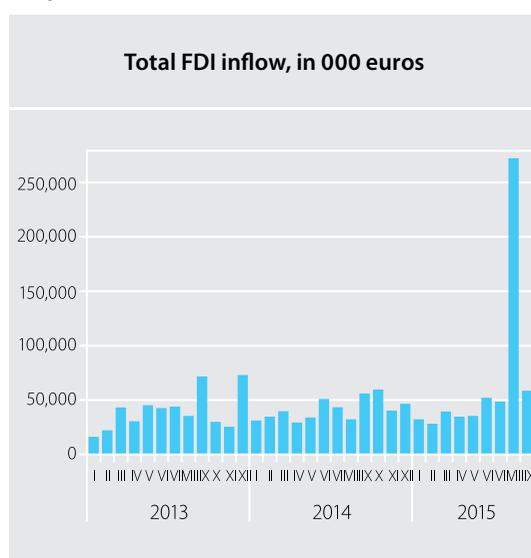


3.1.4. External Demand - Balance of Payment

In the first nine months of 2015 there was a decline in the current account deficit, which is the result of an increase in the services account surplus and primary income. According to preliminary data, the current account deficit amounted to 208.5 million euros or 26.6% less compared to the same period in 2014. In the reporting period there was an increase in goods account deficit of 7.5%, as a result of a decrease in exports of goods by 12.1% while imports increased by 3.7%. Such developments were largely affected by the reduction in exports of meat and meat products, aluminium and aluminium products, while the increase in imports was largely a result of higher imports of machinery and transport equipment.

The international invisible trade of Montenegro in the first nine months of 2015 recorded a surplus of 777.7 million euros, which is 17.2% more than in the same period last year. Primary income account recorded a deficit of 58.6 million euros, which is significantly higher than in the same period of 2014 when it amounted to 14.2 million euros. The secondary income account (transfers) recorded a surplus in the amount of 74 million euros, which is 5.9% less than in the same period last year.

Graph 33



Source: CBCG

In the period January - September 2015 an upward trend of FDI inflow was recorded. According to preliminary data, net FDI inflow in the first nine months of 2015 amounted to 526.4 million euros, which represented an increase of 101.6% compared to the same period in 2014. Total FDI inflow amounted to 601.6 million euros, while there was also an outflow in the amount of 75.2 million euros. In the structure of FDI inflow, equity investments amounted to 410.7 million euros, while the inflow in the form of intercompany debt amounted to 185.3 million euros.

In the first nine months of 2015, portfolio investments account recorded a net inflow of 191.1 million euros as a result of government borrowing by issuing euro bonds at the international capital market. Movements in other investments account are characterized by reduction of liabilities of banks and other sectors (of the corporate

sector) from borrowings, while state liabilities increased. In the reporting period, there was also an increase of 210 million euros in deposits from banks abroad. As a result of these trends, other investments account recorded a net outflow of 569.5 million euros in the first nine months of 2015.

3.2. Supply and Production

The total industrial production in the first nine months of this year recorded an increase of 9.2% compared to the same period last year. Production growth was recorded in manufacturing industry by 16.1% and the sector of electricity, gas and steam supply by 1.1%, while mining and quarrying re-

corded a decline of 0.1%. Observing monthly data on industrial production, the highest growth was recorded in July (32.9%) and February (10.1%), while the largest decrease was recorded in May (24.3%) and August (21.3%).

In the first nine months of 2015, Montenegro was visited by 1.6 million tourists, which is 13% more than in the same period of the previous year. In the same period, overnights amounted to 10.6 million, which is by 15.5% more than in the same period in 2014. Foreign tourists accounted for 93.6% of total overnights.

Total production of **wood products** in the first nine months of this year amounted to 247,278 m³, which is 23.9%⁶ more than in the same period last year.

According to preliminary data, the value of completed **construction work** for the first nine months of the year was 7% higher than in the comparative period, while construction activity measured by effective working hours increased by 4.8%.

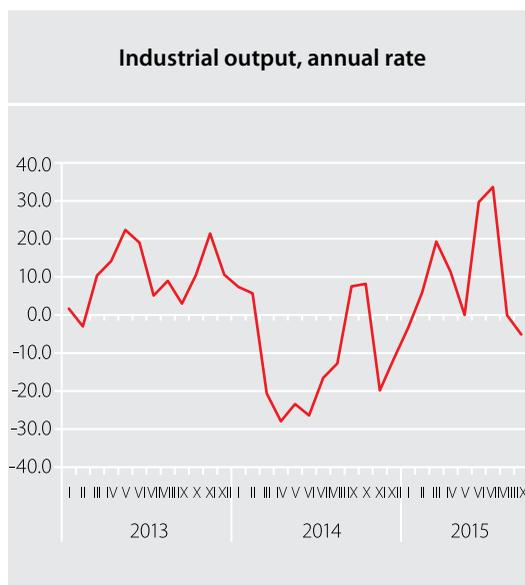
In the first nine months of 2015, road passenger transport recorded increase of 1.9% compared to the same period of the previous year, while cargo transport increased by 16.3%. Transport of passengers in railway transport was higher by 11.1% and the cargo transport by 22.6%. In air transport the number of passengers at airports, for the first nine months of 2015, compared to the same period last year, increased by 1.6%, while cargo transport increased by 5.1%.

Total turnover in ports amounted to 1.2 million tonnes and was higher by 27.8% compared to the same period of the previous year, while exports accounted for 58.3% and import 41.6%. Exports in this period increased by 79.7 while import decreased by 8.9%.

3.3. Stock Exchange Indices

After a slight decline recorded in January 2015, movement of Monex stock exchange index was characterized by the growth in the next three months, after which this index started to decline. The decline stopped in September. At the end of September 2015, Monex amounted to 11,949.79 and recorded a growth of 593.68 index points or 5.2% compared to the previous year, and an increase of 555.56 index points or 4.9% compared to same period last year.

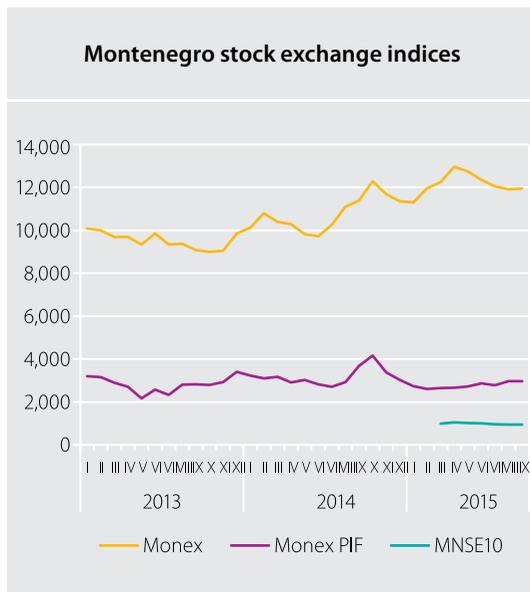
Graph 34



Source: Monstat

⁶ Expressed by weighted index, while expressed by non-weighted index, production was 29.3% higher for the same period

Graph 35



Source: Montenegro stock exchange

On the other hand, the index of investment funds Money PIF has fluctuated during the period. At the end-September of the current year, Monex PIF index stood at 2970.60 and was by 66,78 index points or 2.2% lower than at the end-2014, i.e. 713.80 index points or 19.4% lower at the annual level.

New MNSE10 index, which was introduced at the Montenegrin capital market on 1 April 2015, continued a downward trend. This index stood at 954.06 at the end of the third quarter and declined by 48.94 index points or 4.9% compared to its initial value.

Compared to their historical maximum values (reached in 2007), at the end of September 2015 indices were lower: Monex - 4.1 times and Monex PIF - 17.1 times lower.

4. MONETARY POLICY

In the third quarter no decisions on monetary policy had been adopted.

5. INFLATION FORECAST FOR 2015 AND FIRST THREE QUARTERS OF 2016

5.1. Model Assessment

Montenegro's inflation Fan Chart represents a graph of probability distribution of inflation rate presented by the consumer price index. In that direction, instead of determining concrete points, using the distribution of probability the Fan Chart includes potential risks and uncertainties which would in the future period influence the movement of inflation. 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 (higher food and energy prices, increase/ decrease in the foreign trade deficit).

Montenegro's fan chart for 2015 and Q3 of 2016 was based on the following three estimated components:

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.

Fan Chart central projection - ARIMA Model for 2015 and the first three quarters of 2016

With a view to developing a fan chart, an ARIMA (Auto Regressive Integrated Moving Average) model was developed of time series of inflation of Montenegro showed through the Consumer Price Index.⁷

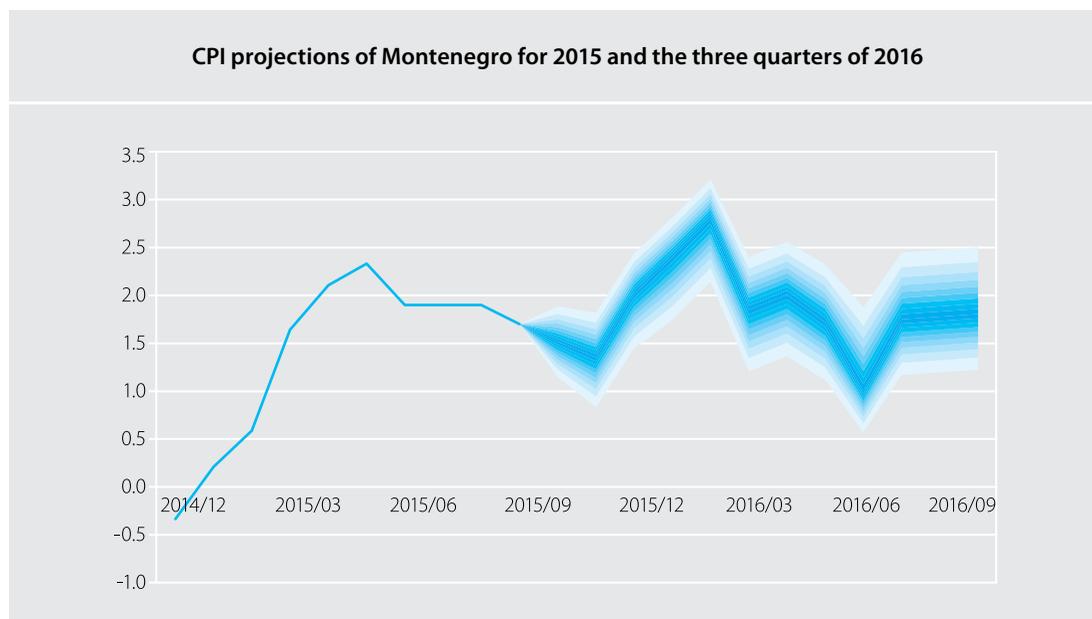
⁷ Detailed explanation of the ARIMA model of Montenegro was presented in the working study of the Central Bank no. 11 "Inflation Forecasting: Empirical research trends of retail price index of Montenegro for 2007-implementation of ARIMA model"

ARIMA model was used for short term forecasts (12 months), whereby iteration of ARIMA models was made, which were ranked based on their efficiency and quality of diagnostics. The selected ARIMA model (1, 1, 12), ARIMA has sufficient confidence level for forecasts.⁸

The monthly forecasts value was used as the value of central projection of the CPI Fan Chart for 2015 and Q3 of 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 1.8. Value of the obtained model varied between 0.5 and 1, while standard deviation value was 0.25. The central band was placed in lower part of distribution, especially for 2015, i.e. the corresponding degree of uncertainty was concentrated towards higher inflation levels, which are reflected in the graph through the „thicker“ band concentrated above “the deepest shade of blue” central 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 probability⁹. The fan chart has an equal number of bands (eight) on either side of the central band whereby every band which is of the same colour, in the sum, 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



Source: CBCG, 2015

⁸ 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.

⁹ The mode value (central projection) is, by construction, usually 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)

Montenegro's inflation Fan Chart based on the ARIMA model projection for 2015 and Q3 2016 shows, with a 90% probability that, depending on month, CPI inflation will vary between 0.5% and 3.3%. Inflation ranging between 1.2% and 2.6% with the central tendency of 2% is projected for end-2015. Namely, with the rise of time horizon for projecting, uncertainty also grows, thus extending the range of the forecast.

Inflation forecast for 2015 and Q3 2016:

1. Low inflationary pressures from the international environment, particularly low inflation and the low prices of primary products;
2. Metal prices will remain low in the next year, due to the slowdown in the Chinese economy;
3. Given the growth of oil supply at international markets, conditioned by the weakening of global economy and falling demand for oil, it is expected that oil prices will remain low in the observed period;
4. Fluctuation in prices of agricultural products of +/-5%, conditioned by their seasonal character;
5. Potential increase of the electricity price of 5% in December 2015, as well as its increase in August 2016;
6. Continued implementation of the crisis tax on personal income above 720 euros also in 2016, with the reduction of the tax rate from 13% to 11%.
7. Stabilization of prices at the real estate market;

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

6. EXPECTED INFLATION IN 2015

In 2015, a situation which repeated several times in the past happened again, that prices adjustment is done with a certain time delay. Thus, in 2014 we had a negative rate of inflation and higher rates of inflation than in the Euro area, and this year recorded a higher growth rate than the one in the Euro area.

Inflation expectations are high, which is quite expected bearing in mind that in the previous year we had a negative inflation rate. Inflation in 2015 will be at a very acceptable level of about 2% which represents the long-term goal.

Stable inflation is expected also in 2016, because most factors will act disinflationary. Aggregate demand is declining, compared to the previous quarter, as well as in comparison with the third quarter of the previous year. On the other hand, production increased. Expectations of the corporate sector point to further growth in investment and production, which will act disinflationary. Also, the inflation pressures are not expected either from the international environment.

Our expert estimate for the end of 2015 is similar to the model and we expect that inflation will range from 1.5% to 2.5%.

Table 3

Inflation rate estimate		
Optimistic estimate	Realistic estimate	Pessimistic estimate
1.5%	2%	2.5%

Experts' assessment is based on the same assumptions as the model assessment. The change in any parameter used for this forecast would require a new forecast.