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MODEL CALCULATIONS OF SHORT-TERM FORECASTS OF RUSSIAN ECONOMIC TIME SERIES

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INTRODUCTION TO ALL THE ISSUES

This paper presents calculations of various economic indicators for the Russian Federation in the period from March to August 2016, which were performed using time series models developed as a result of research conducted by the Gaidar Institute over the past few years[1]. A method of forecasting falls within the group of *formal* or *statistical* methods. In other words, the calculated values neither express the *opinion* nor *expert evaluation* of the researcher, rather they are calculations of future values for a specific economic indicator, which were performed using formal ARIMA-models (*p*, *d*, *q*) given a prevailing trend and its, in some cases, significant changes. The presented forecasts are of inertial nature, because respective models rely upon the dynamics of the data registered prior to the moment of forecasting and depend too heavily on the trends, which are typical of the time series in the period immediately preceding the time horizon to be forecast. The foregoing calculations of future values of economic indicators for the Russian Federation can be used in making decisions on economic policy, provided that the general trends, which were seen prior to forecasting for each specific indicator, remain the same, i.e. prevailing long-term trends will see no serious shocks or changes in the future.

Despite that there is a great deal of data available on the period preceding the crisis of 1998, models of forecasting were analyzed and constructed using only the time horizon which followed August 1998. This can be explained by the findings of previous studies[2] which concluded, among other key inferences, that the quality of forecasts was deteriorated in most of the cases when the data on the pre-crisis period was used. Additionally, it currently seems incorrect to use even shorter series (following the crisis of 2008), because statistical characteristics of models based on such a short time horizon are very poor.

Models for the economic indicators in question were evaluated using standard methods of time series analysis. Initially, the correlograms of the studied series and their first differences were analyzed in order to determine the maximum number of delayed values to be included into the specifications of a model. Then, the results of analyzed correlograms served as the basis for testing all the series for weak stationarity (or stationarity around the trend) using the Dickey–Fuller test. In some cases, the series were tested for stationarity around the segmented trend using Perron and Zivot–Andrews tests for endogenous structural changes.[3]

The series were broken down into weak stationary, stationary near the trend, stationary near the trend with structural change or difference stationary, and then models, which corresponded to each type (regarding the levels and including, if necessary, the trend or segmented trend or differences), were evaluated. The Akaike and Schwartz information criteria, the properties of models' residuals (lack of autocorrelation, homoscedasticity and normality) and the quality of the in-sample-forecasts based on these models were used to choose the best model. Forecast values were calculated for the best of the models constructed for each economic indicator.

Additionally, the Bulletin presents future monthly values of the CPI, which were calculated using models developed at the Gaidar Institute, and volumes of imports/exports from/to all countries, which were calculated using structural models (SM). The forecast values based on the structural models may, in some cases, produce better results than ARIMA-models do, because structural models are constructed by adding information of the dynamics of exogenous variables. Besides, the

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1 See, for example, R.M. Entov, S.M. Drobyshevsky, V.P. Nosko, A.D. Yudin. *The Econometric Analysis of the Time Series of the Main Macroeconomic Indices.* Moscow, IET, 2001; R.M. Entov, V.P. Nosko, A.D. Yudin, P.A. Kadochnikov, S.S. Ponomarenko. *Problems of Forecasting of Some Macroeconomic Indices.* Moscow, IET, 2002; V. Nosko, A. Buzaev, P. Kadochnikov, S. Ponomarenko. *Analysis of the Forecasting Parameters of Structural Models and Models with the Outputs of the Polls of Industries.* Moscow, IET, 2003; M.Yu. Turuntseva and T.R. Kiblitskaya, *Qualitative Properties of Different Approaches to Forecasting of Social and Economic Indices of the Russian Federation.* Moscow, IET, 2010.

2 Ibid.

3 See.: Perron, P. Further Evidence on Breaking Trend Functions in Macroeconomic Variables, *Journal of Econometrics,* 1997, 80, pp. 355–385; Zivot, E. and D.W.K. Andrews. Further Evidence on the Great Crash, the Oil-Price Shock, and Unit-Root Hypothesis. *Journal of Business and Economic Statistics,* 1992, 10, pp. 251–270.

use of structural forecasts in making aggregated forecasts (i.e. forecasts obtained as average value from several models) may help make forecast values more accurate.

The dynamics of the Consumer Price Index was modeled using theoretical assumptions arising from the monetary theory. The following was used as explanatory variables: money supply, output volume, the dynamics of the ruble-dollar exchange rate which reflects the dynamics of alternative cost of money-keeping. The model for the Consumer Price Index also included the price index in the electric power industry, because the dynamics of manufacturers' costs relies heavily on this indicator.

The baseline indicator to be noted is the real exchange rate, which can influence the value of exports and imports, and its fluctuations can result in changes to the relative value of domestically-produced and imported goods, though the influence of this indicator turns out to be insignificant in econometric models. Global prices of exported resources, particularly crude oil prices, are most significant factors, which determine the dynamics of exports: a higher price leads to greater exports of goods. The level of personal income in the economy (labor costs) was used to describe the relative competitive power of Russian goods. Fictitious variables D12 and D01 – equal to one in December and January and zero in other periods – were added so that seasonal fluctuations were factored in. The dynamics of imports is effected by personal and corporate incomes whose increase triggers higher demand for all goods including imported ones. The real disposable money income reflects the personal income; the Industrial Production Index reflects the corporate income.

The forecast values of foreign exchange rates were also calculated using structural models of their dependence on global crude oil prices.

The forecast values of explanatory variables, which are required for forecasting on the basis of structural models, were calculated using ARIMA-models (p, d, q).

The paper also presents calculations of the values of the Industrial Production Index, the Producer Price Index and the Total Unemployment Index, which were calculated using the results of business surveys conducted by the Gaidar Institute. Empirical studies show[1] that the use of series of business surveys as explanatory variables[2] in forecasting models can make forecasting more accurate on the average. Future values of these indicators were calculated using ADL-models (seasonal autoregressive delays were added).

The Consumer Price Index and the Producer Price Index are also forecast using large datasets (factor models – FM). The construction of factor models relies basically on the evaluation of the principal components of a large dataset of socio-economic indicators (112 indicators in this case). The lags of these principal components and the lags of the explanatory variable are used as explanatory variables in these models. A quality analysis of the forecasts obtained for different configurations of the factor models was used to chose a model for the CPI, which included 9th, 12th and 13th lags of the four principal components, as well as 1st and 12th lags of the variable itself, and a model for the PPI, which included 8th, 9th and 12th lags of the four principal components, as well as 1st, 3rd and 12th lags of the variable itself.

All calculations were performed using the Eviews econometric package.

1 See, for example: V. Nosko, A. Buzaev, P. Kadochnikov, S. Ponomarenko. *The Analysis of Forecasting Parameters of Structural Models and Models with Business Surveys' Findings.* Moscow, IEP, 2003.
2 Used as explanatory variables were the following series of the business surveys: the current/expected change in production, the expected changes in the solvent demand, the current/expected price changes and the expected change in employment.

CALCULATIONS OF FORECAST VALUES OF INDICES OF INDUSTRIAL PRODUCTION[1], (%)

Table 1

| | Index of industrial production | | | | IIP for mining | | IIP for manufacturing | | IIP for utilities (electricity, water, and gas) | | IIP for food products | | IIP for coke and petroleum | | IIP for primary metals and fabricated metal products | | IIP for machinery | |
| | Rosstat | | NRU HSE | | | | | | | | | | | | | | | |
	ARIMA	BS	ARIMA	BS	Rosstat	NRU HSE	Rosstat	NRU HSE	Rosstat	NRU HSE	Rosstat	NRU HSE	Rosstat	NRU HSE	Rosstat	NRU HSE	Rosstat	NRU HSE
Expected growth on the respective month of the previous year																		
March 2016	-1.0	-2.3	-1.0	-1.0	2.7	0.8	0.2	0.5	-3.6	2.5	3.1	2.0	1.0	-2.7	-3.2	-2.7	-3.8	-2.5
April 2016	-0.3	-2.5	-0.3	-2.1	2.3	1.5	2.8	1.0	-3.9	-2.6	3.2	2.6	-1.2	-4.7	-3.6	-0.6	4.5	-0.4
May 2016	0.7	-2.4	0.7	-0.9	2.1	1.2	4.2	2.0	2.0	2.3	3.0	3.2	-1.9	-4.9	-2.8	0.8	11.6	11.0
June 2016	0.8	-3.1	0.2	-1.5	1.6	1.5	1.4	1.4	1.2	0.7	2.6	2.4	1.0	-1.8	-2.5	-2.0	22.4	5.6
July 2016	-0.1	-3.7	-0.1	-2.4	0.7	1.5	0.4	1.3	0.3	0.0	2.5	2.6	1.1	-1.3	-4.6	-4.5	9.4	0.9
August 2016	0.6	-1.7	0.6	-0.1	0.0	1.4	1.6	2.1	0.9	2.0	2.4	2.5	0.1	-2.7	-4.8	-4.6	3.8	3.6
For reference: actual growth in 2015 on the respective month of 2014																		
March 2015		-0.6		-1.8	0.4	1.1	-1.9	-3.9	0.8	-0.1	2.3	1.2	0.9	-1.5	-6.6	-0.9	-4.3	-13.0
April 2015		-4.5		-3.5	-0.8	-0.1	-7.2	-6.5	1.8	0.5	-0.6	-0.7	1.8	1.1	-9.3	-2.3	-14.9	-22.5
May 2015		-5.5		-4.1	-0.9	0.7	-8.3	-7.3	-1.4	-1.9	-1.5	-1.3	-0.7	-1.4	-11.2	-6.0	-24.9	-29.2
June 2015		-4.8		-2.7	-0.9	0.5	-6.6	-5.0	-1.0	-0.1	3.9	3.0	-2.8	-3.6	-6.3	-5.0	-21.6	-21.2
July 2015		-4.7		-1.9	0.2	1.4	-7.1	-4.3	-0.8	1.4	2.7	1.1	3.1	1.0	-6.7	-2.2	-11.1	-15.0
August 2015		-4.3		-1.5	0.8	1.1	-6.8	-3.3	-0.7	0.3	0.4	0.5	1.4	0.0	-6.1	-1.1	-14.7	-8.9

Note. In the time spans under review, the series of the Rosstat and the NRU HSE chain indices of IIP, as well as the NRU HSE chain IIP for manufacturing are identified as stationary processes around the trend with an endogenous structural change; the series of the Rosstat and the NRU HSE chain IIPs for manufacturing, for primary metals and fabricated metal products, as well as the NRU HSE chain IIP for mining and Rosstat chain IIP for machinery and equipment are identified as stationary processes around the trend with two endogenous structural changes. The time series of other chain indices are stationary at levels.

1 It is to be noted that for making of forecasts so-called "raw" indices (without seasonal and calendar adjustment) were used and for that reason in most models existence of the season factor is taken into account and, as a consequence, the obtained outputs reflect the seasonal dynamics of the series.

INDUSTRIAL PRODUCTION AND RETAIL SALES

Industrial production

For making forecast for spring and summer of 2016, the series of monthly data of the indices of industrial production released by the Federal State Statistics Service (Rosstat) from January 2002 to December 2015, as well as the series of the base indices of industrial production released by the National Research University Higher School of Economics (NRU HSE[1]) over the period from January 1999 to January 2016 were used (the value of January 2000 was equal to 100%). The forecast values of the series were calculated on the basis of ARIMA-class models. The forecast values of the Rosstat and the NRU HSE indices of industrial production are calculated using business surveys (BS) as well. The obtained results are shown in Table 1.

As seen from *Table 1*, the average[2] the decrease of the industrial production index computed by NRU HSE in March–August 2016 against the same period of the previous year amounts to 0.7% on industry as a whole. The average monthly decline of the industrial production index computed by Rosstat as forecast at the level of 1.3%.

The average monthly values of the industrial production index for mining and quarrying computed by Rosstat and NRU HSE will come to 1.6% and 1.3%, respectively in March–August 2016. In production of coke and petroleum products, Rosstat and NRU HSE forecast average growth at 0.0% and (-3.%), respectively.

In March–August 2016 in comparison with the same period of last year, the average growth of the NRU HSE industrial production index is forecast at 1.4%, and the Rosstat index at 1.8%. The average monthly values of the Rosstat and NRU HSE industrial production index for production of food products constitute 2.8% and 2.6%, respectively. The average monthly values of the industrial production index for basic metals and fabricated metal products in March–August 2016 computed by Rosstat and NRU HSE constitute (-3.6%) and (-2.3%), respectively. In manufacture of machines and equipment average increase is forecast at 8.0% and 3.0% for the Rosstat and NRU HSE indices, respectively.

The industrial production index for electricity, gas and water supply computed by Rosstat averages (-0.5%) for March–August 2016 compared to the same period last year, the same indicator for NRU HSE index comes to 0.8%.

Retail Sales

This section (Table 2) presents forecasts of monthly retail sales made on the basis of monthly Rosstat data over January 1999 – January 2015.

As seen from *Table 2*, the average forecast increment of the monthly trade turnover in nominal terms amounts to around 3.2% for March–August 2016 against the corresponding period of 2015.

The average forecast decline of monthly real turnover will constitute 12.2% for the period from March 2016 to August 2016 against the corresponding period of 2015.

Table 2

CALCULATIONS OF FORECAST VALUES OF THE RETAIL SALES AND THE REAL RETAIL SALES

Forecast value according to ARIMA-model		
	Retail sales, billion Rb (in brackets – growth on the respective month of the previous year, %)	Real retail sales (as % of the respective period of the previous year)
Mar 16	2254.0 (2.1)	87.6
Apr 16	2228.6 (2.9)	88.4
May 16	2295.8 (3.0)	88.1
Jun 16	2316.9 (3.6)	87.6
Jul 16	2400.2 (3.8)	87.7
Aug 16	2480.5 (3.9)	87.6
For reference: actual values in the same months of 2014		
Mar 15	2206.8	91.5
Apr 15	2166.5	90.4
May 15	2228.3	91.1
Jun 15	2235.4	90.8
Jul 15	2312.7	90.8
Aug 15	2387.0	90.8

Note. The series of retail sales and real retail sales over January 1999 – January 2016.

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1 The indices in question are calculated by E.A. Baranov and Vladimir Bessonov.
2 The average growth of industrial production indices is understood here as the average value of the said indices for six forecast months.

INVESTMENTS IN CAPITAL ASSETS

Table 3 presents the outputs of calculations of forecast values of investment in capital assets in March–August 2016. The forecasts were made on the basis of time-series models using the data released by Rosstat over January 1999 – January 2016.

Results presented in *Table 3* show the average forecast decrease of the specified rate of investment in fixed capital will constitute around 2.0% in March–August 2016 against the corresponding period of 2015.

The average forecast fall of real investment over the period from March to August 2016 compared to the corresponding period of 2015 comes to 6.7%.

FOREIGN TRADE INDICES

Model calculations of forecast values of the export and export to countries outside the CIS and the import and import from countries outside the CIS were made on the basis of the models of time series and structural models evaluated on the basis of the monthly data over the period from September 1998 to January 2016 on the basis of the data released by the Central Bank of Russia[1]. The results of calculations are shown in Table 4.

The forecast average fall of export, import, export outside CIS and imports from the countries outside CIS for summer – autumn 2016 against the same period of 2015 will amount to 10.8%, 11.5%, 11.9% and 12.1%, respectively. The forecast average surplus volume of the trade balance with all countries for March–August 2016 will constitute $70.8bn, which corresponds to a contraction of 9.8% on the same period of 2015.

DYNAMICS OF PRICES

The Consumer Price Index and Producer Price Index
This section presents calculations of forecast values of the consumer price index and producer price index (as regards both the industry in general and some types of its activities under the National Industry Classification Standard (NICS)) made on the basis of the time-series models evaluated on the basis of the data released by Rosstat over the period from January 1999 to December 2015[2]. Table 5 presents the results of model calculations of forecast values over March and August 2016 in accordance with ARIMA-models, structural models (SM) and models computed with the help of business surveys (BS).

Table 3

CALCULATIONS OF FORECAST VALUES
OF INVESTMENTS IN CAPITAL ASSETS
AND REAL INVESTMENTS IN CAPITAL ASSETS

Forecast values according to ARIMA-model		
	Investments in capital assets, billion Rb (in brackets – growth on the respective month of the previous year, %)	Real investments in capital assets (as % of the respective period of the previous year)
Mar 16	733.2 (-5.0)	93.5
Apr 16	779.7 (-4.1)	93.9
May 16	989.0 (-1.5)	93.2
Jun 16	1208.9 (0.4)	93.1
Jul 16	1063.8 (-1.4)	93.0
Aug 16	1205.9 (-0.3)	93.4
For reference: actual values in the same months of 2015		
Mar 15	772.1	95.4
Apr 15	812.8	93.8
May 15	1004.2	90.1
Jun 15	1203.8	90.4
Jul 15	1078.4	88.3
Aug 15	1209.1	86.6

Note. The series of investments in capital assets over the period from January 1999 to January 2016 are series of DS type.

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1 The data on the foreign trade turnover is calculated by the CBR in accordance with the methods for making of the balance of payment in prices of the exporter-country (FOB) in billion USD.
2 Structural models were evaluated in the period from October 1998.

Table 4

CALCULATIONS OF FORECAST VALUES OF VOLUMES OF FOREIGN TRADE TURNOVER WITH COUNTRIES OUTSIDE THE CIS

Month	Export to all countries				Import from all countries				Export to countries outside the CIS				Import from countries outside the CIS			
	Forecast values (billion USD a month)		Percentage of actual data in the respective month of the previous year		Forecast values (billion USD a month)		Percentage of actual data in the respective month of the previous year		Forecast values (billion USD a month)		Percentage of actual data in the respective month of the previous year		Forecast values (billion USD a month)		Percentage of actual data in the respective month of the previous year	
	ARIMA	SM	ARIMA	SM	ARIMA	SM	ARIMA	SM	ARIMA	SM	ARIMA	SM	ARIMA	SM	ARIMA	SM
March 2016	26.6	27.4	81	84	14.0	13.4	91	86	24.4	21.3	86	75	12.1	11.6	79	76
April 2016	26.2	24.0	86	78	15.1	14.7	88	86	23.7	18.7	90	71	13.5	12.3	96	87
May 2016	25.8	25.8	84	84	13.4	12.4	82	76	24.7	21.8	93	82	13.2	10.9	100	82
June 2016	28.9	24.9	96	83	14.9	13.0	97	84	20.6	19.3	80	75	11.9	11.4	85	81
July 2016	26.4	25.6	97	94	17.5	13.8	107	85	24.2	22.5	104	96	14.7	12.3	100	84
August 2016	25.8	26.7	103	107	16.3	14.0	97	83	23.4	22.8	110	107	14.1	12.6	98	88
For reference: actual values in respective months of 2015 (billion USD)																
March 2015	32.7				17.2				28.4				15.3			
April 2015	30.6				16.3				26.2				14.2			
May 2015	30.6				15.4				26.6				13.2			
June 2015	30.0				16.3				25.9				14.0			
July 2015	27.2				16.9				23.4				14.6			
August 2015	25.0				16.4				21.3				14.3			

Note. Over the period from January 1999 to January 2016, the series of export, import, export to the countries outside the CIS and import from the countries outside the CIS were identified as stationary series in the first-order differences. In all the cases, seasonal components were included in the specification of the models.

Table 5

CALCULATIONS OF FORECAST VALUES OF PRICE INDICES

Month	The consumer price index (ARIMA)	The consumer price index (SM)	The consumer price index (FM)	Producer price indices: for industrial goods (ARIMA)	for industrial goods (BS)	for industrial goods (FM)	for mining and quarrying	for manufacturing	for utilities (electricity, water, and gas)	for food products	for textile and sewing industry	for wood products	for pulp and paper industry	for coke and refined petroleum	for chemical industry	for basic metals and fabricated metal	for machinery and equipment	for transport equipment manufacturing
Forecast values (% of the previous month)																		
March 2016	100.6	100.6	101.1	101.5	101.5	102.2	100.0	101.3	98.9	100.0	100.5	101.0	100.6	102.2	101.7	101.0	100.6	100.6
April 2016	100.7	100.5	101.1	100.7	100.7	101.8	102.8	100.9	100.0	100.2	100.6	101.2	100.7	105.3	101.3	100.3	100.4	100.5
May 2016	100.8	100.5	101.0	100.3	101.1	101.5	98.0	100.6	99.7	100.4	100.8	100.7	100.6	102.1	100.6	100.5	100.8	100.9
June 2016	100.9	100.4	100.6	100.7	100.5	100.5	101.0	100.2	99.2	100.7	100.5	100.8	100.6	102.2	100.3	99.7	100.9	100.5
July 2016	100.8	100.3	100.7	100.9	100.7	100.6	97.9	100.5	100.3	101.0	100.6	100.4	100.5	102.1	100.2	100.1	100.4	100.3
August 2016	100.5	100.4	100.5	100.2	100.1	101.7	97.2	100.5	101.9	100.9	100.5	100.0	100.6	101.9	100.8	100.4	100.7	100.6
Forecast values (% of December 2015)																		
March 2016	102.7	102.2	104.6	102.4	100.6	104.0	100.3	103.6	102.3	100.8	101.5	101.7	102.3	104.7	102.9	102.7	103.0	101.1
April 2016	103.4	102.7	105.7	103.2	101.3	105.9	103.1	104.5	102.4	101.0	102.2	102.9	103.1	110.2	104.2	102.9	103.4	101.6
May 2016	104.3	103.2	106.8	103.5	102.4	107.5	101.0	105.1	102.1	101.5	103.0	103.6	103.7	112.5	104.9	103.5	104.2	102.5
June 2016	105.2	103.7	107.4	104.2	102.9	108.0	102.1	105.3	101.3	102.2	103.5	104.4	104.3	115.0	105.2	103.1	105.1	103.0
July 2016	106.0	104.0	108.2	105.1	103.6	108.7	100.0	105.7	101.6	103.2	104.1	104.9	104.9	117.4	105.4	103.2	105.6	103.3
August 2016	106.6	104.4	108.7	105.3	103.7	110.5	97.2	106.3	103.5	104.2	104.6	104.8	105.5	119.7	106.2	103.6	106.3	104.0
For reference: actual values in the same periods of 2015 (% of December 2014)																		
March 2015		107.5			109.1		114.7	109.2	101.3	109.0	108.5	107.4	109.3	107.2	110.7	118.9	105.9	105.0
April 2015		108.0			112.1		127.0	109.9	101.2	109.4	109.4	108.6	111.2	110.4	111.3	116.8	106.7	106.1
May 2015		108.4			110.7		121.6	109.7	100.2	109.5	109.3	108.9	112.3	110.8	111.9	114.0	106.4	106.7
June 2015		108.6			111.5		126.4	109.9	97.5	109.3	109.7	108.4	113.3	113.8	111.1	110.3	107.1	109.3
July 2015		109.5			113.2		125.2	111.7	102.8	110.0	110.0	108.2	113.9	117.6	113.1	111.6	109.3	113.2
August 2015		110.0			113.3		121.4	112.2	106.6	109.9	111.3	108.5	114.9	116.3	115.9	112.9	110.3	115.1

Note. Over the period from January 1999 to December 2015, the series of the chain producer price index for machinery are identified as a stationary process around the trend with two endogenous structural changes. The series of other chain price indices are stationary at levels.

The forecast average monthly growth of the consumer price index in March–August 2016 will come to 0.7%. The price growth of the industrial goods manufacturers for this period is forecast at an average monthly rate of 1.0%.

For the producer price indices computed by Rosstat for March–August 2016, the following average monthly growth rates are projected: in mining and quarrying (-0.5%), manufacturing 0.7%, electricity, gas and water production and supply 0.0%, manufacture of food products 0.5%, manufacture of textiles and textile products 0.6%, manufacture of wood and wood products 0.7%, manufacture of pulp, paper and paper products 0.6%, manufacture of coke and refined petroleum products 2.6%, manufacture of chemical products 0.8%, manufacture of basic metals. and fabricated metal products 0.3%, manufacture of machines and equipment 0.6% and manufacture of means of transport and transport equipment 0.6%.

**The Cost of the Monthly
per Capita Minimum Food Basket**

This section presents calculations of forecast values of the cost of the monthly per capita minimum food basket over March–August 2016. The forecasts were made based on time series with use the Rosstat data over the period from January 2000 to December 2015. The results are shown in Table 6.

As can be seen from *Table 6*, cost growth of the minimum set of food products is forecast compared with the corresponding period of the previous year. Herewith, forecast cost of the minimum set of food products constitutes around Rb 3,857.6. The forecast cost growth of the minimum set of food products will average around 2.8% compared to the level of the corresponding period of the previous year.

Indices of Freight Rates

This section presents calculations of forecast values of freight rate indices on cargo carriage[1], made on the basis of time-series models evaluated on the Rosstat data over the period from September 1998 to December 2015. Table 7 shows the results of model calculations of forecast values in spring and summer of 2016. It should be noted that some of the indices under review (for instance, the pipeline rate index) are adjustable ones and for that reason their behavior is hard to describe by means of the time-series models. As a result, the future values may differ greatly from the real ones in case of the centralized increase of rates in the period of forecasting or in case of absence of such an increase in the forecasting period, but with it taking place shortly before the beginning of that period.

Table 6

THE FORECAST OF THE COST OF THE MONTHLY PER CAPITA MINIMUM FOOD BASKET

Forecast values according to ARIMA-model (Rb)	
March 2016	3877.5
April 2016	3909.6
May 2016	3915.8
June 2016	3871.5
July 2016	3818.9
August 2016	3752.7
For reference: actual values in the same months of 2015 (billion Rb)	
March 2015	3774.3
April 2015	3785.7
May 2015	3824.3
June 2015	3792.7
July 2015	3765.8
August 2015	3583.9
Expected growth on the respective month of the previous year (%)	
March 2016	2.7
April 2016	3.3
May 2016	2.4
June 2016	2.1
July 2016	1.4
August 2016	4.7

Note. The series of the cost of the monthly per capita minimum food basket over the period from January 2000 to December 2015 are stationary in the first-order differences.

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1   The paper presents a review of the composite freight rate index on freight transport and the truckload freight rate index, as well as the pipeline rate index. The composite freight rate index is computed on the basis of the freight rate indices by individual types of transport: rail, pipeline, shipping, domestic water-borne, and truckload freight and air service (for more detailed information, pls. refer, for instance, to: *Prices in Russia*. The Official Publication of Goskomstat of RF, 1998).

According to the forecast results for March-August 2016, in the intervening 6 months, the composite freight rate index will be growing at an average monthly rate of 1.0%. In April 2016 and in July 2016, seasonal growth of the composite freight rate index is expected by 3.6 p.p.

The truckload freight rate index will be growing by a monthly average rate of 0.3% in the course of given six months.

The forecast monthly growth of the pipeline rate index averages 1.8%. In April 2016, seasonal growth of this index by 3.4 p.p. is expected.

Table 7

CALCULATIONS OF FORECAST VALUES OF INDICES OF FREIGHT RATES

Period	The composite freight rate index	The index of truckload freight rate	The index of pipeline rate
Forecast values according to ARIMA-models (% of the previous month)			
March 2016	99.7	100.4	100.6
April 2016	103.6	100.4	103.4
May 2016	99.7	100.3	102.8
June 2016	99.6	100.3	102.7
July 2016	103.6	100.3	100.7
August 2016	99.64	100.3	100.5
Forecast values according to ARIMA-models (% of December of the previous year)			
March 2016	104.1	103.8	103.8
April 2016	107.9	104.2	104.2
May 2016	107.5	104.6	104.6
June 2016	107.2	104.9	104.9
July 2016	111.1	105.3	105.3
August 2016	110.7	105.6	105.6
For reference: actual values in the same period of 2015 (% of the previous month)			
March 2015	99.9	98.9	99.9
April 2015	102.9	98.3	107.3
May 2015	99.7	99.6	99.7
June 2015	100.6	100.6	100.8
July 2015	107.0	100.2	114.2
August 2016	100.9	101.8	100.7

Note. Over the period from September 1998 to December 2015, the series of the freight rates index were identified as stationary ones; the other series were identified as stationary ones over the period from September 1998 to November 2015, too; fictitious variables for taking into account particularly dramatic fluctuations were used in respect of all the series.

World Prices of Natural Resources

This section presents calculations of such average monthly values of Brent crude prices (US$ per barrel), the aluminium prices (US$ per ton), the gold prices ($ per ounce), the copper prices (US$ per ton) and the nickel prices (US$ per ton) over March–August 2016 as were received on the basis of nonlinear models of time series evaluated on the basis of the IMF data over the period from January 1980 to January 2016.

The average forecast of crude oil price amounts to around $39.6 per barrel, which is below its corresponding year-earlier indices on average by 30.3%. Aluminum prices are forecast at around $1,464.0 per ton and their average forecast reduction constitutes about 14% compared to the same level last year. Forecast for gold prices constitute around $1,129.0 per ounce. Average forecast for copper prices constitute around $4,275.0 per ton and of nickel prices – about $8,157 per ton. Average forecast price fall on gold constitutes around 3%, average reduction of copper prices – about 26%, average reduction of nickel prices – 34% compared to the corresponding level of last year.

Table 8

CALCULATIONS OF FORECAST VALUES OF WORLD PRICES ON NATURAL RESOURCES

Month	Brent oil ($ per barrel)	Aluminum ($ per ton)	Gold ($ per ounce)	Copper ($ per ton)	Nickel ($ per ton)
Forecast values					
March 2016	42.64	1479	1124	4335	8217
April 2016	38.30	1479	1106	4296	8190
May 2016	39.21	1464	1112	4269	8059
June 2016	40.56	1462	1142	4253	8102
July 2016	37.30	1459	1144	4247	8165
August 2016	39.74	1445	1147	4247	8211
Expected growth on the respective month of the previous year (%)					
March 2015	-23.6	-16.6	-4.6	-27.0	-40.3
April 2015	-35.5	-18.7	-7.7	-28.9	-36.2
May 2015	-39.3	-18.9	-7.3	-32.2	-40.4
June 2015	-34.9	-13.4	-3.4	-27.1	-36.8
July 2015	-33.2	-11.0	1.3	-22.2	-28.5
August 2015	-15.4	-6.7	2.7	-17.2	-20.9
For reference: actual values in the same period of 2015					
March 2015	55.79	1774	1179	5940	13756
April 2015	59.39	1819	1198	6042	12831
May 2015	64.56	1804	1199	6295	13511
June 2015	62.35	1688	1182	5833	12825
July 2015	55.87	1640	1130	5457	11413
August 2015	46.99	1548	1117	5127	10386

Note. Over the period from January 1980 to January 2016, the series of prices of crude oil, nickel, gold, copper and aluminum are series of DS type.

MONETARY INDICES

Table 9

THE FORECAST OF M_2 AND THE MONETARY BASE

The future values of the monetary base (in the narrow definition: cash funds and the Fund of Mandatory Reserves (FMR)) and M_2 monetary aggregate over the period from February to July 2016 were received on the basis of models of time-series of respective indices calculated by the CBR[1] over the period from October 1998 to February (December 2015 – for M2 time series) 2016. Table 9 presents the results of calculations of forecast values and actual values of those indices in the same period of previous year. It is to be noted that due to the fact that the monetary base is an instrument of the CBR policy, forecasts of the monetary base on the basis of time-series models are to a certain extent notional as the future value of that index is determined to a great extent by decisions of the CBR, rather than the inherent specifics of the series.

In March–August 2016, the forecast monthly growth of the monetary base will average 0.3%, and money indicator M2 – at the average monthly rate of 0.8%.

Period	The Monetary base		M_2	
	Billion Rb	Growth on the previous month, %	Billion Rb	Growth on the previous month, %
Mar 16	8418	2.7	2702	0.8
Apr 16	8338	-1.0	2986	0.8
May 16	8546	2.5	3272	0.8
Jun 16	8466	-0.9	3560	0.8
Jul 16	8677	2.5	3850	0.8
Aug 16	8597	-0.9	4141	0.8
For reference: actual value in the respective months of 2015 (growth on the previous month, %)				
Mar 15	-0.6		-0.3	
Apr 15	-2.3		1.5	
May 15	2.3		0.6	
Jun 15	-2.0		0.6	
Jul 15	1.3		0.5	
Aug 15	1.0		1.1	

Note. Over the period from October 1998 to February (December 2015) 2016, all the time series of monetary indices were attributed to the class of series which are stationary in the first-order differences and have an explicit seasonal component.

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1 The data on the specific month is given in accordance with the methods of the CBR as of the beginning of the following month.

INTERNATIONAL RESERVES

This section presents the outputs of the statistical estimation of such future values of the international reserves of the Russian Federation[1] as were received on the basis of evaluation of the model of time series of the gold and foreign exchange reserves on the basis of the data released by the CBR over the period from October 1998 to February 2016. That index is forecast without taking into account a decrease in the amount of reserves due to foreign debt payment and for that reason the values of the volumes of the international reserves in the months where foreign debt payments are made may happen to be overestimated (or, otherwise, underestimated) as compared to the actual ones.

Subsequent to the forecast results over March–August 2016, international reserves will be growing by average monthly rate of 0.7%.

THE FORECAST OF THE INTERNATIONAL RESERVES OF THE RUSSIAN FEDERATION

Period	Forecast values according to ARIMA-model	
	Billion USD	Growth on the previous month, %
Mar 16	375.7	1.1
Apr 16	380.7	1.3
May 16	382.8	0.5
Jun 16	383.9	0.3
Jul 16	385.5	0.4
Aug 16	387.1	0.4
For reference: actual values in the same period of 2015		
	Billion USD	Growth on the previous month, %
Mar 15	360.2	-4.2
Apr 15	356.4	-1.1
May 15	356.0	-0.1
Jun 15	356.8	0.2
Jul 15	361.6	1.3
Aug 15	357.6	-1.1

Note. Over the period from October 1998 to February 2016, the series of the gold and foreign exchange reserves of the Russian Federation were identified as stationary series in difference.

FOREIGN EXCHANGE RATES

The model calculations of prospective values of the foreign exchange rates (RUR per USD and USD per euro) were made on the basis of assessment of the time series models (ARIMA) and structural models (SM) of the relevant indicators released by the Central Bank of Russia as of the last date of each month over the periods from October 1998 to February 2016 and from January 1999 to February 2016[2], respectively.

USD/RUR average exchange rate is forecast along two models in the amount of Rb 77.08 for USD. Euro/USD average exchange rate is forecast at USD 1.010per 1 euro.

FORECASTS OF THE USD/RUR AND EUR/USD EXCHANGE RATES

Period	The USD/RUR exchange rate (RUR per USD)		The EUR/USD exchange rate (USD per EUR)	
	ARIMA	SM	ARIMA	SM
Mar 16	75.55	74.98	1.09	1.11
Apr 16	76.09	76.29	1.09	1.10
May 16	76.82	76.72	1.09	1.10
Jun 16	77.51	77.17	1.09	1.11
Jul 16	78.21	78.21	1.09	1.10
Aug 16	78.92	78.52	1.09	1.11
For reference: actual values in the similar period of 2015				
Mar 15	58.46		1.07	
Apr 15	51.70		1.12	
May 15	52.97		1.10	
Jun 15	55.52		1.12	
Jul 15	58.99		1.10	
Aug 15	66.48		1.11	

Note. Over the respective periods, the series under review were identified as integrated series of the first order with a seasonal component.

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1 The data on the volume of the gold and foreign exchange reserves is presented as of the first day of the following month.

2   The authors use the IMF data over the period from January 1999 to December 2015. The data over the period from January to February 2016 was obtained from the foreign exchange rate statistics website: www.oanda.com

THE LIVING STANDARD INDICES

This section (Table 12) presents calculations of forecast values of indices of real wages, real disposable income and real income [1] as were received on the basis of the model of time series of respective indices computed by Rosstat and taken over the period from January 1999 to January 2016. The above indices depend to a certain extent on the centralized decisions on raising of wages and salaries to public sector workers, as well as those on raising of pensions, scholarships and allowances; such a situation introduces some changes in the dynamics of the indices under review. As a result, the future values of the indices of real wages and real disposable income calculated on the basis of the series which last observations are either considerably higher or lower than the previous ones due to such a raising may differ greatly from those which are implemented in reality.

According to the results presented in *Table 12*, in March–August 2016, the forecast average monthly growth of the real disposable money income will constitute 4.1% per month compared to the same period of last year. The average monthly decrease of the real money income in the intervening period is forecast at 4.9% against the corresponding period last year. The real wages will continue falling at average monthly rate of 9.1%.

Table 12

THE FORECAST OF THE LIVING STANDARD INDICES

Period	Real disposable money income	Real money income	Real accrued wages
Forecast values according to ARIMA-models (% of the respective month of 2015)			
Mar 16	97.9	96.9	89.4
Apr 16	97.6	96.6	90.4
May 16	92.7	92.4	92.6
Jun 16	96.2	95.1	91.4
Jul 16	96.2	95.8	90.8
Aug 16	95.0	94.1	91.0
For reference: actual values in the respective period of 2015 (% of the same period of 2014)			
Mar 15	98.0	97.7	96.6
Apr 15	97.6	97.4	90.4
May 15	98.2	97.9	90.6
Jun 15	100.5	100.5	91.6
Jul 15	99.6	99.1	92.6
Aug 15	100.5	100.3	95.3

Note. For calculating purposes, the series of the real disposable money income, real money income and real accrued wages in the base form were used (January 1999 was adopted as a base period). Over the period from January 1999 to January 2016 those series were attributed to the class of processes which are stationary in differences and have an explicit seasonal component.

EMPLOYMENT AND UNEMPLOYMENT

For the purpose of calculation of the future values of the employment (of the number the gainfully employed population) and the unemployment (the total number of the unemployed), models of the time series evaluated over the period from October 1998 to December 2015 on the basis of the monthly data released by Rosstat[2] were used. The unemployment was calculated on the basis of the models with results of the findings from business surveys,[3] too. It is to be noted that feasible logical inconsistencies[4] in forecasts of employment and unemployment which totals should be equal to the index of economically active population may arise due to the fact that each series is forecast individually and not as a difference between the forecast values of the economically active population and another index.

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1 *Real cash income* is a relative index which is calculated by means of division of the index of the nominal size (which was actually formed in the period under review) of households' cash income by the CPI. Real disposable cash income is cash income minus mandatory payments and contributions. (See: Rossiisky Statistichesky Ezhegodnik, Moscow, Rosstat, 2004, p. 212).

2 The index is computed in accordance with the methods of the International Labor Organization (ILO) and is given as of the month-end.

3 The model is evaluated over the period from January 1999 to December 2015.

4 For example, deemed as such a difference may be a simultaneous decrease both in the employment and the unemployment. However, it is to be noted that in principle such a situation is possible provided that there is a simultaneous decrease in the number of the economically active population.

CALCULATION OF FORECAST VALUES OF THE INDICES THE EMPLOYMENT AND THE UNEMPLOYMENT

Month	Employment (ARIMA)		Unemployment (ARIMA)			Unemployment (BS)		
	Million people	Growth on the respect-ive month of previous year (%)	Million people	Growth on the respect-ive month of previous year (%)	% of the index of the number of the gainfully employed population	Million people	Growth on the respective month of previ-ous year (%)	% of the index of the number of the gainfully employed population
March 2016	72.3	1.0	4.6	2.3	6.4	4.3	-3.7	5.9
April 2016	72.4	1.1	4.4	1.1	6.1	4.3	-2.1	5.9
May 2016	72.9	0.3	4.2	-1.3	5.8	4.2	-0.7	5.8
June 2016	72.7	0.4	4.2	2.3	5.8	4.2	3.0	5.8
July 2016	73.0	-0.1	4.2	2.9	5.8	4.2	2.6	5.8
August 2016	73.2	-0.1	4.2	2.2	5.7	4.3	2.6	5.9
For reference: actual values in the same periods of 2015 (million people)								
March 2015	71.6			4.5				
April 2015	71.6			4.4				
May 2015	72.7			4.3				
June 2015	72.4			4.1				
July 2015	73.1			4.1				
August 2015	73.3			4.1				

Note. Over the period from October 1998 to December 2015, the series of employment is a stochastic process which is stationary around the trend. The series of unemployment is a stochastic process with the first order integration. Both indices include seasonal component.

According to ARIMA-model forecast (*Table 13*), in March–August 2016, the number of employed in the economy will grow at the average rate of 0.4% monthly against the corresponding period of the previous year.

Average increment of the total number of jobless is forecast at 0.9% per month against the corresponding period last year.

ANNEX

Diagrams of the Time Series of the Economic Indices of the Russian Federation

Fig. 1a. The Rosstat industrial production index (ARIMA-model) (% of December 2001)
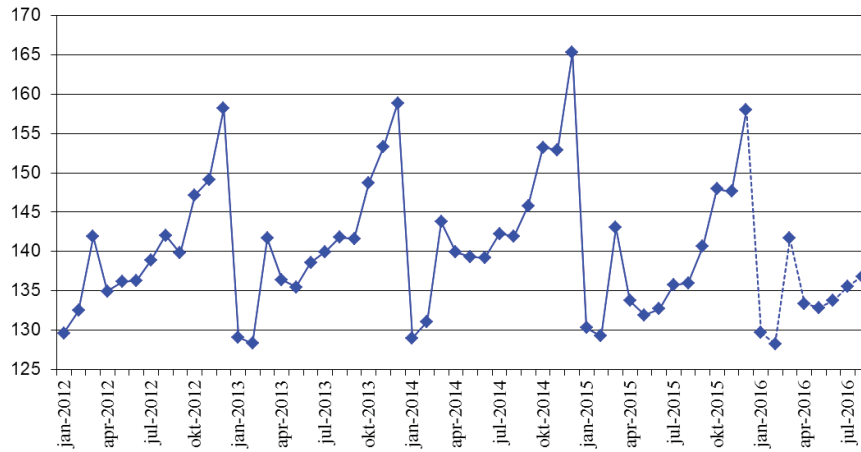
Fig. 1b. The NRU HSE industrial production index (ARIMA-model) (% of January 2005)
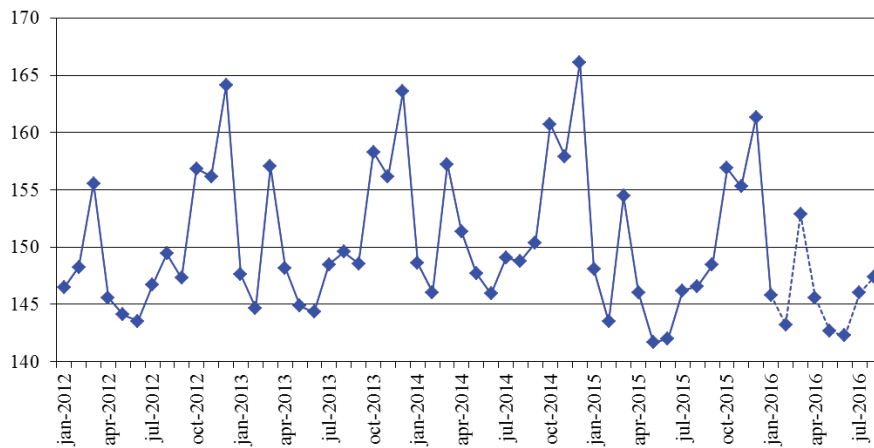
Fig. 2a. The Rosstat industrial production index for mining (% of December 2001)
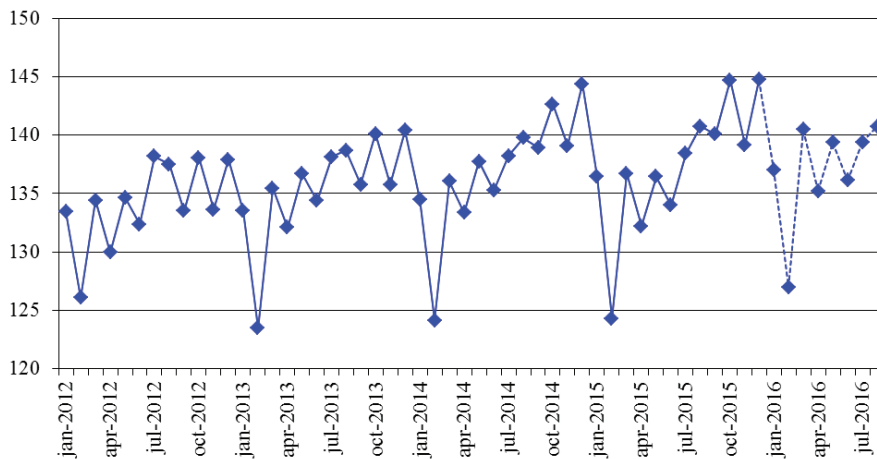
Fig. 2b. The NRU HSE industrial production index for mining (% of January 2005)
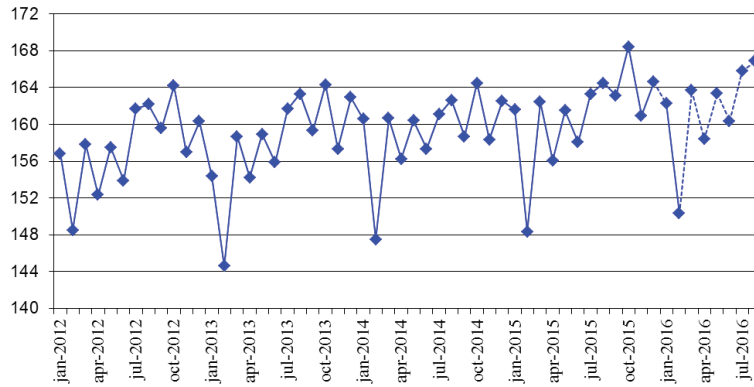
Fig. 3a. The Rosstat industrial production index for manufacturing
(% of December 2001)
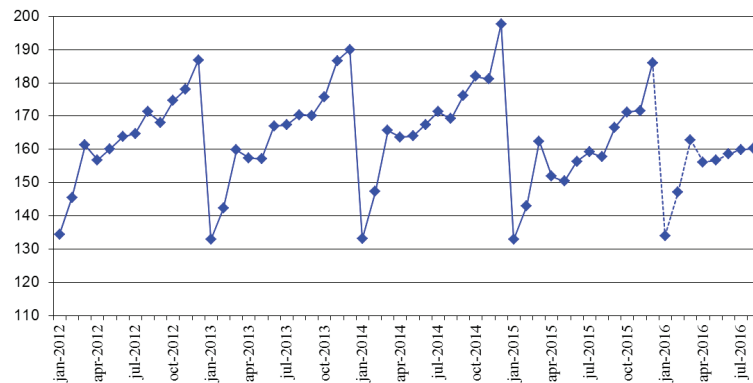
Fig. 3b. The NRU HSE industrial production index for manufacturing
(% of January 2005)
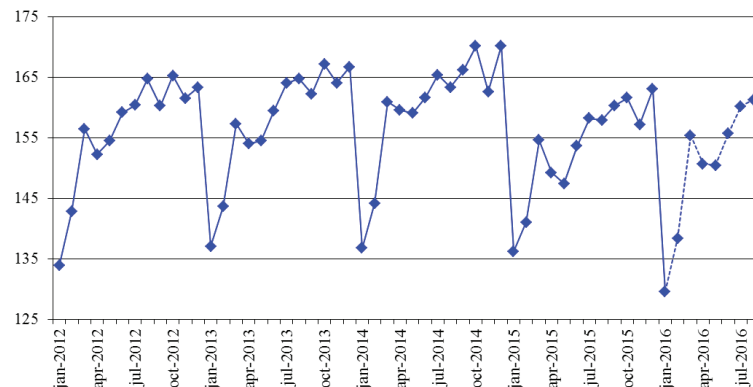
Fig. 4a. The Rosstat industrial production index for utilities (electricity, water, and gas)
(as a percentage of that in December 2001)
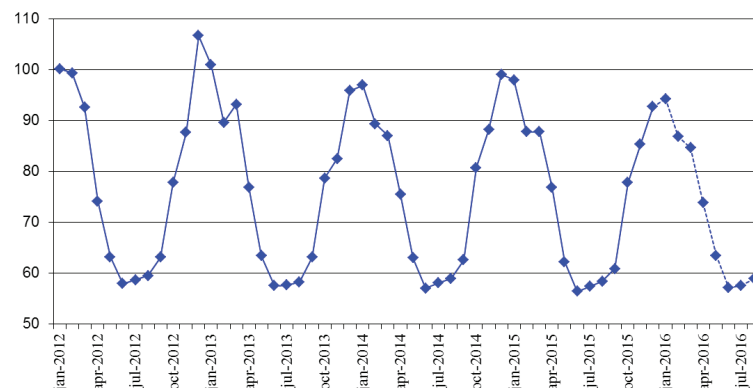
Fig. 4b. The NRU HSE industrial production index for utilities (electricity, water, and gas)
(as a percentage of that in January 2005)
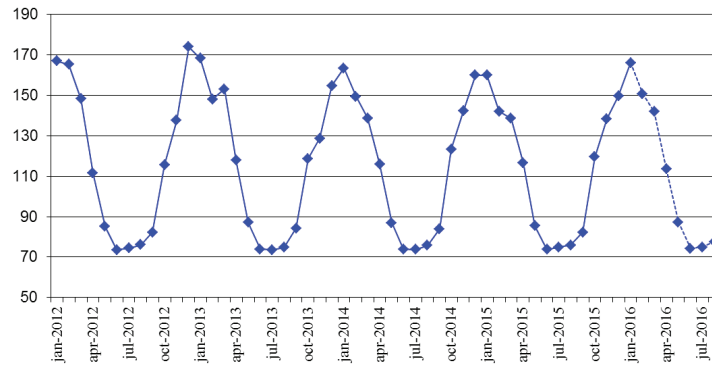
Fig. 5a. The Rosstat industrial production index for food products
(as a percentage of that in December 2001)
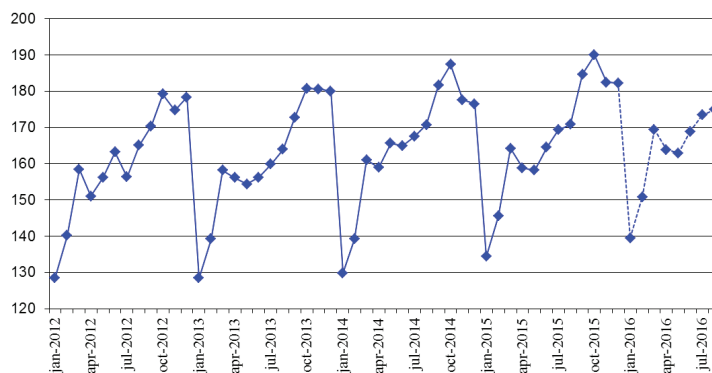
Fig. 5b. The NRU HSE industrial production index for food products
(as a percentage of that in January 2005)
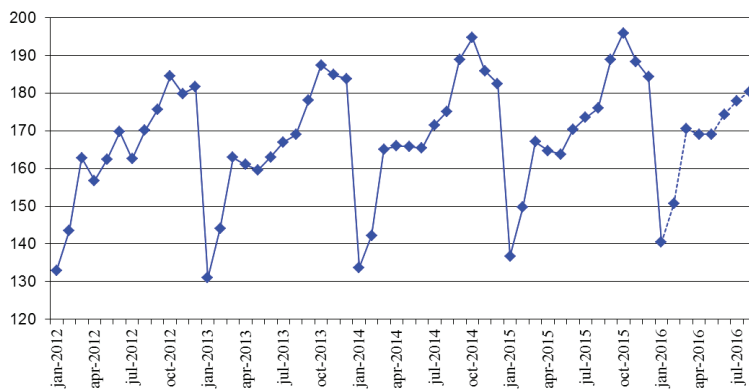
Fig. 6a. The Rosstat industrial production index for coke and petroleum
(as a percentage of that in December 2001)
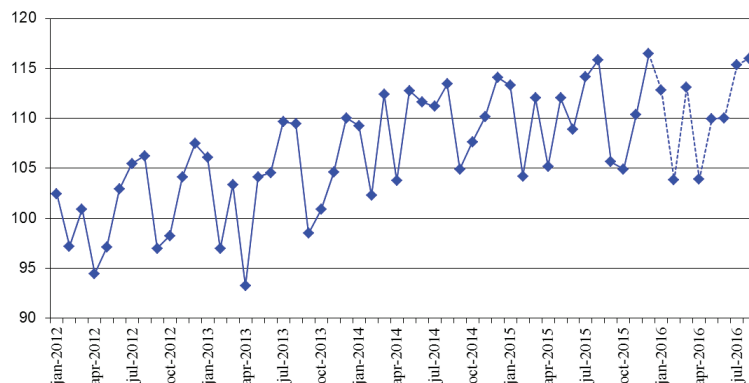
*Fig. 6b. The NRU HSE industrial production index for petroleum and coke
(as a percentage of that in January 2005)*
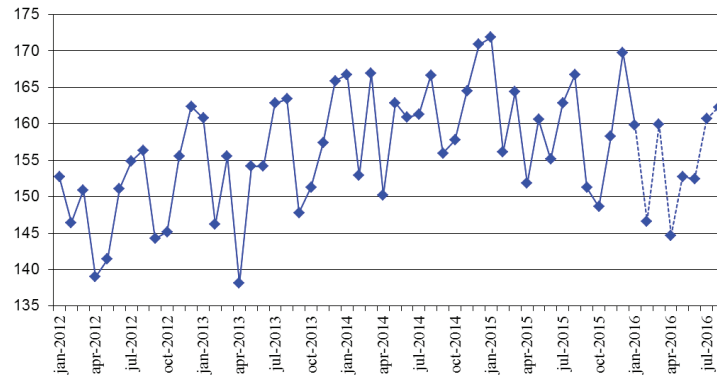
*Fig.7a. The Rosstat industrial production index for primary metals and fabricated metal products
(as a percentage of that in December 2001)*
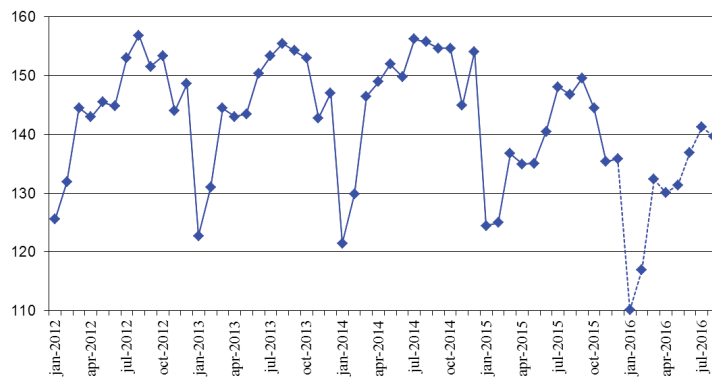
*Fig. 7b. The NRU HSE industrial production index for primary metals and fabricated metal products
(as a percentage of that in January 2005)*
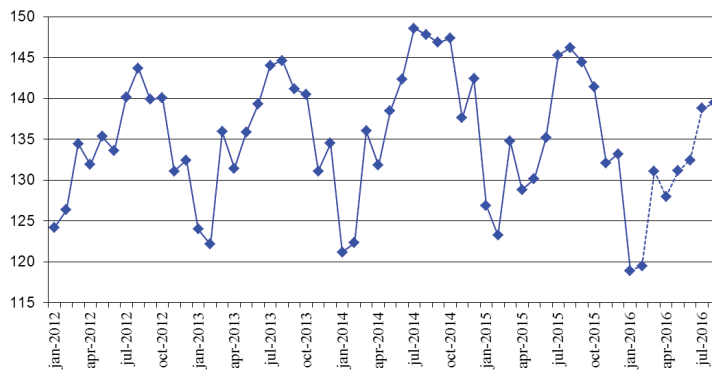
*Fig. 8a. The Rosstat industrial production index for machinery
(as a percentage of that in December 2001)*
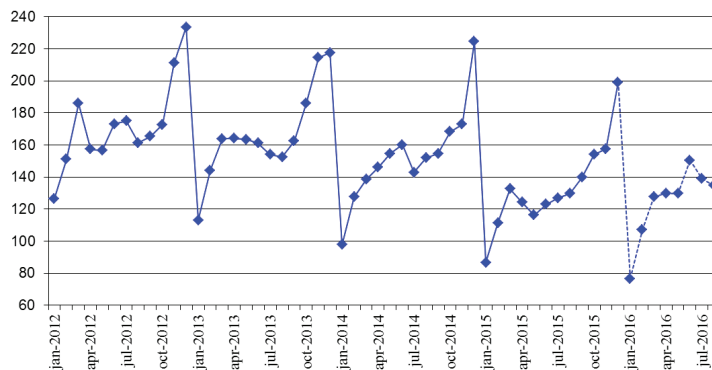
Fig. 8b. The NRU HSE industrial production index for machinery
(as a percentage of that in January 2005)
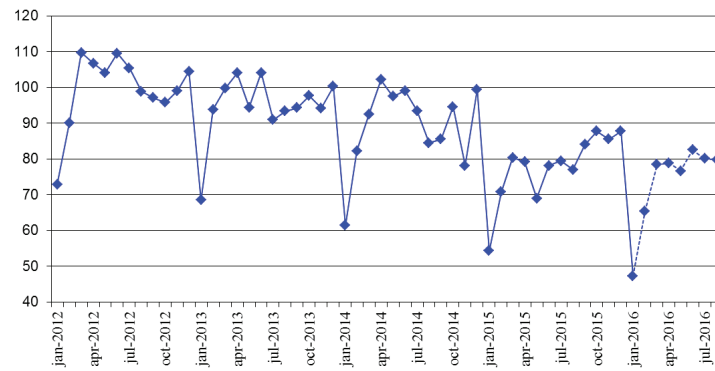
Fig. 9. The volume of retail sales
(billion Rb)
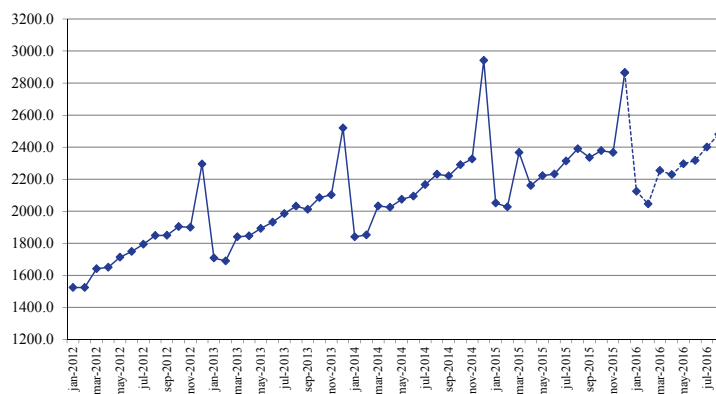
Fig. 9a. The real volume of retail sales
(as a percentage of that in the same period of the previous year)
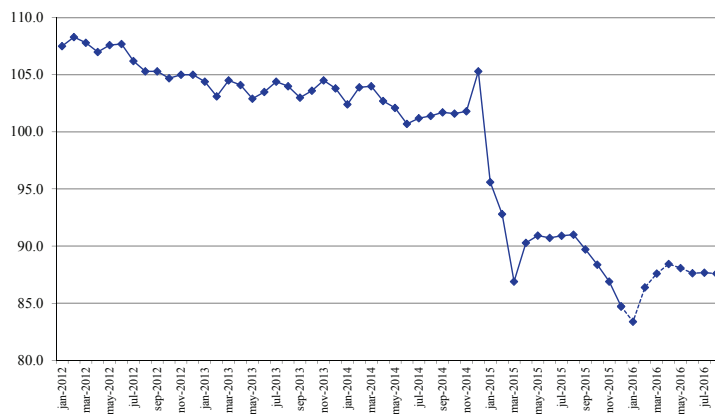
Fig. 10. Investments in capital assets (billion Rb)
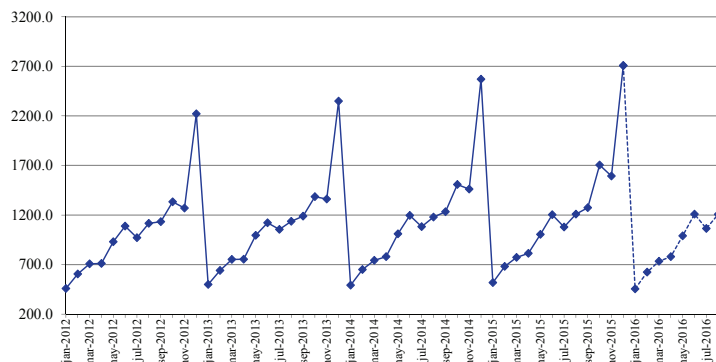
Fig. 10a. Real investments in capital assets
(as a percentage of those in the same period of the previous year)
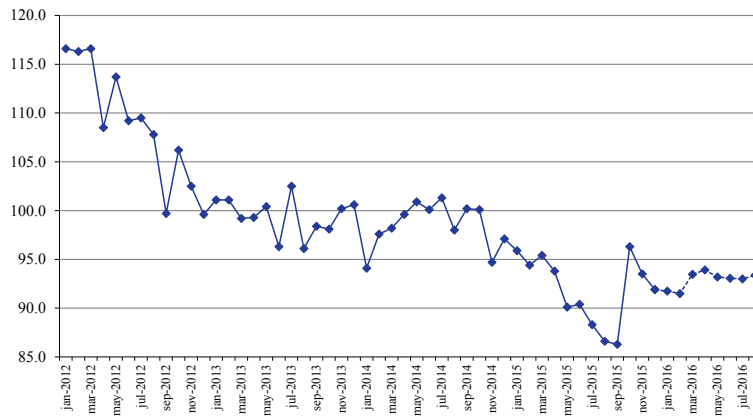
Fig.11. Export to all countries (billion USD)
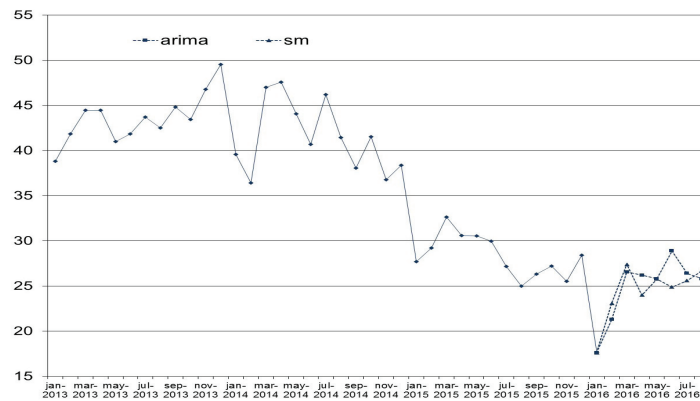
Fig. 12. Export to countries outside the CIS (billion USD)
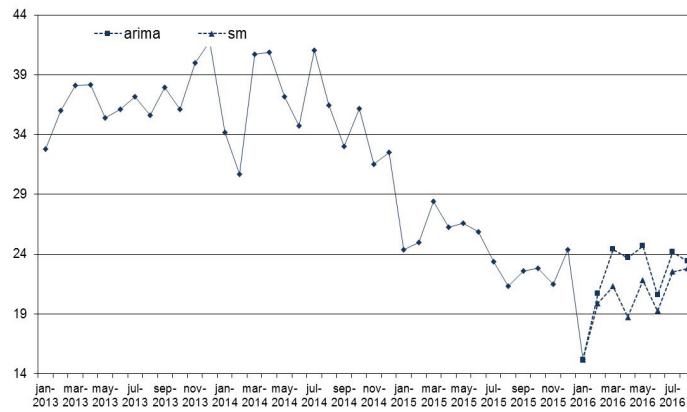
Fig. 13. Import from all countries (billion USD)
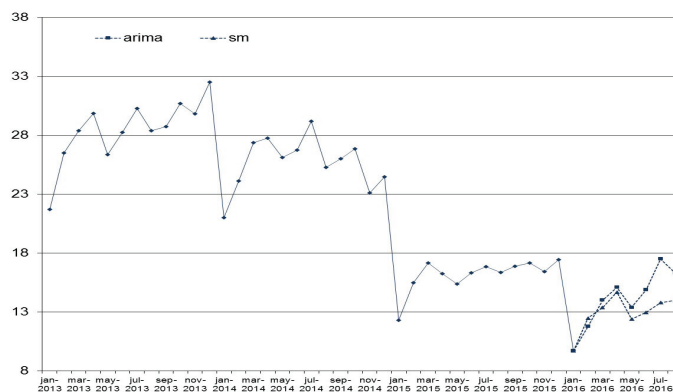
Fig. 14. Import from countries outside the CIS (billion USD)
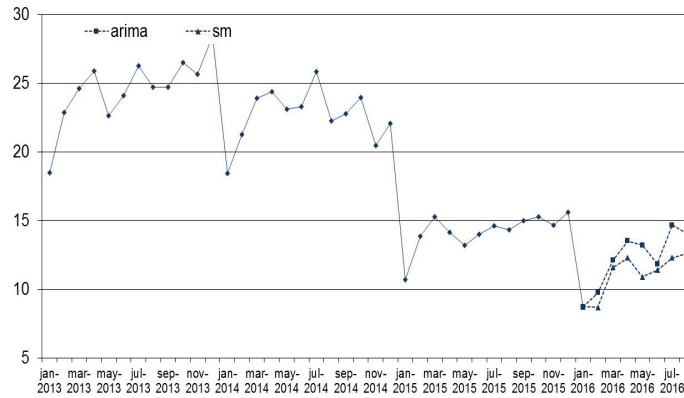
Fig. 15. The consumer price index
(as a percentage of that in December of the previous year)
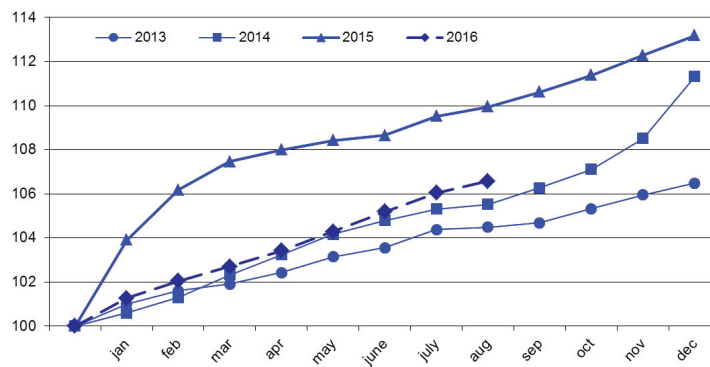
Fig. 15a. The consumer price index
(as a percentage of that in December of the previous year) (SM)
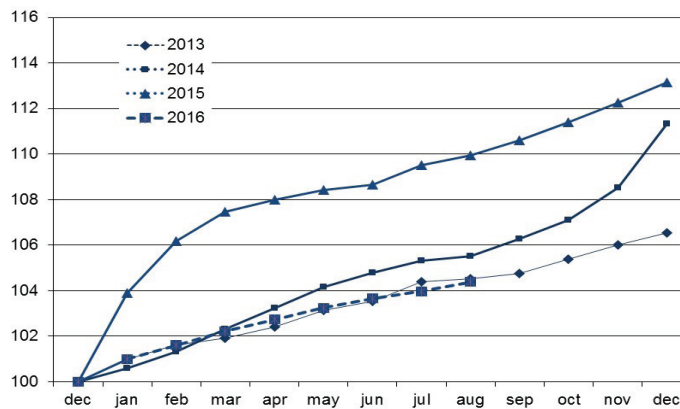
Fig.16. The producer price index for industrial goods
(as a percentage of that in December of the previous year)
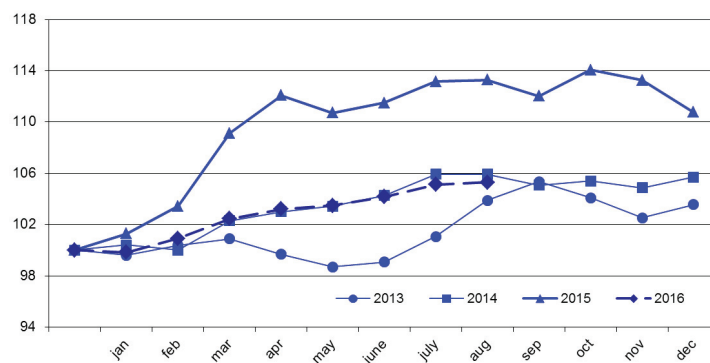
Fig. 17. The price index for mining
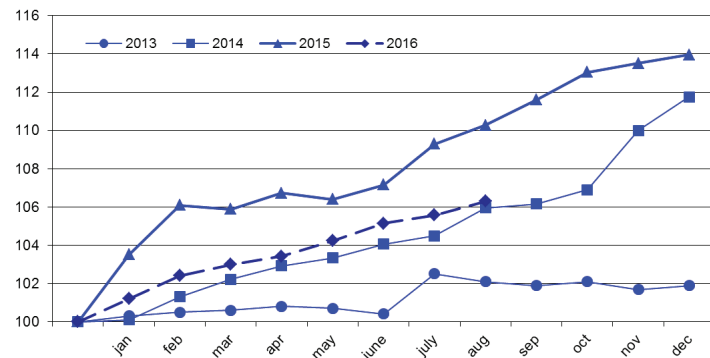(as a percentage of that in December of the previous year)
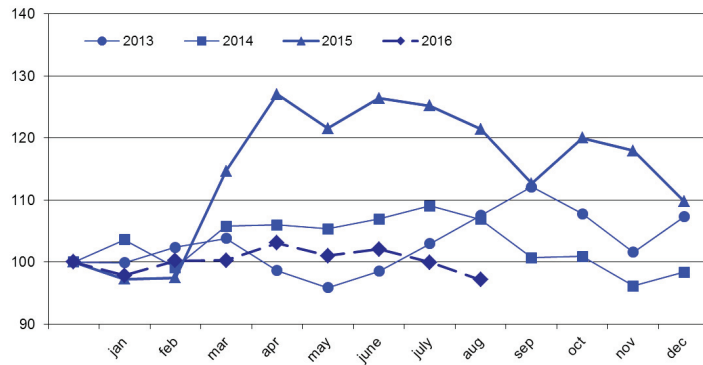
Fig. 18. The price index for manufacturing
(as a percentage of that in December of the previous year)
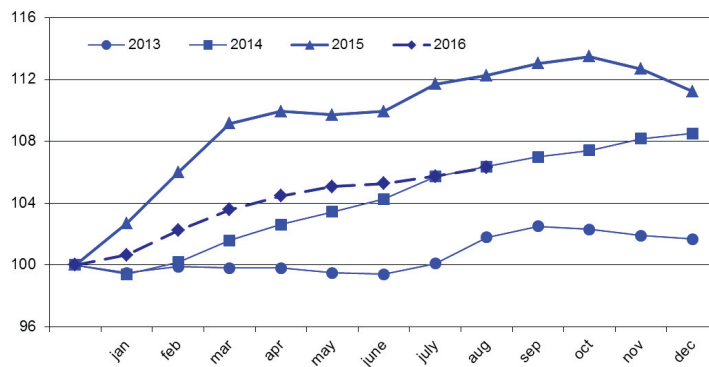
Fig. 19. The price index for utilities (electricity, water, and gas)
(as a percentage of that in December of the previous year)
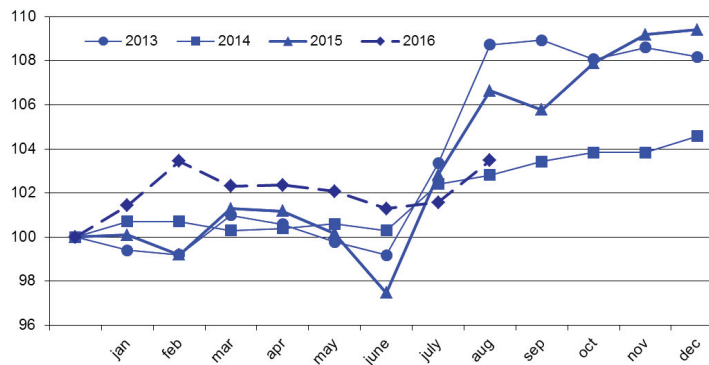
Fig. 20. The price index for food products
(as a percentage of that in December of the previous year)
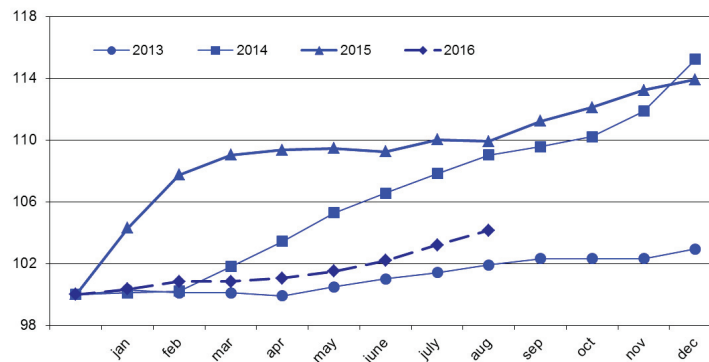
Fig. 21. The price index for the textile and sewing industry
(as a percentage of that in December of the previous year)
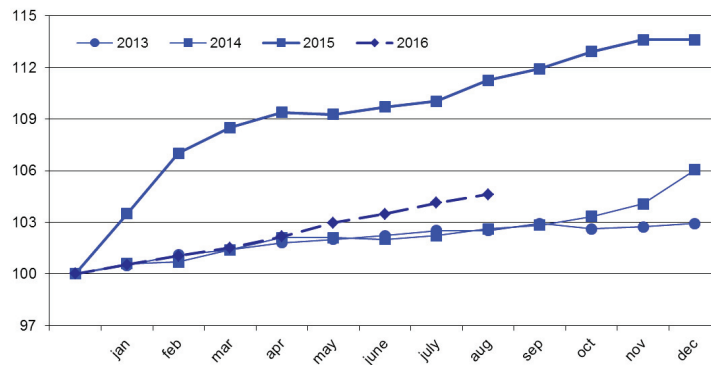
Fig. 22. The price index for wood products
(as a percentage of that in December of the previous year)
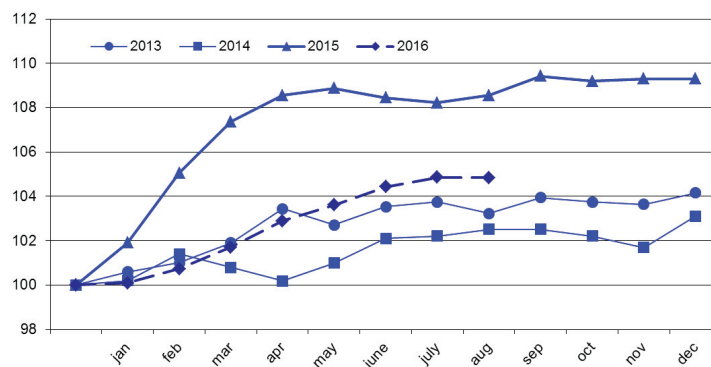
Fig. 23. The price index for the pulp and paper industry
(as a percentage of that in December of the previous year)
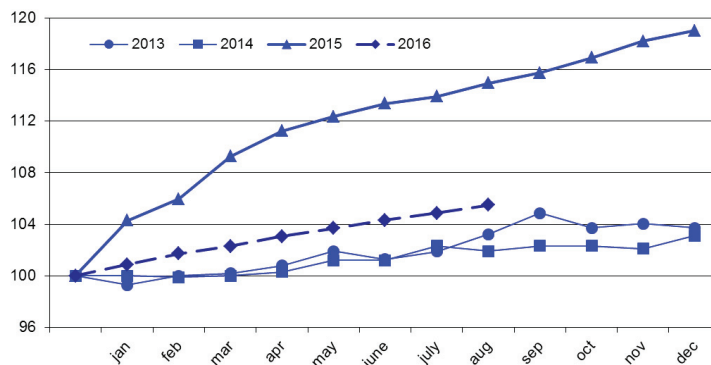
Fig. 24. The price index for coke and petroleum
(as a percentage of that in December of the previous year)
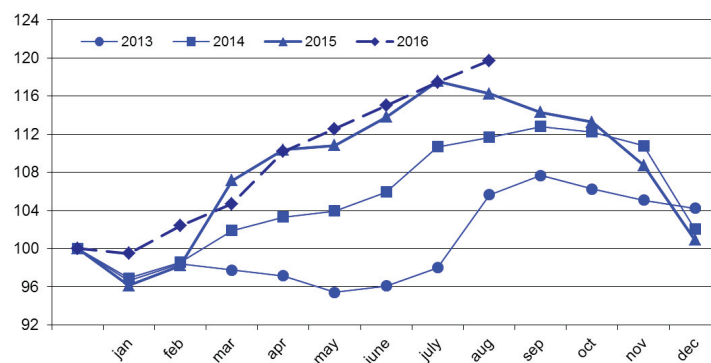
Fig. 25. The price index for the chemical industry
(as a percentage of that in December of the previous year)
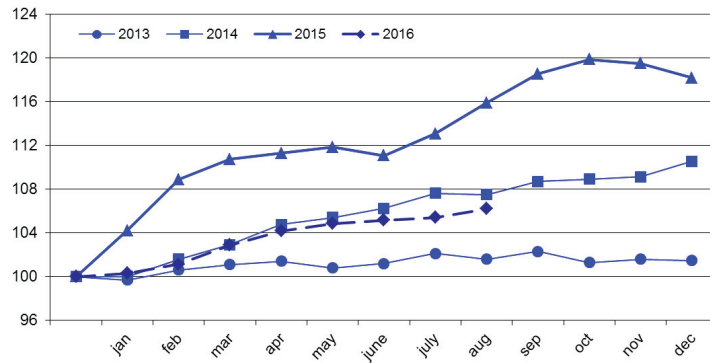
Fig.26. The price index for primary metals and fabricated metal products
(as a percentage of that in December of the previous year)
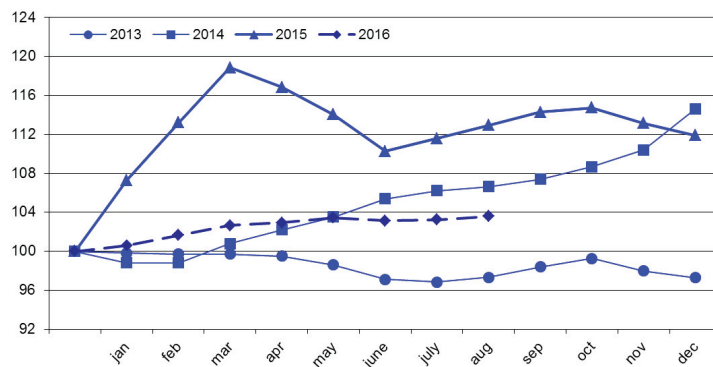
Fig.27. The price index for machinery
(as a percentage of that in December of the previous year)

Fig.28. The price index for transport equipment manufacturing
(as a percentage of that in December of the previous year)
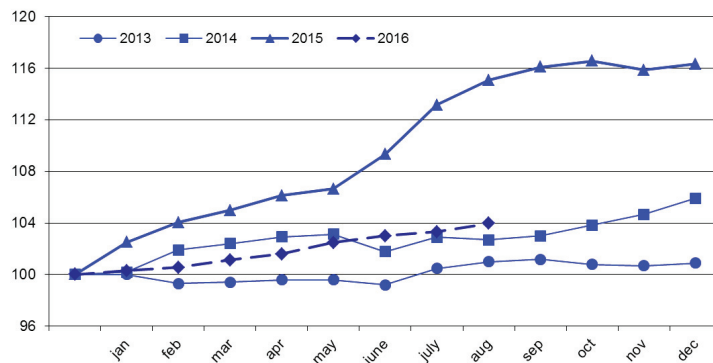
Fig. 29. The cost of the monthly
per capita minimum food basket (Rb)
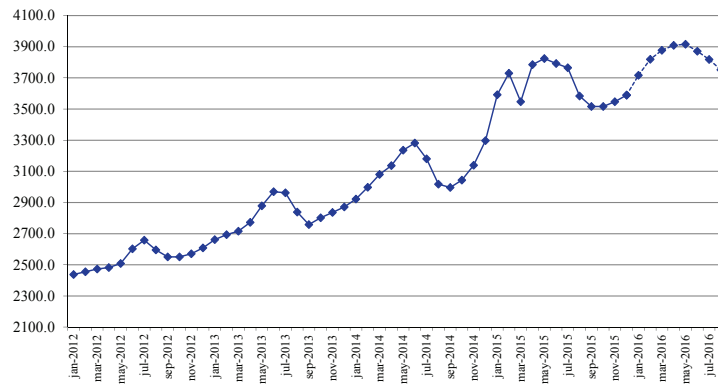
Fig. 30. The composite index of transport tariffs
(for each year, as a percentage of that in the previous month)
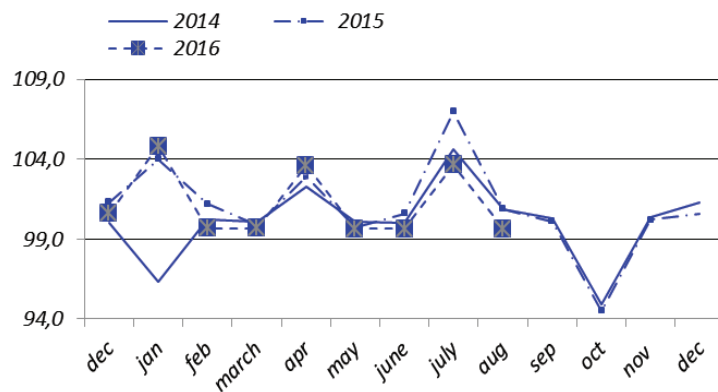
Fig. 31. The index of motor freight tariffs
(for each year, as a percentage of that in the previous month)
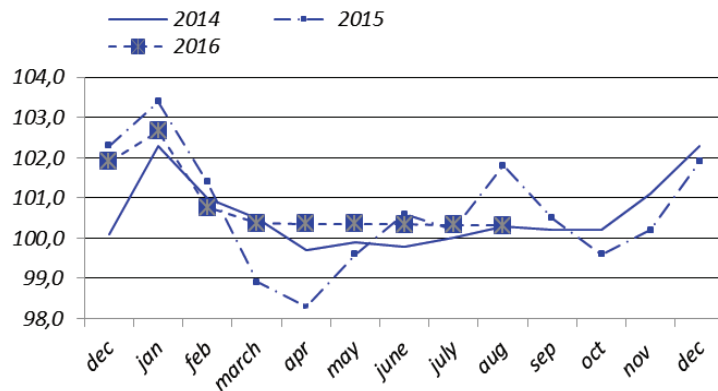
Fig. 32. The index of pipeline tariffs
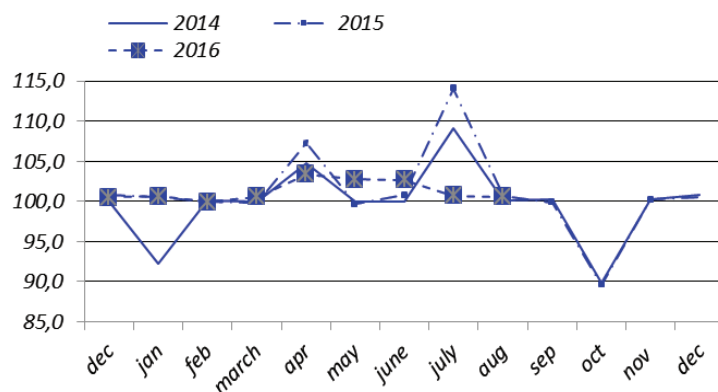(for each year, as a percentage of that in the previous month)
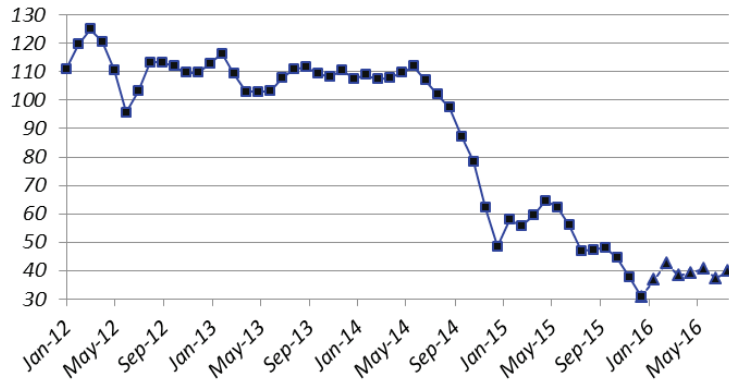
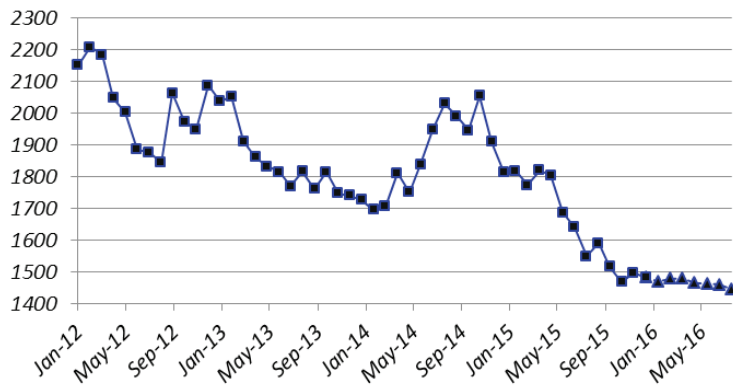Fig. 33. The Brent oil price ($ per barrel)

Fig. 34. The aluminum price ($ per ton)
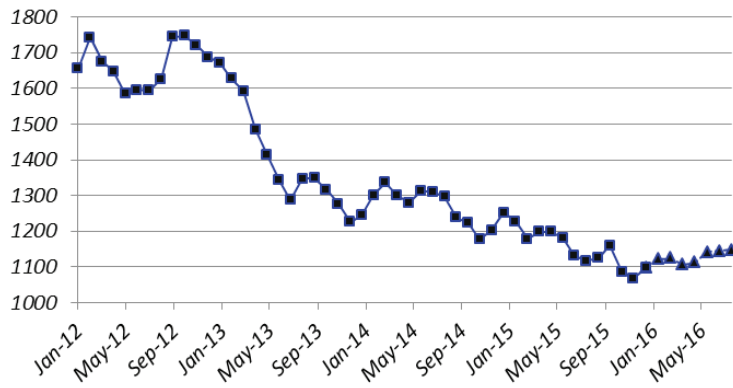
Fig. 35. The gold price ($ per ounce)
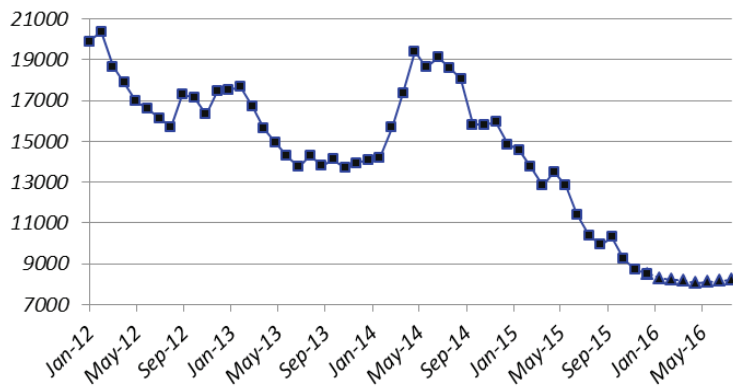
Fig. 36. The nickel price ($ per ton)
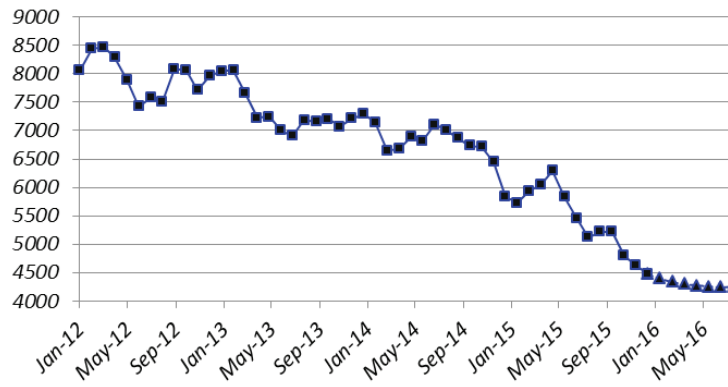
Fig. 37. The copper price ($ per ton)
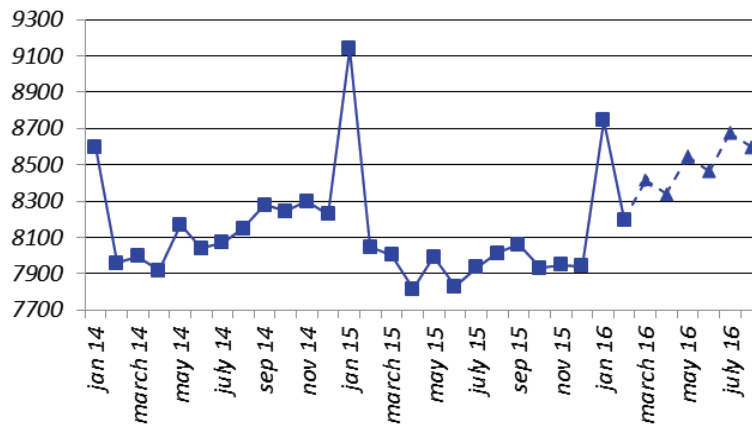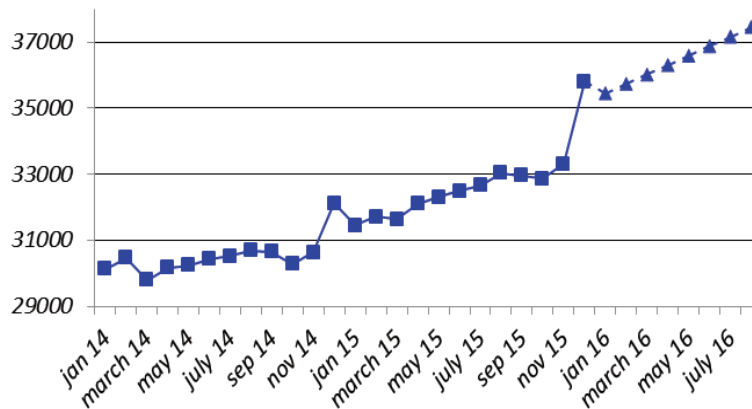

Fig. 38. The monetary base, billion Rb

Fig. 39. M₂, billion Rb

Fig. 40. The international reserves
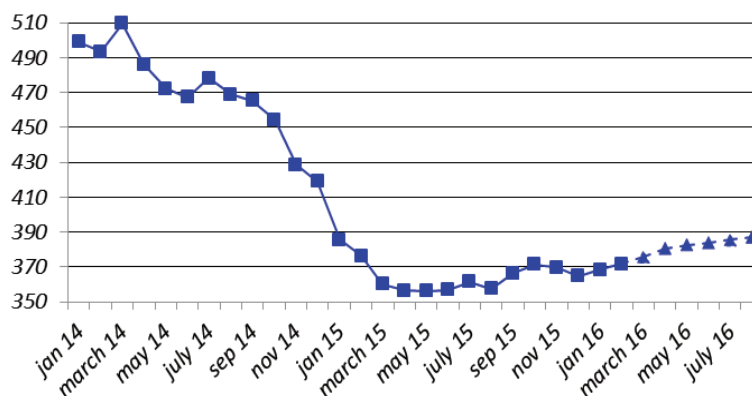of the Russian Federation, million USD

Fig. 41. The RUR/USD exchange rate

Fig. 42. The USD/EUR exchange rate
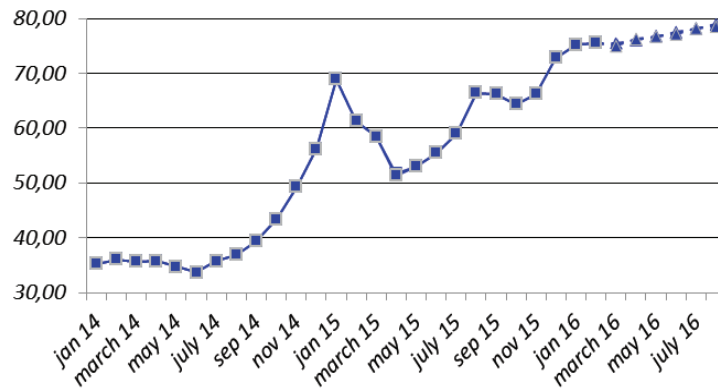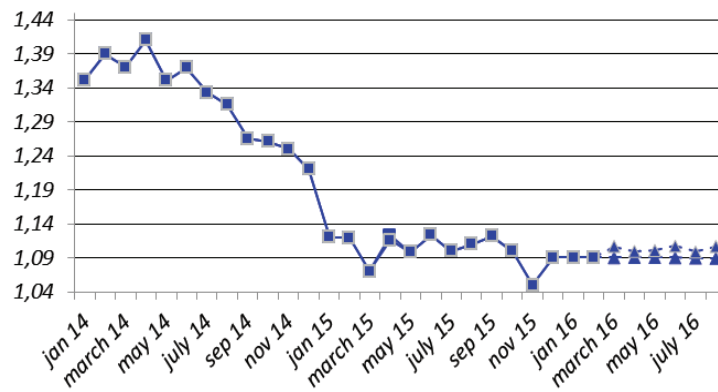

*Fig. 43. Real disposable cash income
(as a percentage of that in the same period of the previous year)*
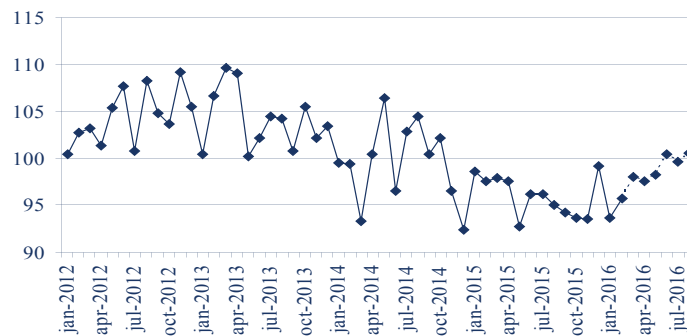

*Fig. 44. Real cash income
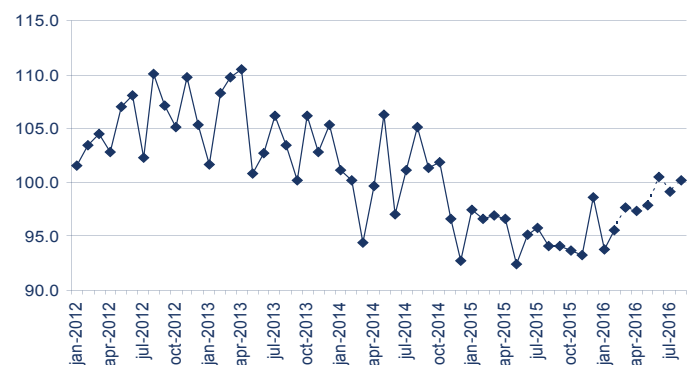(as a percentage of that in the same period of the previous year)*

Fig. 45. Real accrued wages
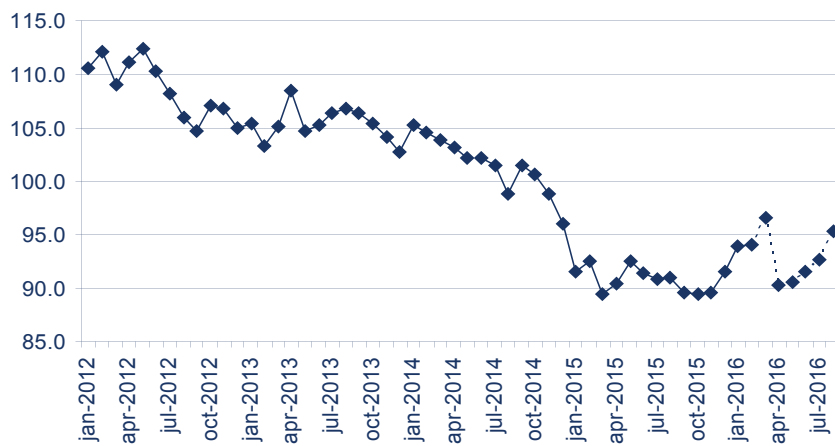(as a percentage of those in the same period of the previous year)
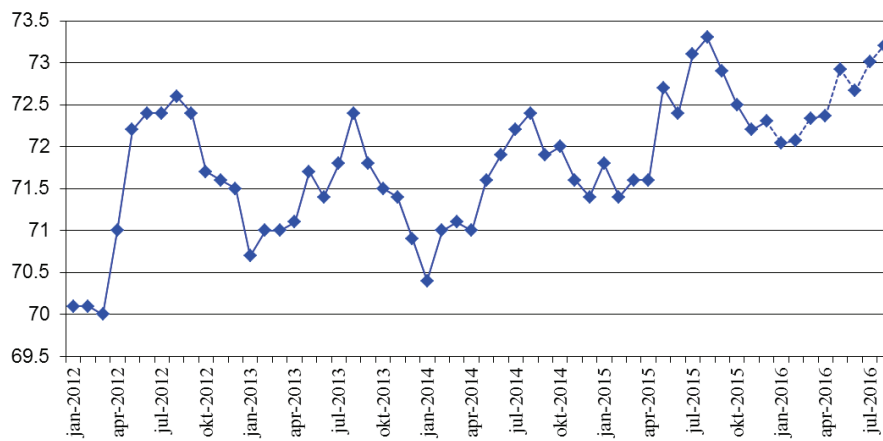

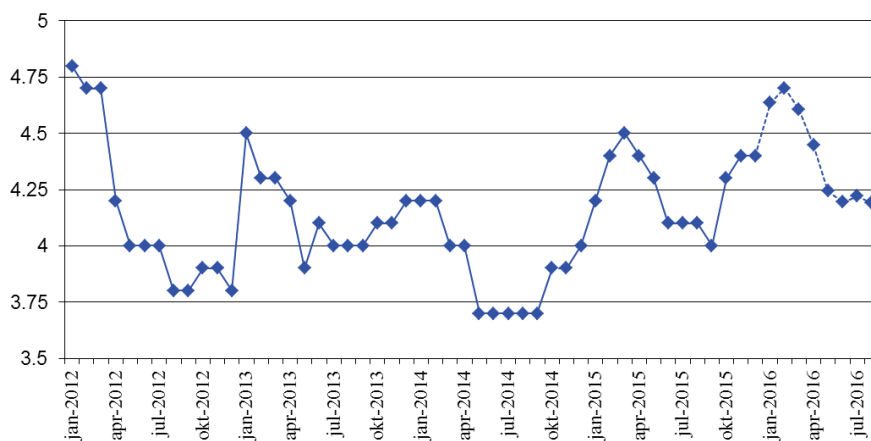Fig. 46. Employment (million people)

Fig. 47. Unemployment (million people)

Model calculations of short-term forecasts of social and economic indices of the Russian Federation: February 2016

Index	Dec 2015	2016							
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Rosstat IIIP (growth rate, %)*	-4,5	-0,5	-1,5	-1,7	-1,4	-0,9	-1,2	-1,9	-0,6
HSE IIP (growth rate %)*	-2,9	-1,5	-0,6	-1,0	-1,2	-0,1	-0,7	-1,3	0,3
Rosstat IIP for mining (growth rate, %)*	0,1	0,4	2,2	2,7	2,3	2,1	1,6	0,7	0,0
HSE IIP for mining (growth rate, %)*	1,3	0,4	1,4	0,8	1,5	1,2	1,5	1,5	1,4
Rosstat IIIP for manufacturing (growth rate, %)*	-6,1	0,8	2,9	0,2	2,8	4,2	1,4	0,4	1,6
HSE IIP for manufacturing (growth rate, %)*	-4,2	-4,9	-1,9	0,5	1,0	2,0	1,4	1,3	2,1
Rosstat IIP for utilities (electricity, water, and gas) (growth rate, %)*	-6,3	-3,8	-1,0	-3,6	-3,9	2,0	1,2	0,3	0,9
HSE for utilities (electricity, water, and gas) (growth rate, %)*	-6,4	3,8	6,2	2,5	-2,6	2,3	0,7	0,0	2,0
Rosstat IIP for food products (growth rate, %)*	3,1	3,8	3,7	3,1	3,2	3,0	2,6	2,5	2,4
HSE IIP for food products (growth rate, %)*	1,0	2,7	0,6	2,0	2,6	3,2	2,4	2,6	2,5
Rosstat IIP for coke and petroleum (growth rate, %)*	1,9	-0,4	-0,4	1,0	-1,2	-1,9	1,0	1,1	0,1
HSE for coke and petroleum (growth rate, %)*	-0,6	-7,0	-6,1	-2,7	-4,7	-4,9	-1,8	-1,3	-2,7
Rosstat for primary metals and fabricated metal products (growth rate, %)*	-13,3	-11,5	-6,4	-3,2	-3,6	-2,8	-2,5	-4,6	-4,8
HSE IIP for primary metals and fabricated metal products (growth rate, %)*	-6,5	-6,3	-3,0	-2,7	-0,6	0,8	-2,0	-4,5	-4,6
Rosstat IIIP for machinery (growth rate, %)*	-10,9	-11,5	-3,9	-3,8	4,5	11,6	22,4	9,4	3,8
HSE IIP for machinery (growth rate %)*	-11,7	-12,8	-7,6	-2,5	-0,4	11,0	5,6	0,9	3,6
Retail sales, trillion Rb	2,87	2,13	2,05	2,25	2,23	2,30	2,32	2,40	2,48
Real retail sales (growth rate, %)*	-15,28	-16,62	-13,62	-12,42	-11,57	-11,93	-12,37	-12,33	-12,40
Investments in capital assets, trillion Rb	2,71	0,45	0,62	0,73	0,78	0,99	1,21	1,06	1,21
Real investments in capital assets (growth rate, %)*	-8,10	-8,26	-8,51	-6,53	-6,07	-6,80	-6,94	-7,00	-6,63
Export to all countries (billion $)	28,4	17,6	22,2	27,0	25,1	25,8	26,9	26,0	26,3
Export to countries outside the CIS (billion $)	24,3	15,2	20,3	22,9	21,2	23,3	20,0	23,4	23,1
Import from all countries (billion $)	17,4	9,7	12,2	13,7	14,9	12,9	14,0	15,7	15,2
Import from countries outside the CIS (billion $)	15,6	8,7	9,3	11,9	12,9	12,1	11,7	13,5	13,4
CPI (growth rate, %)**	0,8	1,0	0,6	0,8	0,8	0,8	0,6	0,6	0,5
PPI for industrial goods (growth rate, %)**	-2,2	-0,4	1,7	1,7	1,1	1,0	0,6	0,7	0,7
PPI for mining (growth rate, %)**	-6,9	-2,2	2,5	0,0	2,8	-2,0	1,0	-2,1	-2,8
PPI for manufacturing (growth rate, %)**	-1,3	0,7	1,6	1,3	0,9	0,6	0,2	0,5	0,5
PPI for utilities (electricity, water, and gas) (growth rate, %)**	0,2	1,4	2,0	-1,1	0,0	-0,3	-0,8	0,3	1,9
PPI for food products (growth rate, %)**	0,6	0,3	0,5	0,0	0,2	0,4	0,7	1,0	0,9
PPI for the textile and sewing industry (growth rate, %)**	0,0	0,5	0,5	0,5	0,6	0,8	0,5	0,6	0,5
PPI for wood products (growth rate, %)**	0,0	0,1	0,6	1,0	1,2	0,7	0,8	0,4	0,0
PPI for the pulp and paper industry (growth rate, %)**	0,7	0,9	0,9	0,6	0,7	0,6	0,6	0,5	0,6
PPI for coke and petroleum (growth rate, %)**	-7,2	-0,5	2,9	2,2	5,3	2,1	2,2	2,1	1,9
PPI for the chemical industry (growth rate, %)**	-1,1	0,3	0,9	1,7	1,3	0,6	0,3	0,2	0,8

Index	Dec 2015	2016							
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
PPI for primary metals and fabricated metal products (growth rate, %)**	-1,1	0,6	1,0	1,0	0,3	0,5	-0,3	0,1	0,4
PPI for machinery (growth rate, %)**	0,4	1,2	1,2	0,6	0,4	0,8	0,9	0,4	0,7
PPI for transport equipment manufacturing (growth rate, %)**	0,4	0,3	0,3	0,6	0,5	0,9	0,5	0,3	0,6
The cost of the monthly per capita minimum food basket (thousand Rb)	3,59	3,72	3,82	3,88	3,91	3,92	3,87	3,82	3,75
The composite index of transportation tariffs (growth rate, %)**	1,9	2,7	0,8	0,4	0,4	0,3	0,3	0,3	0,3
The index of pipeline tariffs (growth rate, %)**	0,5	0,6	-0,1	0,6	3,4	2,8	2,7	0,7	0,5
The index of motor freight tariffs (growth rate, %)**	0,6	4,8	-0,3	-0,3	3,6	-0,3	-0,4	3,6	-0,36
The Brent oil price ($ a barrel)	37,7	30,8	36,7	42,6	38,3	39,2	40,6	37,3	39,7
The aluminum price (thousand $ a ton)	1,50	1,48	1,47	1,48	1,48	1,46	1,46	1,46	1,44
The gold price (thousand $ per ounce)	1,07	1,10	1,12	1,12	1,11	1,11	1,14	1,14	1,15
The nickel price (thousand $ a ton)	4,64	4,47	4,40	4,34	4,30	4,27	4,25	4,25	4,25
The copper price (thousand $ a ton)	8,7	8,5	8,3	8,2	8,2	8,1	8,1	8,2	8,2
The monetary base (trillion Rb)	7,94	8,75	8,20	8,42	8,34	8,55	8,47	8,68	8,60
M2 (trillion Rb)	35,8	35,5	35,7	36,0	36,3	36,6	36,9	37,2	37,5
Gold and foreign exchange reserves (billion $)	0,36	0,37	0,37	0,38	0,38	0,38	0,38	0,39	0,39
The RUR/USD exchange rate (rubles per one USD)	72,88	75,17	75,54	75,27	76,19	76,77	77,34	78,21	78,72
The USD/EUR exchange rate (USD per one Euro)	1,09	1,09	1,09	1,10	1,10	1,10	1,10	1,10	1,10
Real disposable cash income (growth rate, %)*	-0,8	-6,3	-4,3	-2,0	-2,4	-1,8	0,5	-0,4	0,5
Real cash income (growth rate, %)*	-1,4	-6,2	-4,5	-2,3	-2,6	-2,1	0,5	-0,9	0,3
Real accrued wages (growth rate, %)*	-8,4	-6,1	-5,9	-3,3	-9,6	-9,4	-8,4	-7,4	-4,7
Employment (million people)	72,3	72,0	72,1	72,3	72,4	72,9	72,7	73,0	73,2
Unemployment (million people)	4,4	4,6	3,1	4,5	4,4	4,2	4,2	4,3	9,1

Note. Actual values are printed in the bold type
* % of the respective month of the previous year
** % of the previous month.