



CENTRAL BANK OF
MONTENEGRO

INFLATION REPORT QUARTER I, 2014

PUBLISHED BY: Central Bank of Montenegro
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

Users of this publication are requested to make reference to the source of information whenever they use data from the Report.

CONTENTS

1. INFLATION INDICATORS	5
2. INFLATION FORECASTS OF BANKS	9
3. INFLATION DETERMINANTS	14
3.1. Demand	14
3.1.1. Salaries and other available demand determinants	15
3.1.2. Budgetary analysis	17
3.1.3. Economy	18
3.1.4. External demand and the current account	19
3.2. Supply and production	19
3.3. Stock exchange indices	20
4. MONETARY POLICY	22
5. INFLATION FORECAST FOR 2014 AND Q1 2015	23
5.1. Model assessment	23
6. EXPECTED INFLATION IN 2014	26

1. INFLATION INDICATORS

Measured by consumer prices, inflation in Montenegro recorded negative trend amounting to -0.8% in March compared to December 2013. During this period, the highest decline was recorded by the prices of clothes and footwear by 4.8% and prices of communications by 3.6%. Observing the prices' trend on a monthly basis, consumer prices growth was recorded only in March (0.1%), a decline in January (-0.8%), while in February prices did not change amounting to 0.0%. The average rate of consumer prices (the first three months of 2014 compared to the same period of the year) also had a negative trend amounting -0.6%.

Table 1

	Inflation, %				
	2013				2014
	III	VI	IX	XII	III
Change in relation to previous year-end	0.5	0.4	1.1	0.3	-0.8
Annual change	3.3	2.2	1.8	0.3	-0.9

Source: Monstat

Prices in the category *food and non-alcoholic beverages* rose by 0.3% in March compared to December 2013. Within this category, there is an increase in the prices of fruits (16.7%), vegetables (2.7%), meat (0.2%) and other food products (1.7%). Prices of milk, cheese and eggs declined by 0.5%, bread and cereals by 1.7%, oil and fats by 11.8%, fish by 0.5% and prices from the group sugar, jam, honey, chocolate and confectionery products by 1.5%. In Q1 2014, prices of non-alcoholic beverages increased by 0.2%, while the prices of *health care* increased by 1.8%, mainly due to higher prices of pharmaceutical products by 2.9%. During this period there was a growth in prices of *transportation* by 0.2% and prices in the category *hotels and restaurants* by 0.3%, while prices in the category *education* did not change. Prices decline in the categories *clothing and footwear* by 4.8%, *housing, water, electricity, gas and other fuels* by 1.8% *communications* by 3.6% with an overall negative contribution of 0.8 percentage points mainly led the total inflation rate. Prices decline was recorded in the following categories: *furniture and routine maintenance* (-1.0%), *recreation and culture* (-1.7%) and *other products and services* (-0.9%). In the category of *education* there were no changes of the prices in March 2014 compared to December 2013.

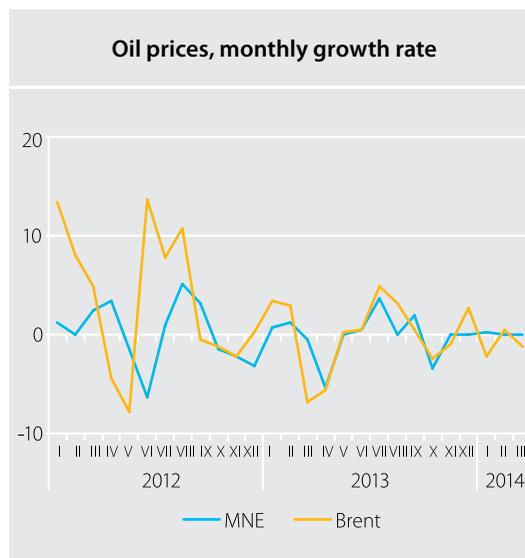
Annual inflation in March this year recorded negative trend amounting -0.9%, while the annual inflation rate, measured by the harmonized index of consumer prices amounted to -0.4%.

Graph 1



Source: Monstat

Graph 2



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

Monthly core inflation in February and March recorded lower level than official monthly inflation, while in January both inflations were at the same level. In Q1, core inflation was negative, and officially released monthly inflation recorded a negative growth rate only in January.

In Q1, oil prices at world markets recorded decline compared to the prices in the last quarter of the previous year. Average price of OPEC reference basket was 104.7 US dollars/barrel or 1.6% less than the price from

Table 2

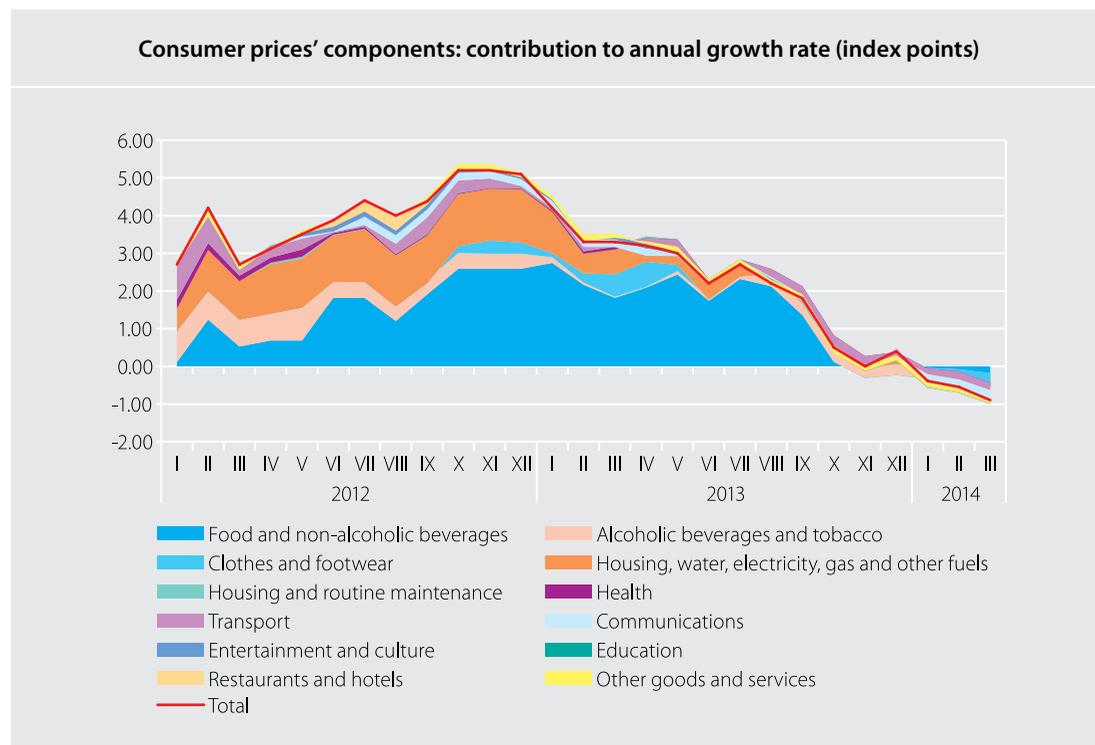
Share of individual categories in total inflation*					
	Weight	III 14/XII 13	Growth rate	Contributions	Share in total inflation
TOTAL	1000	99.2	-0.8	-0.8	100.0
Food and non-alcoholic beverages	386.4	100.3	0.3	0.1	-16.1
Alcoholic beverages and tobacco	379	100.2	0.2	0.0	-0.9
Clothes and footwear	70.7	95.2	-4.8	-0.3	46.1
Housing, water, electricity, gas and other fuels	153.1	98.2	-1.8	-0.3	37.5
Housing and routine maintenance	46.9	99.0	-1.0	-0.1	6.1
Health	38.2	101.8	1.8	0.1	-9.1
Transportation	101.0	100.2	0.2	0.0	-2.1
Communications	57.1	96.4	-3.6	-0.2	27.9
Entertainment and culture	27.2	98.3	-1.7	-0.1	6.3
Education	15.7	100.0	0.0	0.0	0.0
Hotels and restaurants	23.0	100.3	0.3	0.0	-0.8
Other goods and services	42.8	99.1	-0.9	0.0	5.0

* We would like to note that, despite the index changes, the share of certain categories is recorded only at the second or the third digit, due to the weighting structure.

Sources: Monstat and CBCG calculations

the last quarter of the previous year. The average price of Brent amounted to 108.2 US dollars/barrel, which was about 1% lower than the price from Q4 of the previous year. The highest price of Brent during the first quarter of this year was recorded in February (108.87 US dollars/barrel), and was lower by 1.8% than the price in December 2013. Prices declined in March due to a slowdown in global demand for this fuel, improved supply, as well as concerns about the slowdown in the manufacturing sector of Eurozone and China.

Graph 3



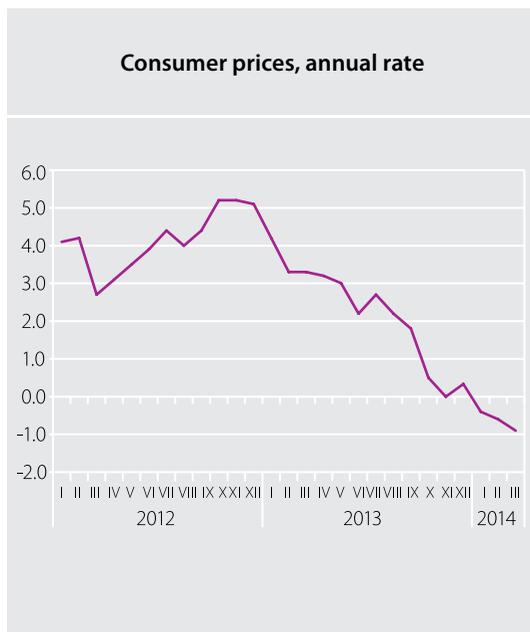
Source: Monstat and CBCG calculations

Decline in prices in categories: *food and non-alcoholic beverages* by 1.2% and *clothes and footwear* by 4.9% provided the highest contribution (-0.8 percentage points) to total annual negative inflation rate of 0.9%. The annual decline in prices was recorded in the category of *transportation* (-1.9%), *communications* (-4.3%), *recreation and culture* (-4.4%) and *household equipment and routine household maintenance* (-0.3%), while of *alcoholic beverages and tobacco* (7.5%), *health* (2.7%), *education* (0.2%), *hotels and restaurants* (0.6%) and *other products and services* (1.5 %) recorded increase. Prices in the category of *housing, water, electricity, gas and other fuels* remained unchanged.

In relation to end-2013, **producers' prices of manufactured products** increased by 0.6% in March, whereby mining and quarrying prices increased by 3.9%, manufacturing prices by 0.4%, while the prices of electricity, gas and steam did not change. Producers' prices of manufactured products recorded y-o-y decrease of 0.3%.

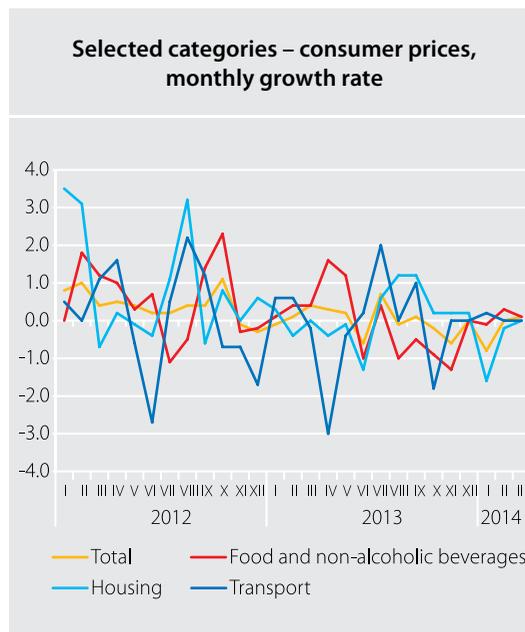
The comparison of annual inflation recorded in Montenegro with the inflation in selected countries shows that four countries recorded negative inflation rate: Bulgaria (-2.0%), Bosnia and Herzegovina (-1.6%), Croatia (-0.4%) and Slovakia (-0.2%). The highest annual inflation in the region was recorded in Serbia (2.3%) and Albania (2.2%).

Graph 4



Source: Monstat

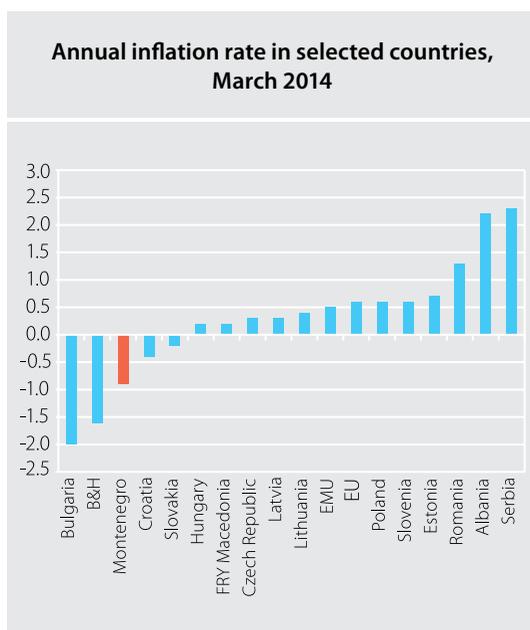
Graph 5



Source: Monstat

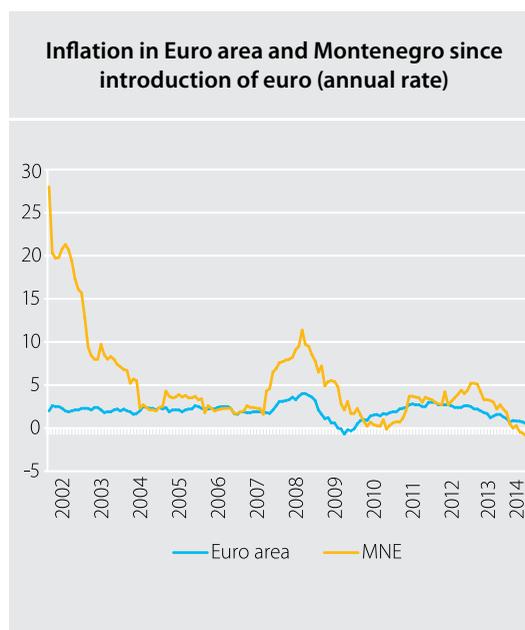
Measured by Harmonized Index of Consumer Prices (HICP), annual inflation growth rate recorded in Euro area amounted to 0.5%. Inflation in Montenegro measured by consumer prices was negative amounting to 0.9%, while annual inflation in March, measured by HICP amounted to -0.4%.

Graph 6



Source: National Statistical Offices and Eurostat

Graph 7



Source: Monstat and Eurostat

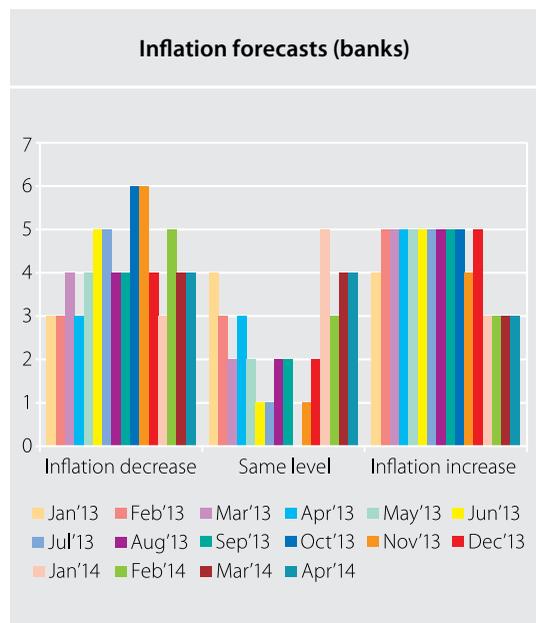
2. INFLATION FORECASTS OF BANKS

Regarding inflation forecasts of banks, based on the survey conducted in April 2014, four banks expected lower inflation rate, while four banks expected the same inflation rate. Three banks expected higher inflation rate in relation to 2013 (Graph 8).

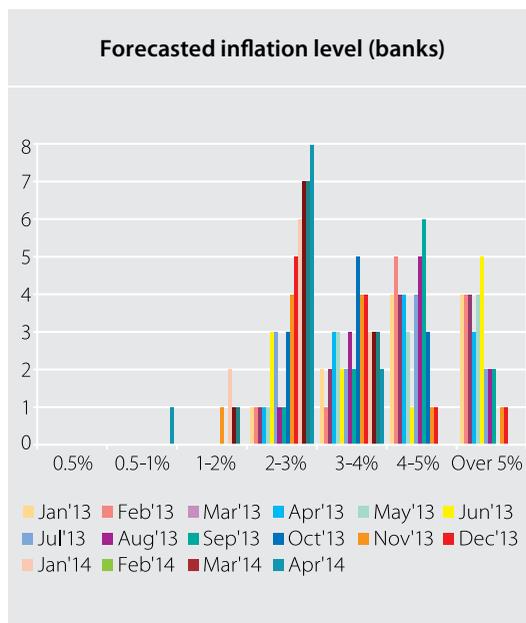
There were different expectations of banks with regards to the inflation. Eight banks expected inflation to range from 2% to 3%. Two banks expected the inflation to range from 3% to 4%. Two banks expected the inflation to range from 3% to 4% while one bank expected the inflation to range from 0.5% and 1% (Graph 9).

Concerning the forecasts on lending interest rates, four banks forecasted unchanged levels, six banks expected a decline of nominal interest rate while one bank expected its growth. On the other hand, three banks expected unchanged amount of effective interest rates, six banks expected a decline while two banks forecasted the increase in effective lending interest rates.

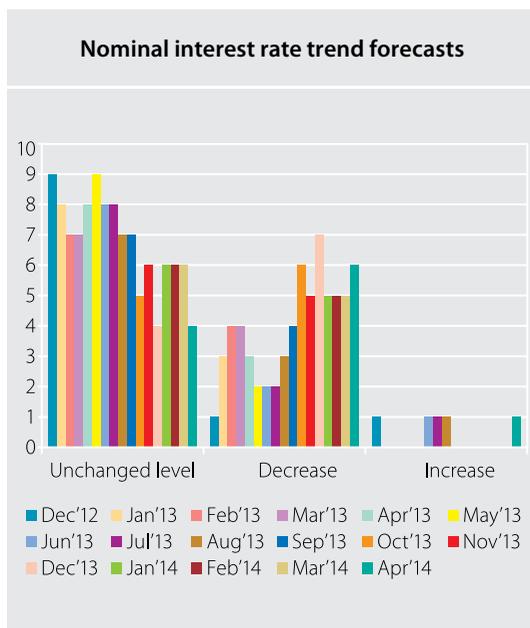
Graph 8



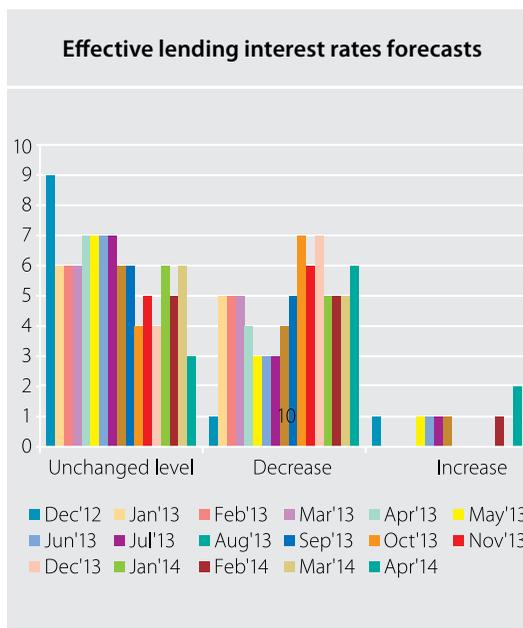
Graph 9



Graph 10

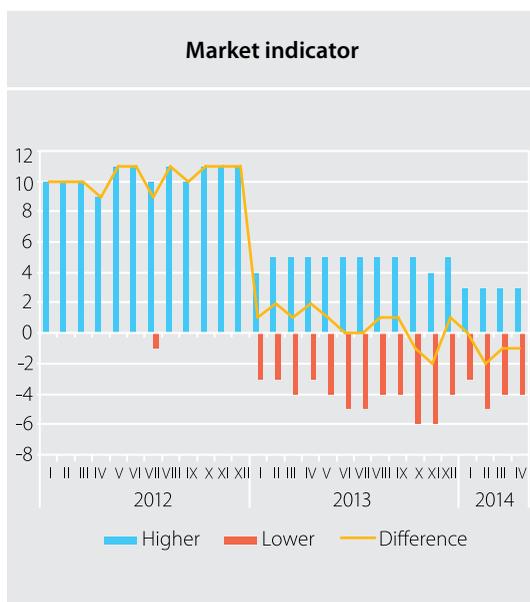


Graph 11



Regarding the deposit interest rates, eight banks expected unchanged level, while three banks expected a decline in deposit interest rates.

Graph 12



For the purpose of calculating inflation forecasts we use market trend indicator (orange line in Graph 12). It is calculated as the difference between the number of banks expecting an inflation growth (blue columns) and the number of banks expecting inflation decrease (red columns). 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, while higher positive value means higher inflation level forecasts. During 2013, inflation forecasts recorded low level with slight oscillations, and this trend continued in the first four months of 2014, especially due to the decline in number of banks who expected the inflation growth.

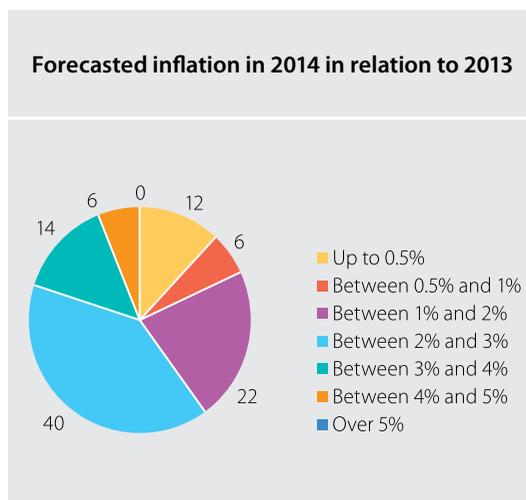
Expectations of economy (except banks)

Inflation

Of the total number of surveyed companies, the largest number, 40% of them, considered that inflation will range between 2% and 3% in 2014. Some 22% of surveyed companies expected that inflation will range between 1% and 2% and 14% expected the inflation between 3% and 4%. Some 12% of respondents expected that the inflation will fall down to 0.5%, while 6% of the surveyed companies expected inflation from 0.5% to 1% and 4% to 5%. Any of interviewed companies expected inflation over 5%. Some 9% of surveyed companies expected lower level of earnings, 78% expected that earnings will not change in 2014 compared to 2013, and the increase is expected by 13% of surveyed companies. As for the number of employees in the same period, 61% of respondents believe that the number will not change, 22% expected the increase, and 17% forecasted the decline in the number of employees compared to the previous year.

The majority of surveyed companies (47%) expected the same level of prices of production inputs, and 77% respondents expect the same prices of its products (services) in 2014.

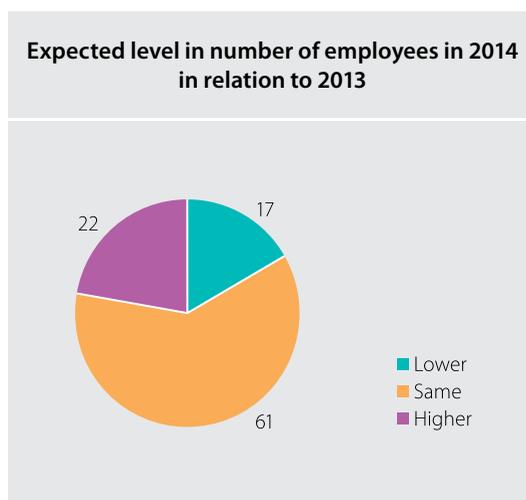
Graph 13



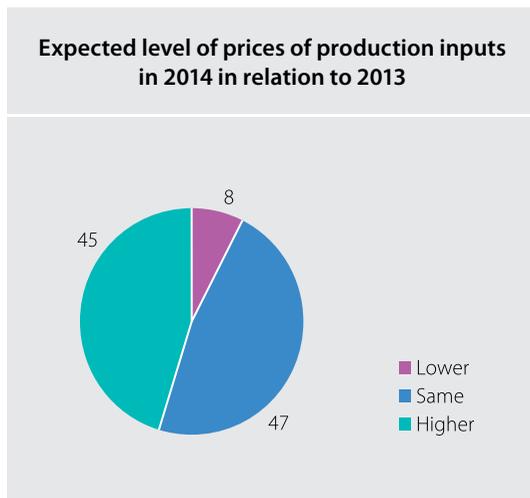
Graph 14



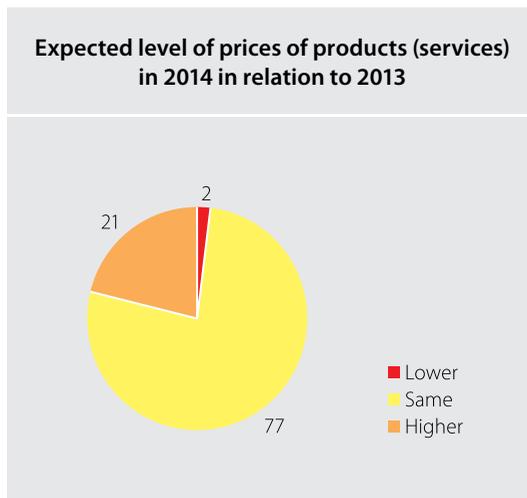
Graph 15



Graph 16



Graph 17

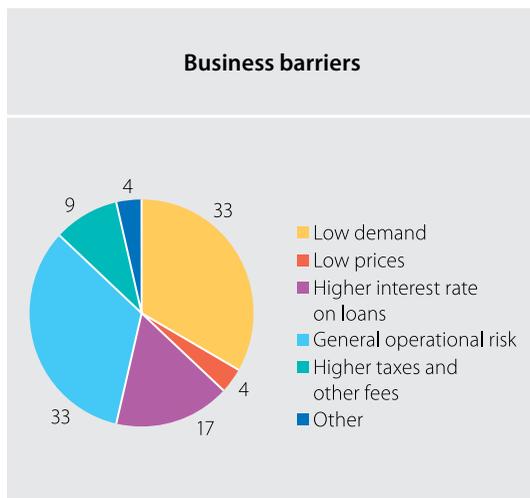


Business Environment

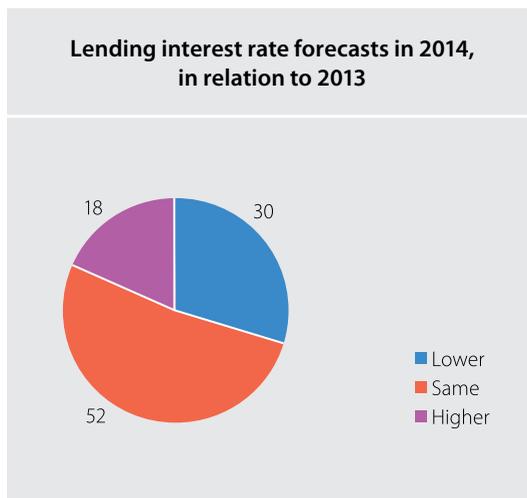
The survey results showed that most of the surveyed companies saw low demand (33%), general operational risks (33%) and high lending interest rates (17%) as a red tape.

In addition, 52% of surveyed companies expected unchanged levels, 30% lower level, while 15% of them expected higher lending interest rates in 2014 relative to 2013.

Graph 18



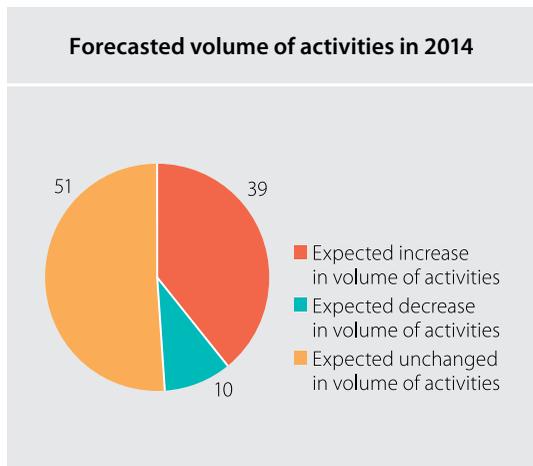
Graph 19



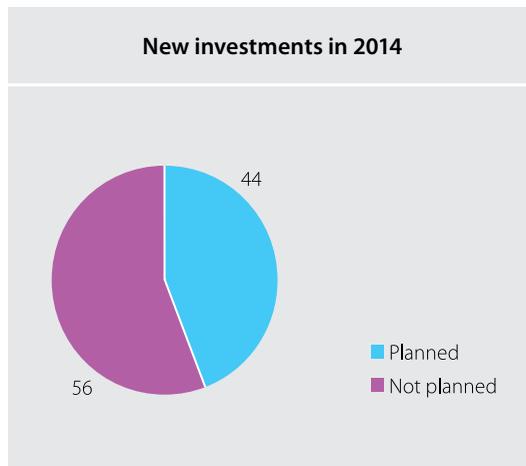
Investments

Out of the total number of surveyed companies, 39% planned the increase in volume of activities during 2014 i.e. 44% of surveyed companies planned new investments. Most investments (74%) referred to the increase in fixed assets, while low demand (44%), other obstacles (30%), high interest rates and unfavourable conditions for capital borrowings (13%), insufficient exploitation of existing capacities (9%) and high production costs (4%) were described as largest barriers to new investments.

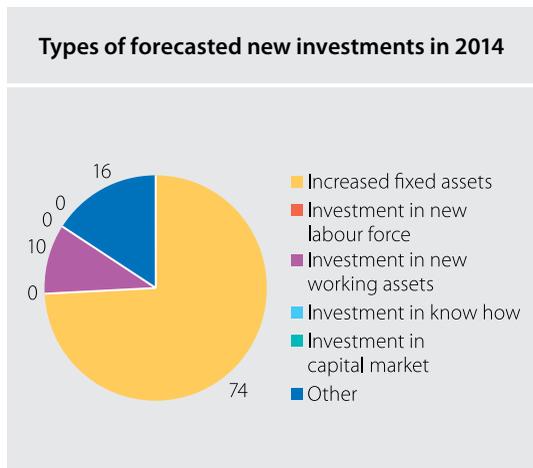
Graph 20



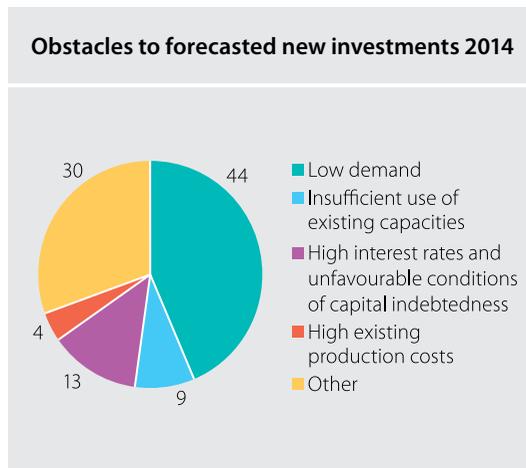
Graph 21



Graph 22



Graph 23



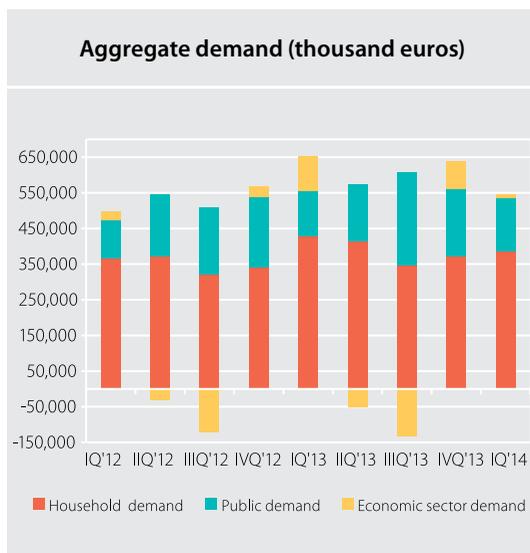
3. INFLATION DETERMINANTS

3.1. Demand

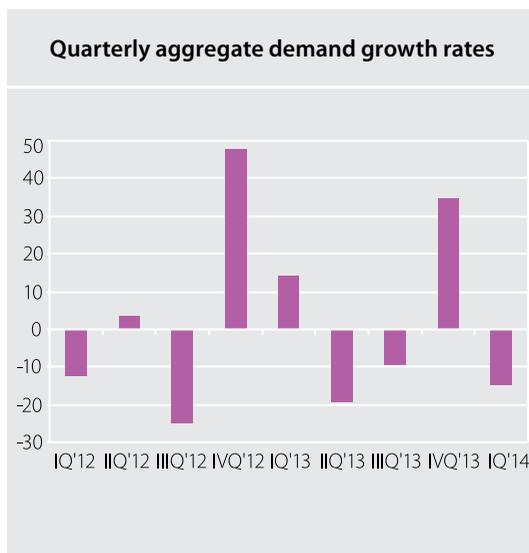
According to preliminary data, aggregate demand recorded decrease in Q1 2014, compared to the same period of 2013, as well as compared to Q4 2013. Compared to Q4 2013, the share of households' demand increased, while public consumption decreased.

Aggregate demand recorded decrease in Q1 2014 compared to Q1 2013, as well as compared to the level recorded in Q4 2013.

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 is that the aggregate demand is the total demand of three sectors: personal consumption (households), investment consumption

(corporate sector) and public consumption. 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 incomes, non-observed economy revenues, and the like. The methodology for calculating the aggregate demand is given 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)

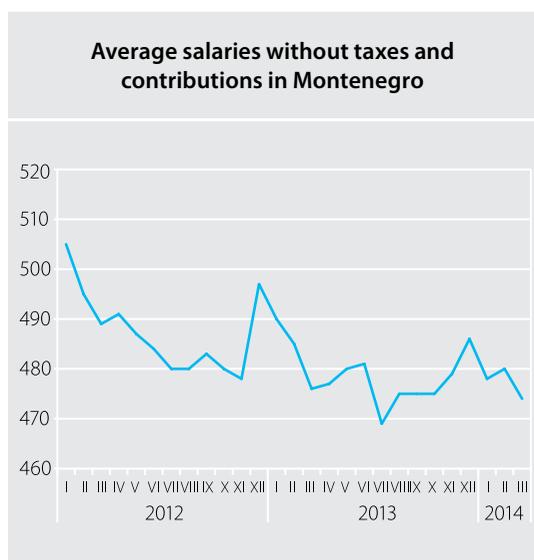
AD – aggregate demand, C – personal consumption, I – investment consumption, G – public consumption

3.1.1. Salaries and other available demand determinants

In the Q1 2014, the average salary in Montenegro amounted to 725 euros, while average salary without taxes and contributions amounted to 477 euros. Average salary and average salary without taxes and contributions recorded q-o-q decrease of 0.5% and 0.6%, respectively. In comparison with the same period of the previous year, average salary and average salary without taxes and contributions recorded decline of 0.5% and 1.4%, respectively.

Taking into account the consumer prices, i.e. salaries in real amounts, it can be concluded that real salaries recorded increase only in February, while they recorded decrease in January and March.

Graph 26



Source: Monstat

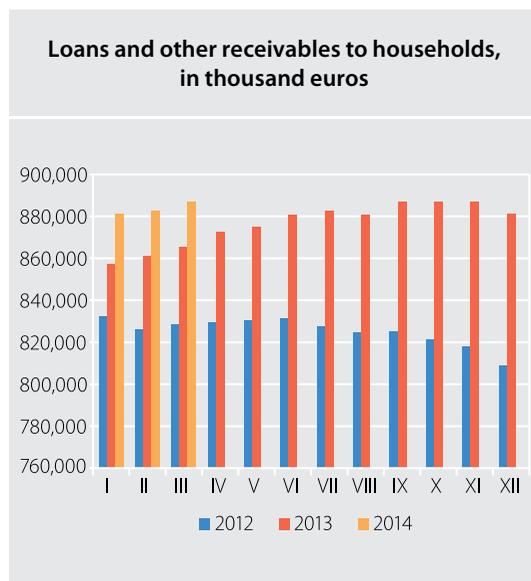
Graph 27



Source: Monstat

Lending to the household sector in Q1 2014 was marked by a positive trend. The average monthly loans to this sector grew at a rate of 0.2% (while in the same period of 2013 recorded an average growth rate of 2.3%). At end-Q1 2014, total loans to the household sector amounted to 887.1 million euros, which is 5.8 million euros or 0.7% more than at the end-2013 or 21.6 million euros (2.5%) more than in the same period of the previous year.

Graph 28

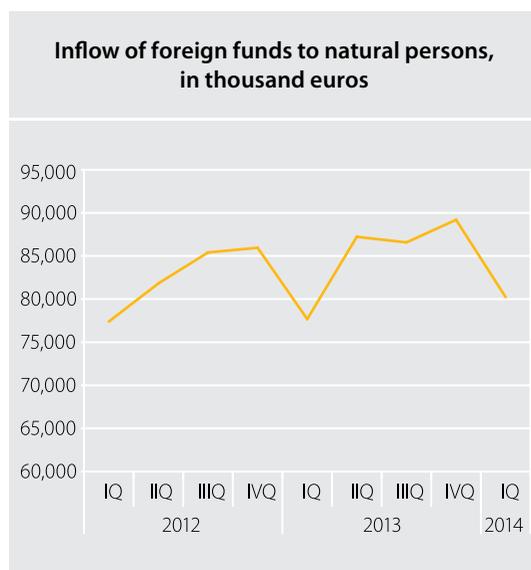


Per capita debt¹ amounted to 1.431 euros at end-March 2014 or 0.7% higher than at end-2013 or 2.5% higher than at the end of Q1 of the previous year.

Total MFIs loans disbursed to households amounted to 38.3 million euros at end-March 2014 which was 1.6 million euros or 4.4% more than at the end of the previous year, and 1.3 million euros or 3.2% lower than a year ago.

In Q1 2014, household deposits recorded mainly a growing trend (except in January), and recorded the average monthly increase of 0.05% (in the same period in 2013 there was an average monthly increase of 0.5%). Deposits in this sector amounted to 1,239.2 million euros at the end-Q1 2014 and were 1.7 million euros or 0.1% higher than at end-2013 and 74.2 million euros or 6.4% higher than in the same period of the previous year.

Graph 29



Loans to deposits ratio for this sector amounted to 0.72 at end-March 2014. It was at a higher level than in the previous year (0.71), or at a lower level than in the same period of the previous year (0.74). In Q1 2014, household sector recorded net deposits totalling 352.1 million euros, which was 4.1 million euros or 1.2% lower than at end-2013 or 52.6 million euros or 17.6% higher than in same period of the previous year.

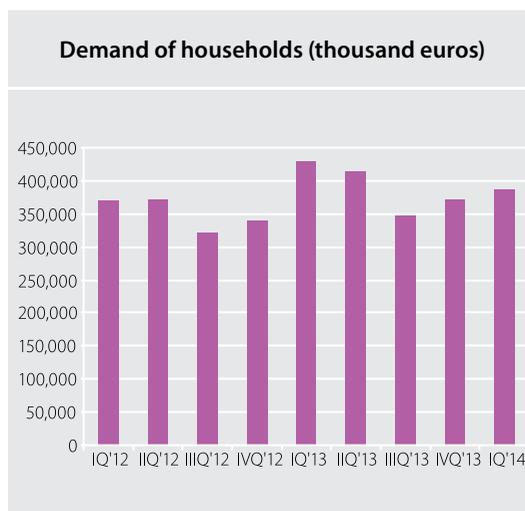
In Q1 2014, there was an increase in the inflow of remittances from abroad for the benefit of natural persons, as well as from inheritances, alimony and other gifts and grants, compared with the same period of the previous year.

Source: CBCG

¹ Data on population is taken from the Population Census 2011

Total demand of household sector by quarters showed increase in Q1 2014 relative to the previous quarter, but it was substantially lower than demand recorded in Q1 2013.

Graph 30



3.1.2. Budgetary analysis

Budget of Montenegro

According to the Ministry of Finance preliminary data, Montenegrin budget recorded total revenues² amounting to 332.8 million euros in the first three months of 2014.

Source revenues amounted to 253.6 million euros, or 7.2% of projected GDP³, and in relation to the plan they grew by 8.6%, while compared with the same period in 2013, budget revenues were 15.4% higher. In the structure of source revenues, the largest share of 64.8% was recorded by the revenues from taxes 29.6%, other revenues 2.1%, compensations 1.8%, fees 1.1%, donation 0.4% and receipts from loan repayments 0.2%.

Revenues from taxes amounted to 164.3 million euros, which represents an increase of 9.5% compared to the plan, while compared to the same period of the previous year they increased by 21.1%. Nominally, the highest increase in revenues compared to the same period of the previous year was recorded in the value added tax (19.2 million euros or 24.2%). This increase in VAT revenues is a result of the implementation of measures for shadow economy suppression.

Negative deviation in relation to the same period of the previous year was recorded in excise duties and international trade tax.

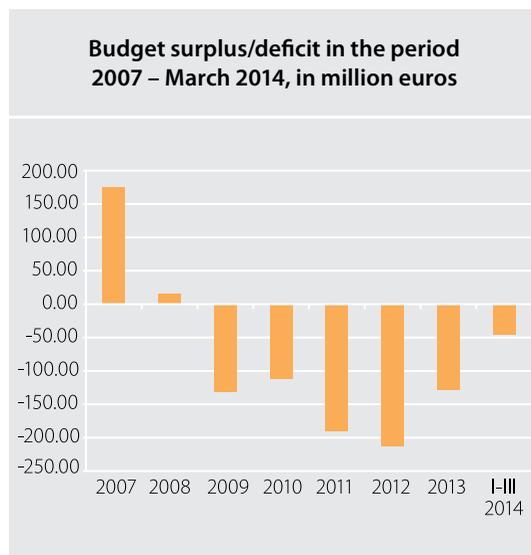
Revenues from contributions amounted to 75 million euros or 9.4% compared to the plan for Q1 2014, while compared to the same period of 2013 they increased 9.3%.

² Revenues include source revenues (direct and indirect taxes and non-tax revenues), borrowings, donations and revenues from privatization and sale of property.

³ Source: Ministry of Finance; Estimated GDP for 2014 amounts to 3.52 billion euros.

In Q1 2014, *budget expenditures* amounted to 299.1 million euros or 8.5% of GDP. Realized expenditures in relation to the plan for the first quarter of this year declined by 10.6% but increased in relation to Q1 2014 by 7.2% or 20.2 million euros, mainly due to paid guarantees in the amount of 9.7 million euros, and the capital expenditures which recorded an increase of 2 million euros. Compared to the previous year, expenditures for pensions increased due to an increase in the number of beneficiaries of pension insurance.

Graph 31



Source: Ministry of Finance

Current budget expenditures amounted to 290.5 million euros or 8.3% of GDP, while the capital budget amounted to 8.6 million euros or 0.2% of GDP.

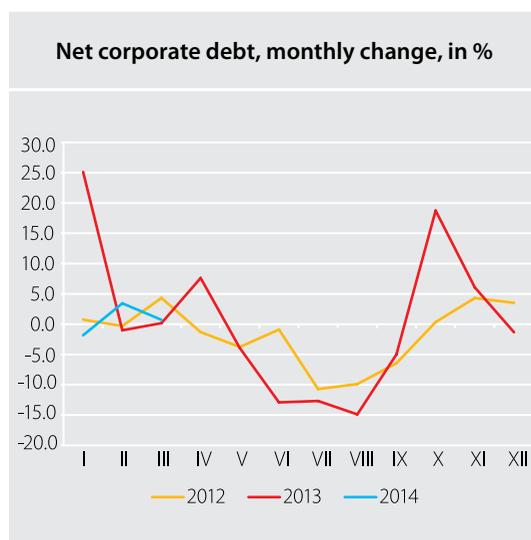
Current expenditures in the observed period amounted to 132.8 million euros and were lower by 15.1% than planned. Almost all current expenditures, excluding expenditures for subsidies were below planned.

Montenegrin budget deficit was estimated to 14.5 million euros or 1.3% of GDP.

3.1.3. Economy

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

Graph 32



During Q1 2014, loans to the corporate sector were significantly higher than the deposits of the sector. Thus, net debt of the corporate sector amounted to 404.9 million euros at the end of the observed period, and it was 9 million euros or 2.3% higher than at end-2013, when compared to Q1 2013 when it amounted to 96.2 million euros or 19.2% lower. At the end of the first quarter of 2014, the structure of loans in this sector was dominated by long-term loans with 67.6%, which indicates that corporate loans were predominantly used to increase the volume of economic activity.

3.1.4. External demand and the current account

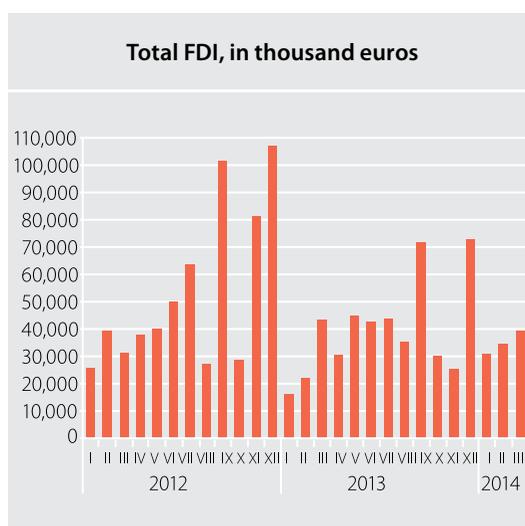
In Q1 2014 a decrease in the current account deficit was recorded, thus continuing the declining trend in the deficit from the previous year. According to preliminary data, the current account deficit amounted to 184 million euros or 4.7% less than in the same period of the previous year. During the reporting period, there was a decrease in the trade deficit (2.2%). In trade with foreign countries, there was a significant decrease in visible export by 17.2%, due to a decline in industrial production, especially in the production of metal products and basic metals, as well as the decline in production in the electricity sector.

Due to the growth in external demand in the international invisible trade in Q1 2014, a surplus amounting to 12.8 million euros was recorded, while the sub-accounts of primary and secondary income recorded surplus of 58 million euros, which is approximately the same as in 2013. The primary income account recorded a surplus of 31.3 million euros or 6.7% less than in the same period of 2013. Factor income revenues declined by 1% compared to the same period of the previous year, while at the same time, expenditures increased by 9.8% as a result of increased expenditures on compensation for employees and interest repayments. The secondary income account recorded an increase of transfers from abroad, resulting in a surplus in the amount of 26.8 million euros or 7.8% more than in same period in 2013.

In Q1 2014, according to preliminary data, the net inflow of FDI amounted to 78 million euros or 19% more than the same period of the previous year. Since the beginning of the year, there is an evident trend of inflows on a monthly level.

During the reporting period, the largest inflow was based on intercompany debt in the amount of 55.2 million euros or 52.7% of total FDI inflow. Equity investment recorded an inflow in the amount of 47.6 million euros or 45.4% of the total inflow. In the structure of equity investments, major part referred to the real estate's investment in the amount of 37.6 million euros, while investments in companies amounted to 9.9 million euros.

Graph 33

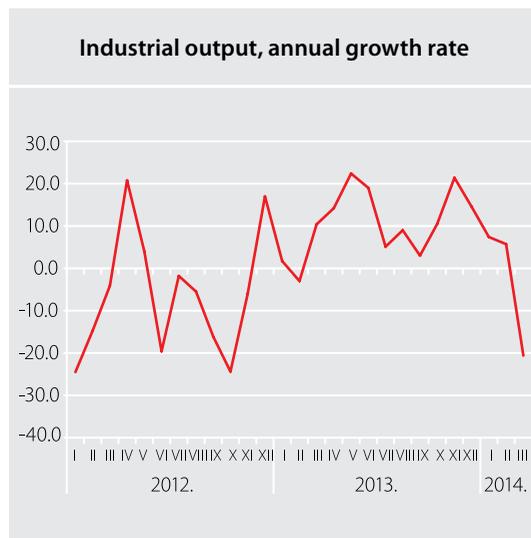


Source: CBCG

3.2. Supply and production

In Q1 2014, industrial production declined by 3.9% compared to the same period of the previous year, due to the decline recorded in the sector of electricity, gas and water supply by 24.3%. Production growth of 16.1% was recorded in mining and quarrying 25.2% in the manufacturing sector. Observing the monthly data on industrial output in Q1, the increase was recorded only in February (0.4%), while a decrease was recorded in March (6.5%). Monthly decline of 22.2% was recorded in January.

Graph 34



Source: Monstat

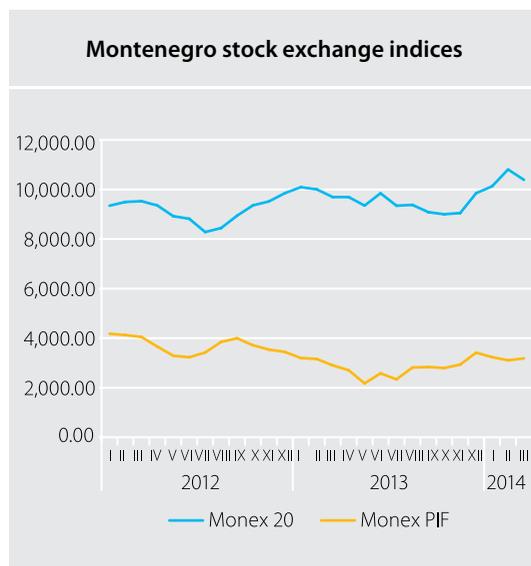
During Q1 2014, Montenegro was visited by 54,728 tourists, which represents an increase of 2.2% compared to the same period of 2013. Number of domestic and foreign tourists' arrivals grew by 0.5% and 2.7%, respectively. The number of overnights in the observed period amounted to 206.30, showing y-o-y increase of 8.2%.

The total production of wood products in the first three months of 2014 amounted to 19.381m³ of forest products, which is 86.2%⁴ more than in the same period of the previous year.

In Q1 2014, road passenger transportation and cargo transportation recorded respective y-o-y growth of 5.1%. Road passenger transportation⁵ increased 31.2%. Railway transportation increased in Q1 2014, and in relation to Q1 2011 it increased by 49.4%, while cargo transportation increased by 3.3%.

3.3. Stock exchange indices

Graph 35



Source: Montenegro stock exchange

In 2014, MONEX20 continued the positive trend from the end of the previous year. During the first two months, Monex20 recorded monthly increase, while in March it recorded a monthly decline, but the value was higher than the value at the end of the year. On the other hand, the investment funds' index, Monex PIF, continued negative trend in 2013, and during the first two months it declined, while in March recorded a slight increase.

At end-March 2014, Monex20 recorded an absolute increase of 537.84 index points or 5.5%, compared to the previous year, while Monex PIF declined by 230.92 index points or 6.8 %.

Compared to end-March 2013, Monex 20 grew by 7.2%, while Monex PIF recorded a growth of 9.6%.

⁴ Expressed by weighted index, while according to non-weighted index the growth was 79.8%.

⁵ Due to the change in methodology, as of Q1 2014, road cargo transportation is calculated on the basis of a new survey which is quite different than the former. Thus, this change affected the the break in the time serie. For more details, see Monstat's statement No. 153 as of 29 May 2014.

With regard to their historical maximum values (reached in 2007), Monex 20 and Monex PIF declined by 4.7 times and 16 times, respectively, at end-March 2014.

Table 3

General data on indices				
	MONEX 20		MONEX PIF	
Value on 31 March 2014	10,388.02		3,181.32	
Absolute change of index in 2014	537.84		-230.92	
Initial index value	1000.00	March 2003	1000.00	March 2003
Maximum value in 2014	10,802.05	28.02.2014.	3,443.25	15.01.2014.
Maximum historical value	48,617.88	07.05.2007.	50,780.54	17.08.2007
Minimum historical value	918.57	14.04.2003	959.53	02.04.2003
Growth (decline) in 2014	5.5%		-6.8%	

Source: Montenegro stock exchange

4. MONETARY POLICY

In Q1 2014, there were neither change in existing, nor new decisions were passed referring to the CBCG monetary policy instruments.

5. INFLATION FORECAST FOR 2014 AND Q1 2015

5.1. Model assessment

Montenegro's inflation fan chart represents a graph of probability distribution of inflation rate presented by the consumer price index (CPI). Focusing on this, 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 inflation movement. 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 and the like).

Montenegro's fan chart for 2014 and Q1 2015 was based on the following three estimated components:

1. **Central projection values** – were derived from ARIMA model and use Tramo/Seats simulation for the purpose of obtaining more efficient model.
2. **Degree of uncertainty** – determines the fan chart width. The degree of uncertainty ratio is obtained through analytical assessment and calculation of a relative impact of potential internal and external shocks which are possible in Montenegrin economy during 2014, and which are read through “thickness” of the band around 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 “overestimated” or “underestimated” the inflation rates. This will also influence the position of the mean value of inflation distribution.

Fan Chart central projection - ARIMA model for 2014 and Q1 2015

With a view to developing a fan chart, an ARIMA model of time series of inflation in Montenegro (Autoregressive Integrated Moving Average) was developed and showed through the Consumer Price Index⁶.

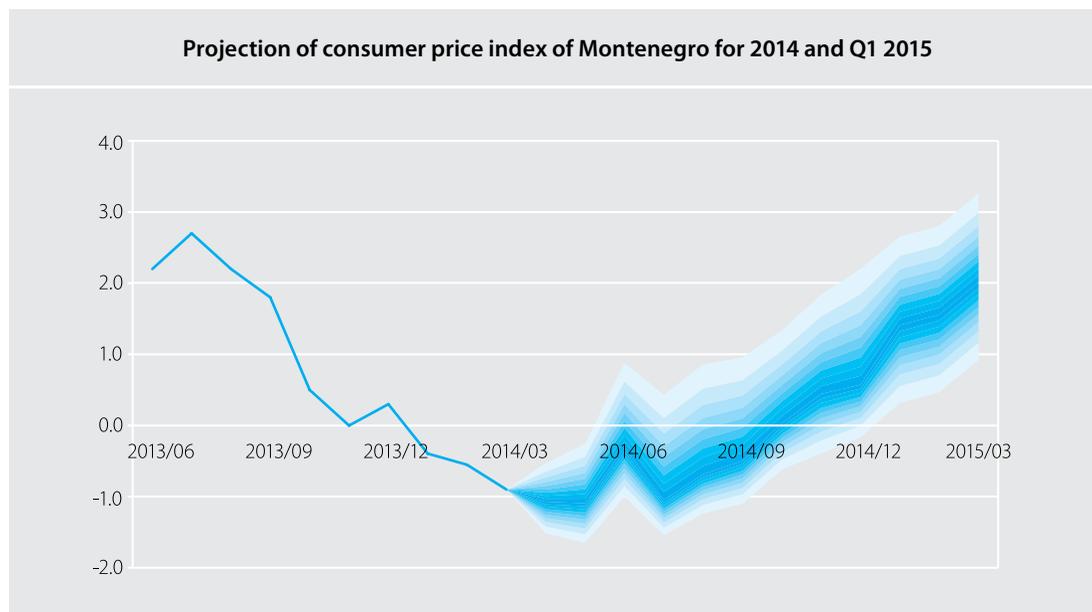
⁶ A detailed explanation of the ARIMA model of Montenegro is given in the working study of the Central Bank of Montenegro No. 11 „Inflation Forecast: Empirical Research of Retail Price Index Movements in Montenegro in 2007 –Application of ARIMA Model“.

ARIMA model was used for short term forecasts (12 months), whereby iteration of several ARIMA models was made, which were ranked based on their efficiency and quality of diagnostics. The selected ARIMA model, ARIMA (21,1,16)⁷ has sufficient confidence level for forecasts.

The monthly forecasts value was used as the value of central projection of the Fan Chart of CPI for 2014 and Q1 2015. 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 was 1.9, while skewedness varied from 0,5 to 1,4, and standard deviation value was 0,3. Similar to the projection from the previous quarter, central band was placed in lower part of distribution, i.e. the corresponding degree of uncertainty was concentrated towards higher inflation levels, which is reflected in the graph through “thicker” band concentrated above central “the deepest shade of red” band although being substantially moderate in comparison to the previous period. 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.⁸ 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



Source: CBCG, 2014.

⁷ 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.

⁸ The mode value (central projection) is, by construction, always in the deepest band shade, but in the 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 showing the inflation in Montenegro based on an ARIMA model assessment for 2014 and Q1 2015 shows with 90% probability that the *inflation, measured by CPI depending on month, will range between -1.65% and 3.26%*. It is forecasted that the inflation will range from -0.17% to 2.2% at end-2014. Namely, the increase of time horizon for projection increases the uncertainty, which consequently spreads their range of forecast.

The following basic assumptions have been taken into account when forecasting the inflation in 2014 and Q1 2015:

1. Seasonal fluctuations of agricultural products up to 7%. The assumption involves a potential price increase of food products from neighbouring countries that are faced with climate disasters;
2. Considering the geopolitical tensions we assumed the increase in the prices of oil and petroleum products by 5%;
3. Growth in electricity prices by 5% (potential growth in August 2014 is not incorporated);
4. Real wages in 2014 will be the same as in 2013;
5. Stagnation and minor decline in real estate prices;
6. VAT growth or other tax liabilities are not assumed.

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

6. EXPECTED INFLATION IN 2014

Level of the aggregate demand in Q1 2014 has declined compared to the previous quarter and relative to Q1 2013. Therefore, demand in the next period should not suffer inflationary pressures. On the other hand, the level of economic activity is on the rise. Also, our survey shows that in the future we may expect a slight increase in economic activity. Although negative effects of the Ukrainian crisis and flooding in the region are not expected, our expectation is that we will definitely have a positive economic growth rate, which will also have deflation effect.

At the moment, there are no pressures from the international market, given the low rate of inflation, both in the region and the EU. Oil prices in the first quarter were in decline, and the pressure did not come either from the food prices side from the international market. Bearing in mind that the flooding in the region had the most negative effects in the agriculture, there is a small risk that such developments may impact on the prices of agricultural and food products from the region, which have a significant share in the Montenegrin import.

Market indicator has a negative value, which clearly suggests that inflation expectations are declining. Inflation remains negative, but with a slight tendency to its approaching zero value. Therefore, we decided not to change our expert estimation of inflation and we expect inflation to the end of the year to be in the range of 0% to 3%. Please note that this is an asymmetric projection that gives higher probability to lower inflation rates.

Table 4

Estimated inflation rate		
Optimistic assessment	Realistic assessment	Pessimistic assessment
0%	1%	3%

This assessment is based on the same assumptions for the econometric forecast. Change of some of these assumptions would require the revision of the entire projection.