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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 August 2016 to January 2017, 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

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.

Table 1

CALCULATIONS OF FORECAST VALUES OF INDICES OF INDUSTRIAL PRODUCTION[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																		
Aug 16	0.6	-0.2	1.0	-0.5	-0.6	2.1	1.3	1.7	4.8	1.7	1.9	2.7	-5.9	-2.8	-3.9	-3.0	-2.6	8.1
Sep 16	-0.7	2.3	-0.3	2.1	-2.2	1.1	-0.3	-0.6	5.7	3.6	1.9	2.5	-4.3	-1.2	-7.5	-3.1	-5.3	-0.5
Oct 16	-0.3	1.1	-0.2	0.6	-2.3	0.9	-0.3	1.5	-0.4	-0.7	1.7	2.8	-2.1	2.6	-4.7	-2.1	-9.9	-3.7
Nov 16	0.2	0.4	0.9	-0.1	-0.4	1.6	0.4	0.8	-0.9	-0.1	2.0	3.0	-4.3	0.2	-5.2	0.4	-2.7	0.2
Dec 16	-0.6	1.8	1.5	1.3	0.1	1.8	1.1	0.2	4.9	6.8	2.1	3.6	-6.3	-2.3	-1.8	0.9	-8.0	-3.9
Jan 17	2.3	0.8	-0.1	0.7	1.2	1.0	1.1	-1.2	-1.4	1.1	3.0	2.1	-2.9	1.2	-5.0	1.7	6.6	-0.4
For reference: actual growth in 2015/2016 on the respective month of 2014/2015																		
Aug 15	-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
Sep 15	-3.7		-1.3		0.8	2.8	-5.4	-3.5	-2.6	-2.0	1.4	0.0	-0.5	-3.0	-3.7	-1.6	-9.7	-1.7
Oct 15	-3.6		-2.4		1.4	2.4	-5.9	-5.0	-3.6	-3.1	1.5	0.6	-5.1	-5.8	-6.9	-4.0	-5.9	-7.3
Nov 15	-3.5		-1.7		-0.1	1.7	-5.3	-3.3	-3.5	-2.7	2.4	1.3	-1.8	-3.8	-6.5	-4.0	-5.8	9.5
Dec 15	-4.5		-2.9		0.1	1.3	-6.1	-4.2	-6.3	-6.4	3.1	1.0	1.9	-0.6	-13.3	-6.5	-10.9	-11.7
Jan 16	-2.7		-1.1		0.4	0.8	-5.6	-4.5	2.5	4.6	2.0	3.0	-3.2	-6.8	-6.5	-7.4	2.2	-10.3

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 August 2016 – January 2017, the series of monthly data of the indices of industrial production released by the Federal State Statistics Service (Rosstat) from January 2002 to May 2016, 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 June 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] increment of the index of industrial production computed by the NRU HSE in August 2016 – January 2017 against the same period of the previous year amounts to 0.6% on industry as a whole. For the index of industrial production computed by Rosstat, this indicator constitutes 0.6%. As of end-2016, the forecast annual increment of the index of industrial production computed by Rosstat will amount to 0.1%, and the index of industrial production computed by the NRU HSE – 0.6%.

The average monthly values of the index of industrial production for mining computed by Rosstat and the NRU HSE in August 2016 – January 2017 will come to (-0.7%) and 1.4%, respectively. In production of coke and petroleum products growth is forecast at (-4.3%) and (-0.4%) for Rosstat and the NRU HSE indices, respectively.

In August 2016 – January 2017 in comparison with the same period of last year, the average increment of the NRU HSE index of industrial production in manufacturing comes to 0.4% and the Rosstat index at 0.5%. The average monthly values of the Rosstat and the NRU HSE index for industrial production for food products constitute 2.1% and 2.8%, respectively. The average monthly values of the index of industrial production for primary metals and fabricated metal products in August 2016 – January 2017 computed by Rosstat and the NRU HSE constitute (-4.7%) and (-0.9%), respectively. In manufacture of machinery and equipment, the average increase is forecast at (-3.6%) and 0.0% for the Rosstat and the NRU HSE indices, respectively.

The average increment of the index of industrial production for utilities (electricity, gas and water) computed by Rosstat for August 2016 – January 2017 in comparison with the same period of the previous year constitutes 2.1%; the same indicator for the NRU HSE index comes to 2.1%.

Contraction of indices of industrial production computed by Rosstat across types of economic activity in 2016 ('December-on-December') will average (across types of activity) 1.1%, growth of indices of industrial production computed by the NRU HSE – 1.0%.

Retail Sales

This section (Table 2) presents forecasts of monthly retail sales made on the basis of monthly Rosstat data over January 1999 – June 2016.

Table 2

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

Forecast value according to ARIMA-model		
	Retail sales, billion RUR (in brackets – growth on the respective month of the previous year, %)	Real retail sales (as % of the respective period of the previous year)
Aug 16	2,420.7 (1.9)	92.6
Sep 16	2,370.5 (2.1)	94.0
Oct 16	2,437.8 (2.2)	94.6
Nov 16	2,458.7 (3.0)	95.0
Dec 16	3,104.6 (7.1)	94.1
Jan 17	2,115.4 (-0.5)	94.1
For reference: actual values in the same months of 2014/2015		
Aug 15	2,376.7	90.6
Sep 15	2,322.6	89.3
Oct 15	2,385.2	88.7
Nov 15	2,387.3	87.8
Dec 15	2,898.1	85.9
Jan 16	2,126.2	93.6

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

1 The indices in question are calculated by E.A. Baranov and V.A. Bessonov.

2 The average growth of industrial production indices is understood here as the average value of the said indices for six forecast months.

As seen from *Table 2*, the average forecast increment of nominal volumes of monthly trade turnover amounts to around 2.6% for August 2016 – January 2017 against the corresponding period of 2015–2016.

The average forecast decrease of the monthly real trade turnover for the period from August 2016 – January 2017 against the same period of 2015–2016 constitutes 5.9%.

At an annual rate, forecast growth of the nominal index of retail trade turnover in 2016 will come to 7.1%, and in real terms – decrease by 5.8%.

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 May 2016 on the basis of the data released by the Central Bank of Russia[1]. The results of calculations are shown in Table 3.

The average forecast increment of exports, imports, exports outside the CIS and imports from the countries outside the CIS for August 2016 – January 2017 against the same period of 2015–2016 will amount to 7.2%, 4.4%, 8.3%, and 5.6%, respectively. The average forecast surplus volume of the trade balance with all countries for 2016 will constitute $93.8bn, which corresponds to a decrease by 36.8% 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 April 2016[2]. Table 4 presents the results of model calculations of forecast values over August 2016 and January 2017 in accordance with ARIMA models, structural models (SM) and models computed with the help of business surveys (BS).

The forecast average monthly growth of the consumer price index in August 2016 – January 2017 will come to 0.7%. The price growth of industrial goods for this period is forecast at an average monthly rate of 0.2%. Annual increment of the consumer price index on average across three models will come to 6.9%. The same indicator for the producer price index is forecast at 7.3%.

For the producer price indices computed by Rosstat from August 2016 through January 2017 the following average monthly growth rates are forecast: for mining and quarrying 0.4%, manufacturing 0.6%, utilities (electricity, water, and gas) 0.8%, food products 0.6%, textile and sewing industry 0.6%, wood products 0.4%, pulp and paper industry 0.5%, coke and refined petroleum 1.4%, for chemical industry 0.7%, for basic metals and fabricated metal 0.7%, for machinery and equipment 0.7%, and for transport equipment and manufacturing 0.6%.

Annual increment of the producer price indices across types of economic activity will average 8.5%. By end-2016, maximum annual increment is forecast in the production of basic metals and fabricated metal (16.5%), and the minimum – in the production and supply of electricity, gas and water (1.4%).

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 3

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
Aug 16	23.0	24.8	92	99	16.3	14.5	100	89	18.1	20.1	85	94	14.3	12.4	100	87
Sep 16	23.6	22.7	90	86	15.1	15.7	90	93	20.4	19.0	90	84	14.1	13.6	94	91
Oct 16	22.5	25.6	83	95	16.6	15.9	98	94	21.0	21.6	93	95	14.8	13.8	98	92
Nov 16	21.2	26.3	83	104	16.0	16.8	97	102	19.5	21.1	91	98	14.6	13.0	99	88
Dec 16	23.5	28.4	82	99	16.3	16.0	93	92	20.1	22.4	82	91	14.2	15.0	91	96
Jan 17	18.5	17.5	108	102	9.4	10.6	95	108	15.3	15.0	103	101	9.1	8.7	104	99
For reference: actual values in respective months of 2015/2016 (billion USD)																
Aug 15	25.1				16.3				21.3				14.3			
Sep 15	26.3				16.8				22.6				15.0			
Oct 15	27.0				16.9				22.7				15.0			
Nov 15	25.4				16.5				21.5				14.7			
Dec 15	28.7				17.4				24.5				15.6			
Jan 16	17.1				9.8				14.8				8.8			

Note. Over the period from January 1999 to May 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 4

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)																		
Aug 16	100.4	100.2	100.4	100.3	99.2	101.9	102.7	100.2	102.1	100.8	100.7	100.0	100.6	102.5	101.1	100.9	100.2	100.8
Sep 16	100.6	100.4	100.4	100.3	99.7	101.6	99.4	101.0	100.3	100.4	100.6	100.4	100.5	101.9	100.8	100.7	100.7	100.0
Oct 16	100.8	100.5	100.5	100.8	100.4	100.5	101.1	101.2	100.2	100.4	100.6	100.3	100.6	101.3	100.6	100.8	100.6	101.2
Nov 16	100.9	100.4	100.7	99.5	99.7	100.8	100.7	100.5	100.9	100.5	100.8	100.2	100.1	100.8	100.9	101.0	100.5	100.3
Dec 16	100.9	100.4	100.7	100.2	99.7	99.8	97.9	100.2	100.2	100.8	100.3	100.6	100.5	101.1	100.0	100.9	100.3	100.9
Jan 17	101.5	100.7	101.8	100.3	99.6	100.0	100.6	100.4	101.0	100.7	100.8	100.8	100.6	101.0	100.9	99.8	101.7	100.6
Forecast values (% of December 2015/2016)																		
Aug 16	104.6	104.1	104.1	106.0	105.6	107.0	108.0	104.9	99.8	104.7	107.5	104.4	109.8	106.6	101.9	112.6	108.6	105.2
Sep 16	105.3	104.5	104.6	106.4	105.3	108.7	107.3	105.9	100.1	105.1	108.2	104.8	110.4	108.6	102.8	113.5	109.4	105.2
Oct 16	106.1	105.0	105.1	107.2	105.7	109.3	108.5	107.2	100.3	105.5	108.9	105.1	111.1	110.0	103.4	114.4	110.0	106.5
Nov 16	107.1	105.4	105.8	106.7	105.4	110.1	109.2	107.8	101.2	106.0	109.8	105.3	111.2	110.9	104.3	115.5	110.5	106.8
Dec 16	108.1	105.9	106.6	106.9	105.1	109.9	107.0	108.0	101.4	106.8	110.1	105.9	111.8	112.1	104.4	116.5	110.9	107.8
Jan 17	101.5	100.7	101.8	100.3	99.6	100.0	100.6	100.4	101.0	100.7	100.8	100.8	100.6	101.0	100.9	99.8	101.7	100.6
For reference: actual values in the same periods of 2015/2016 (% of December 2014/2015)																		
Aug 15	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
Sep 15	110.6			112.0			112.7	113.0	105.8	111.2	111.9	109.4	115.7	114.3	118.6	114.3	111.6	116.1
Oct 15	111.4			114.0			120.0	113.5	107.9	112.1	112.9	109.2	116.9	113.3	119.9	114.7	113.0	116.6
Nov 15	112.3			113.2			118.0	112.7	109.2	113.2	113.6	109.3	118.2	108.7	119.5	113.1	113.5	115.9
Dec 15	113.2			110.8			109.8	111.2	109.4	113.9	113.6	109.3	119.0	100.9	118.2	111.9	114.0	116.3
Jan 16	101.0			98.6			95.6	99.4	99.3	100.8	102.0	100.5	101.2	92.6	100.2	99.7	103.3	99.9

Note. Over the period from January 1999 to May 2016, 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 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 August 2016 and January 2017. The forecasts were made based on time series with use the Rosstat data over the period from January 2000 to May 2016. The results are shown in Table 5.

As can be seen from *Table 5*, cost growth of the minimum set of food products is forecast compared to the corresponding period of the previous year. Herewith, forecast cost of the minimum set of food products constitutes around RUR 3,709.5. The forecast cost growth of the minimum set of food products will average around 4.1% compared to the level of the corresponding period of the previous year. Annual increment of the cost of the minimum set of food products in 2016 will constitute 6%.

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 May 2016. Table 6 shows the results of model calculations of forecast values in August 2016 – January 2017. 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.

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 waterborne, 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).

Table 5

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

Forecast values according to ARIMA-model (RUR)	
Aug 16	3,634.3
Sep 16	3,600.7
Oct 16	3,625.7
Nov 16	3,697.5
Dec 16	3,804.0
Jan 17	3,894.4
For reference: actual values in the same months of 2015/2016 (billion RUR)	
Aug 15	3,583.9
Sep 15	3,516.7
Oct 15	3,516.5
Nov 15	3,547.2
Dec 15	3,589.9
Jan 16	3,627.1
Expected growth on the respective month of the previous year (%)	
Aug 16	1.4
Sep 16	2.4
Oct 16	3.1
Nov 16	4.2
Dec 16	6.0
Jan 17	7.4

Note. The series of the cost of the monthly per capita minimum food basket over the period from January 2000 to May 2016 are stationary in the first-order differences.

Table 6

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)			
Aug 16	99.5	100.0	101.3
Sep 16	99.5	100.0	100.6
Oct 16	99.5	100.0	99.5
Nov 16	99.5	100.0	100.3
Dec 16	99.5	100.0	101.1
Jan 17	104.1	101.7	101.9
Forecast values according to ARIMA-models (% of December of the previous year)			
Aug 16	111.6	100.9	108.0
Sep 16	111.1	100.9	109.4
Oct 16	110.5	100.9	110.0
Nov 16	110.0	100.8	109.4
Dec 16	109.4	100.8	109.8
Jan 17	104.1	101.7	101.9
For reference: actual values in the same period of 2015/2016 (% of the previous month)			
Aug 15	100.9	101.8	100.7
Sep 15	100.1	100.5	99.9
Oct 15	94.5	99.6	89.6
Nov 15	100.2	100.2	100.2
Dec 15	100.6	101.9	100.5
Jan 16	100.7	102.2	93.7

Note. Over the period from September 1998 to May 2016, 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 May 2016, too; fictitious variables for taking into account particularly dramatic fluctuations were used in respect of all the series.

According to the forecast results for August 2016 – January 2017, the composite freight rate index will grow on average 0.3% per month. As a result, its annual increment in 2016 will come to 9.4%.

The index of truckload freight rate will be decreasing at a monthly average rate of 0.3% in the course of given six months. Its annual increment is forecast at 0.8% in 2016.

Pipeline transport index will be growing in the course of next six months at a monthly average rate of 0.8%. As a result, its annual increment will amount 9.8% in 2016.

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 August 2016 and January 2017 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 June 2016.

Table 7

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					
Aug 16	48.02	1,604	1,309	4,625	9,083
Sep 16	46.49	1,609	1,319	4,630	9,157
Oct 16	45.00	1,613	1,329	4,640	9,194
Nov 16	42.47	1,606	1,344	4,653	9,198
Dec 16	39.93	1,602	1,356	4,667	9,293
Jan 17	36.81	1,601	1,367	4,684	9,328
Expected growth on the respective month of the previous year (%)					
Aug 15	2.2	3.6	17.1	-9.8	-12.5
Sep 15	-1.6	1.3	17.3	-11.3	-7.9
Oct 15	-6.5	6.4	14.6	-11.0	-10.9
Nov 15	-4.4	9.4	23.8	-3.1	-0.5
Dec 15	5.9	7.0	26.9	0.6	6.7
Jan 16	19.5	8.1	24.6	4.7	9.7
For reference: actual values in the same period of 2015/2016					
Aug 15	46.99	1,548	1,117	5,127	10,386
Sep 15	47.23	1,590	1,125	5,217	9,938
Oct 15	48.12	1,516	1,159	5,216	10,317
Nov 15	44.42	1,468	1,086	4,800	9,244
Dec 15	37.72	1,497	1,068	4,639	8,708
Jan 16	30.8	1,481	1,097	4,472	8,507

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

The average forecast of crude oil price amounts to around $43.1 per barrel, which is above its corresponding year-earlier indices on average by 2.5%. Aluminum prices are forecast at around $1,605.0 per ton and their average forecast increment constitutes around 6.0% compared to the same level last year. Forecast for gold prices constitute around $1,337.0 per ounce. Forecast average copper prices constitute around $4,650 per ton and of nickel prices – about $9,209 per ton. Average forecast price growth on gold constitutes around 21%, average reduction of copper prices – about 5%, average reduction of nickel prices – 3% compared to the corresponding level of last year.

By end-2016, forecast increment of prices on crude oil, aluminum, gold, copper and nickel against end-2015 will come to 5.9%, 7%, 26.9%, 0.6%, and 6.7% respectively.

MONETARY INDICES

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 August 2016 to January 2017 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 July (June – for M_2 time series) 2016. Table 8 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 August 2016 – January 2017, the monetary base will be growing at an average monthly rate of 1.4%, and the monetary indicator M2 – at an average monthly rate of 0.9%. In 2016, annual increment of the indicator M_2 is forecast at the level of 12.2%, and the monetary base – 9.7%.

Table 8

THE FORECAST OF M_2 AND THE MONETARY BASE

	The Monetary base		M_2	
	Billion RUR	Growth on the previous month, %	Billion RUR	Growth on the previous month, %
Aug 16	8,432	-0.5	36,564	0.4
Sep 16	8,530	1.2	36,725	0.4
Oct 16	8,655	1.5	36,887	0.4
Nov 16	8,633	-0.3	37,048	0.4
Dec 16	8,716	1.0	37,367	0.9
Jan 17	9,209	5.7	38,435	2.9
For reference: actual value in the respective months of 2015/2016 (growth on the previous month, %)				
Aug 15	1.0		0.5	
Sep 15	0.6		1.1	
Oct 15	-1.6		-0.2	
Nov 15	0.2		-0.3	
Dec 15	-0.1		1.4	
Jan 16	10.1		7.5	

Note. Over the period from October 1998 to July (June) 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.

INTERNATIONAL RESERVES

This section presents the outputs of the statistical estimation of such future values of the international reserves of the Russian Federation[2] 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 June 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.

Table 9

THE FORECAST OF THE INTERNATIONAL RESERVES OF THE RUSSIAN FEDERATION

	Forecast values according to ARIMA-model	
	Billion USD	Growth on the previous month, %
Aug 16	386.1	-0.1
Sep 16	386.3	0.1
Oct 16	388.3	0.5
Nov 16	390.1	0.5
Dec 16	391.7	0.4
Jan 17	393.2	0.4
For reference: actual values in the same period of 2015/2016		
Aug 15	357.6	-1.1
Sep 15	366.3	2.4
Oct 15	371.3	1.3
Nov 15	369.6	-0.4
Dec 15	364.7	-1.3
Jan 16	368.4	1.0

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

Subsequent to the forecast results in August 2016 – January 2017, the international reserves will be growing by an average monthly rate of 0.3%. As a result, annual increment of the international reserves in 2016 will come to 7.4%.

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.

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

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 July 2016 and from January 1999 to July 2016[1], respectively.

USD/RUR average exchange rate in the intervening period is forecast on average along two models in the amount of RUR 67.93 for USD. Forecast by end-2016 average (along two models) indicator will total Rb 69.35 for USD.

Euro/USD average exchange rate is forecast at USD 1.11 per 1 euro. By end-2016, the indicator is forecast at USD 1.10 per 1 euro along two models.

Table 10

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

	The USD/RUR exchange rate (RUR per USD)		The EUR/USD exchange rate (USD per EUR)	
	ARIMA	SM	ARIMA	SM
Aug 16	66.25	66.31	1.11	1.12
Sep 16	67.19	67.43	1.11	1.11
Oct 16	67.45	67.83	1.11	1.11
Nov 16	67.83	68.62	1.11	1.11
Dec 16	68.19	69.33	1.11	1.10
Jan 17	68.55	70.15	1.11	1.10
For reference: actual values in the similar period of 2015/2016				
Aug 15	66.48		1.11	
Sep 15	66.24		1.12	
Oct 15	64.37		1.10	
Nov 15	66.24		1.05	
Dec 15	72.88		1.09	
Jan 16	75.17		1.09	

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

THE LIVING STANDARD INDICES

This section (Table 12) presents calculations of forecast values of indices of real wages, real disposable income and real income [2] 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 June 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 11*, the forecast average monthly fall of the real disposable money income will constitute 1.6% per month compared to the same period of last year; the real

Table 11

THE FORECAST OF THE LIVING STANDARD INDICES

	Real disposable money income	Real money income	Real accrued wages
Forecast values according to ARIMA-models (% of the respective month of 2015/2016)			
Aug 16	96.9	97.0	105.6
Sep 16	98.3	98.7	104.3
Oct 16	97.7	97.8	102.8
Nov 16	98.5	98.4	103.7
Dec 16	99.1	99.1	100.6
Jan 17	100.0	100.1	101.7
For reference: actual values in the respective period of 2015/2016 (% of the same period of 2014/2015)			
Aug 15	94.7	93.9	91.0
Sep 15	93.9	93.8	89.6
Oct 15	93.2	93.2	89.5
Nov 15	93.7	93.5	89.6
Dec 15	99.1	98.5	91.6
Jan 16	94.3	94.3	96.4

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 June 2016 those series were attributed to the class of processes which are stationary in differences and have an explicit seasonal component.

1 The authors use the IMF data over the period from January 1999 to May 2016. The data over the period from June and July 2016 was obtained from the foreign exchange rate statistics website: www.oanda.com

2 *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).

money income – 1.5%. The average monthly growth of the real accrued wages is forecast in the amount of 3.1% in comparison with the same period of the previous year.

By end-2016, forecast decrease of the real disposable money income will amount to 3.3%; the real money income – by 3.4%, and increment of the level of the real wages – 1.3%.

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 May 2016 on the basis of the monthly data released by Rosstat[1] were used. The unemployment was calculated on the basis of the models with results of the findings from business surveys,[2] too.

It is to be noted that feasible logical inconsistencies[3] 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.

Table 12

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

	Employment (ARIMA)		Unemployment (ARIMA)			Unemployment (BS)		
	Million people	Growth on the respective month of previous year (%)	Million people	Growth on the respective month of previous year (%)	% of the index of the number of the gainfully employed population	Million people	Growth on the respective month of previous year (%)	% of the index of the number of the gainfully employed population
Aug 16	72.8	-0.6	4.2	3.5	5.8	4.3	4.0	5.9
Sep 16	72.6	-0.4	4.3	7.0	5.9	4.3	6.7	5.9
Oct 16	72.3	-0.2	4.4	2.5	6.1	4.4	2.6	6.1
Nov 16	72.2	-0.1	4.5	2.0	6.2	4.5	1.8	6.2
Dec 16	72.0	-0.4	4.6	4.2	6.4	4.5	2.1	6.3
Jan 17	71.6	0.5	4.8	8.1	6.6	4.6	2.8	6.4
For reference: actual values in the same periods of 2015/2016 (million people)								
Aug 15	73.3		4.1					
Sep 15	72.9		4,0					
Oct 15	72.5		4.3					
Nov 15	72.2		4.4					
Dec 15	72.3		4.4					
Jan 16	71.3		4.4					

Note. Over the period from October 1998 to May 2016 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 12*), in August 2016 – January 2017, the decrease of the number of employed in the economy on average will constitute 0.2% per month against the corresponding period of the previous year. Forecast by end-2016 indicator of the number of employed in the economy constitutes 72.0 mn persons.

The average increase of the total number of jobless is forecast at 3.9% per month against the corresponding period last year. Average number of jobless by end-2016 is forecast at 4.6 mn persons.

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

2 The model is evaluated over the period from January 1999 to May 2016

3 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.

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)

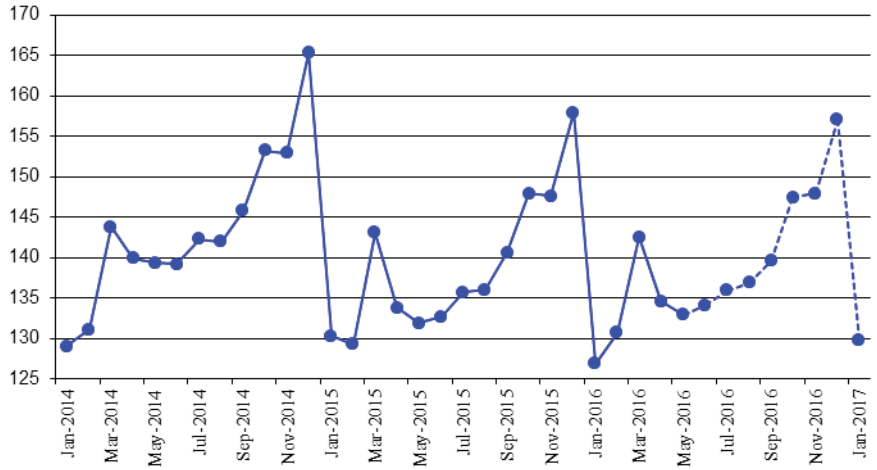


Fig. 1b. The NRU HSE industrial production index (ARIMA-model) (% of January 2005)

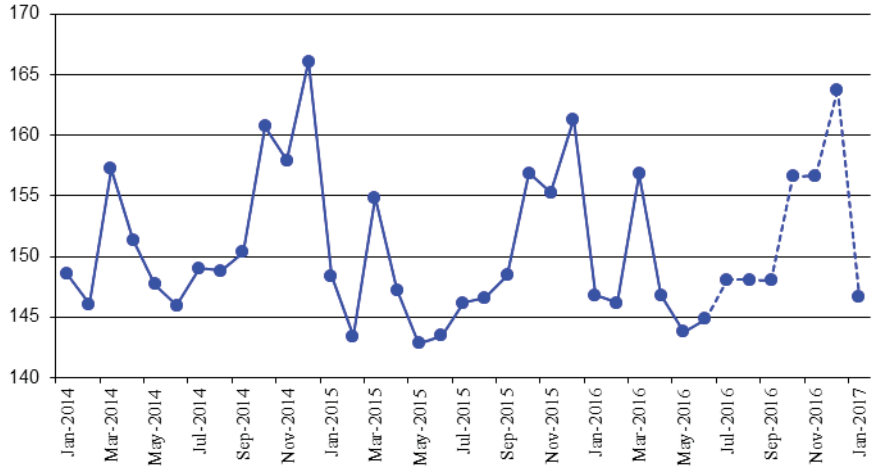


Fig. 2a. The Rosstat industrial production index for mining (% of December 2001)

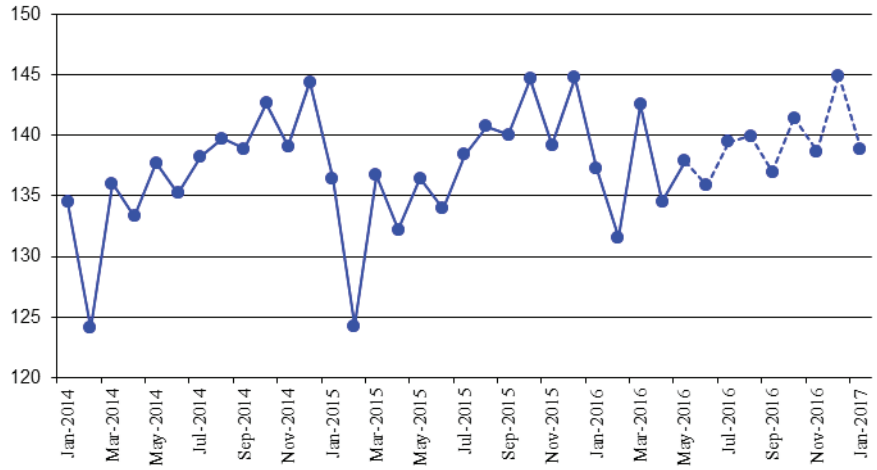


Fig. 2b. The NRU HSE industrial production index for mining (% of January 2005)

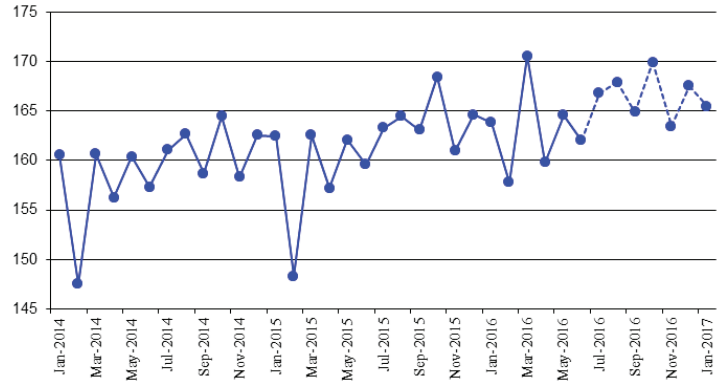


Fig. 3a. The Rosstat industrial production index for manufacturing (% of December 2001)

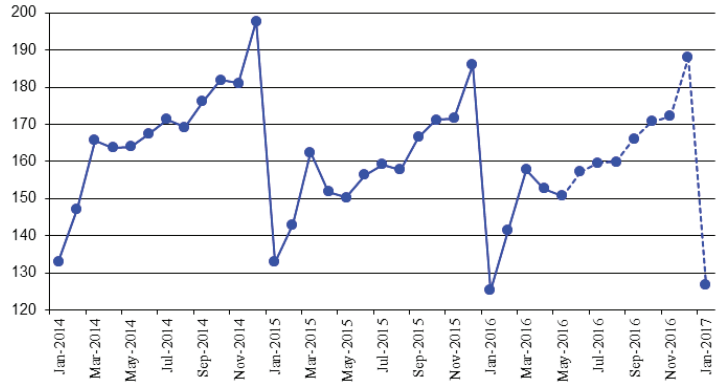


Fig. 3b. The NRU HSE industrial production index for manufacturing (% of January 2005)

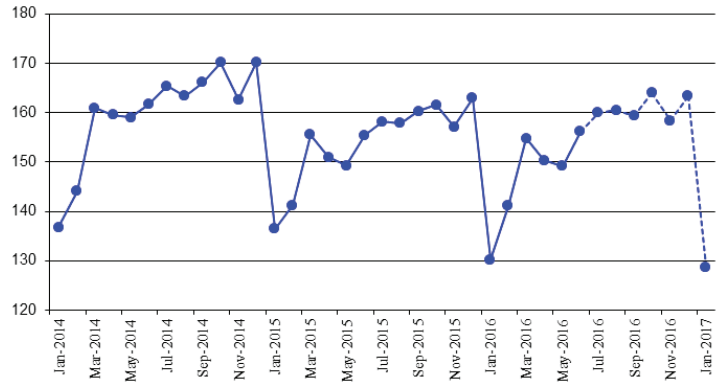


Fig. 4a. The Rosstat industrial production index for utilities (electricity, water, and gas) (as a percentage of that in December 2001)

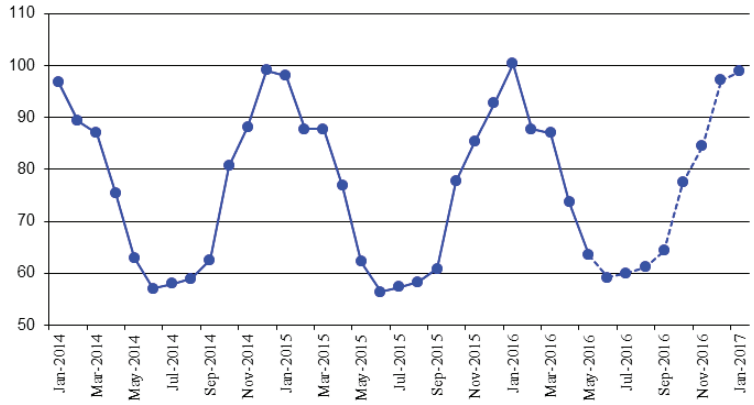


Fig. 4b. The NRU HSE industrial production index for utilities (electricity, water, and gas) (as a percentage of that in January 2005)

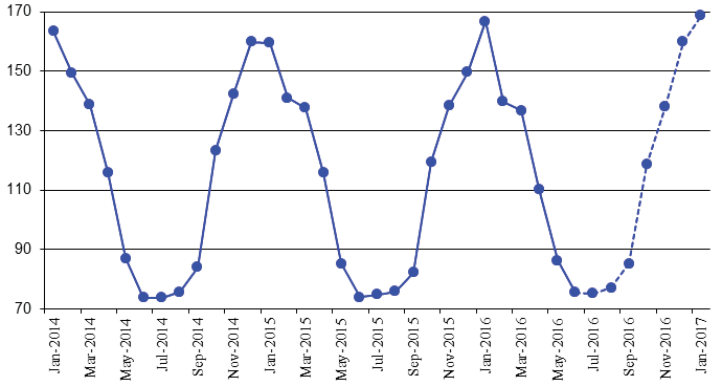


Fig. 5a. The Rosstat industrial production index for food products (as a percentage of that in December 2001)

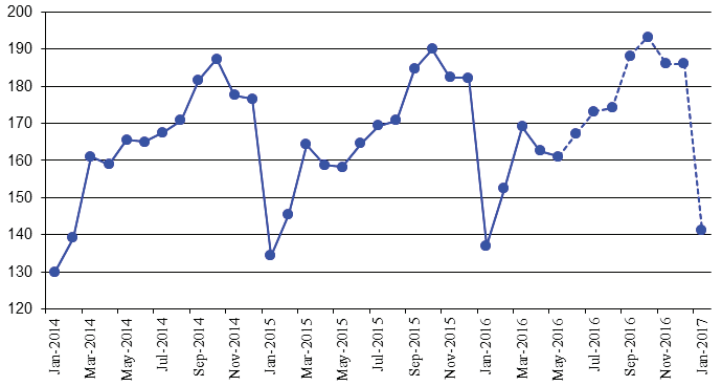


Fig. 5b. The NRU HSE industrial production index for food products (as a percentage of that in January 2005)

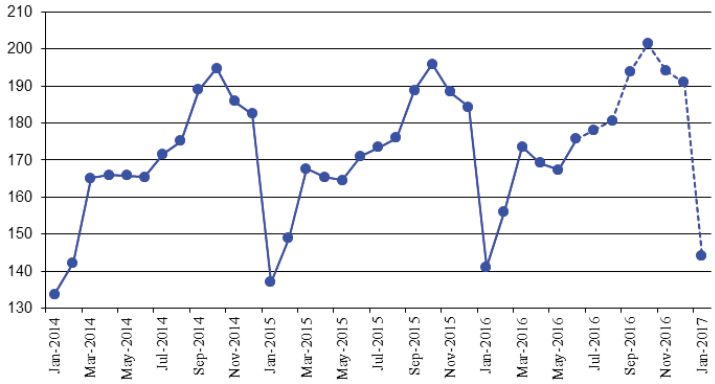


Fig. 6a. The Rosstat industrial production index for coke and petroleum (as a percentage of that in December 2001)

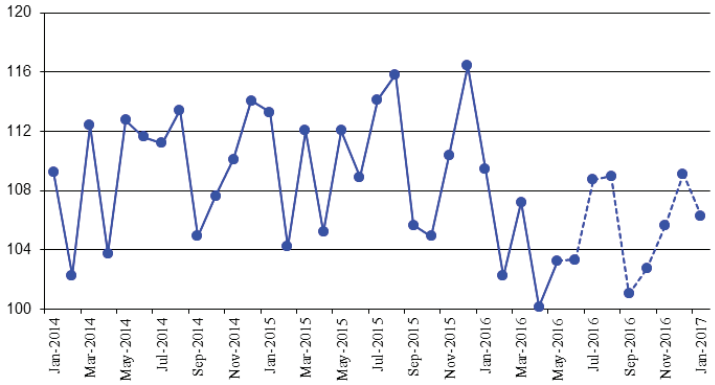


Fig. 6b. The NRU HSE industrial production index for petroleum and coke (as a percentage of that in January 2005)

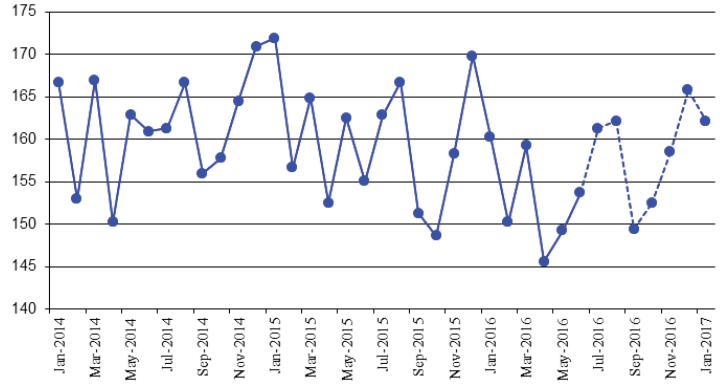


Fig.7a. The Rosstat industrial production index for primary metals and fabricated metal products (as a percentage of that in December 2001)

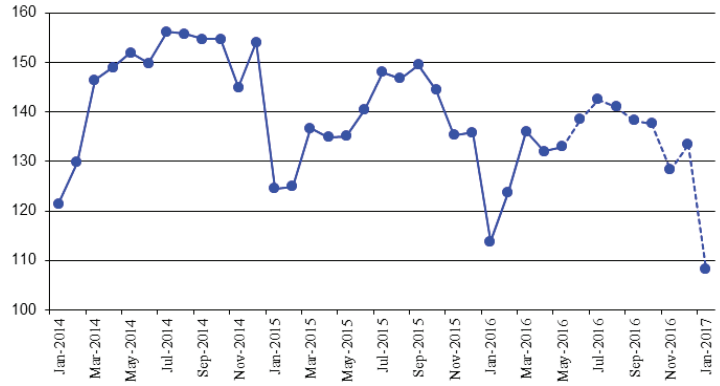


Fig. 7b. The NRU HSE industrial production index for primary metals and fabricated metal products (as a percentage of that in January 2005)

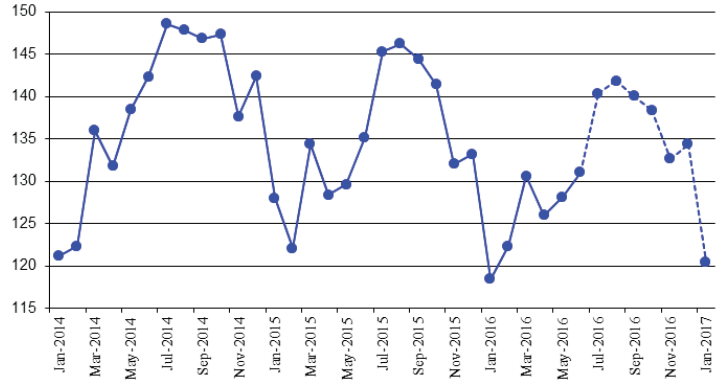


Fig. 8a. The Rosstat industrial production index for machinery (as a percentage of that in December 2001)

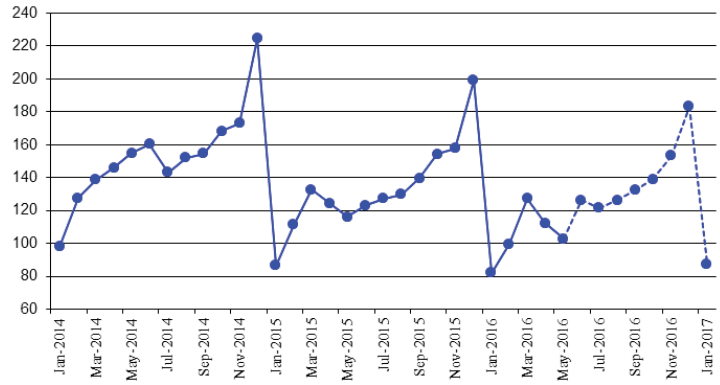


Fig. 8b. The NRU HSE industrial production index for machinery (as a percentage of that in January 2005)

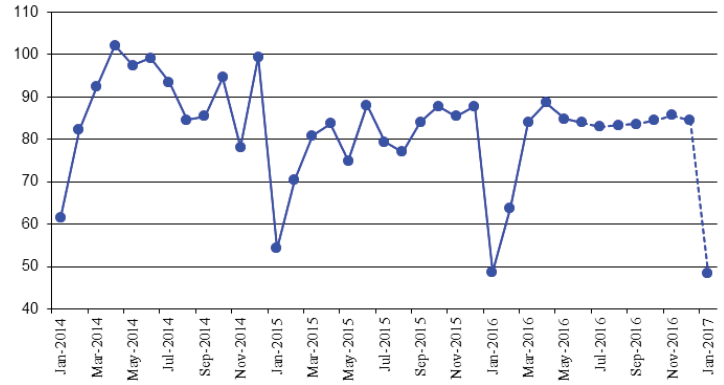


Fig. 9. The volume of retail sales (billion RUR)

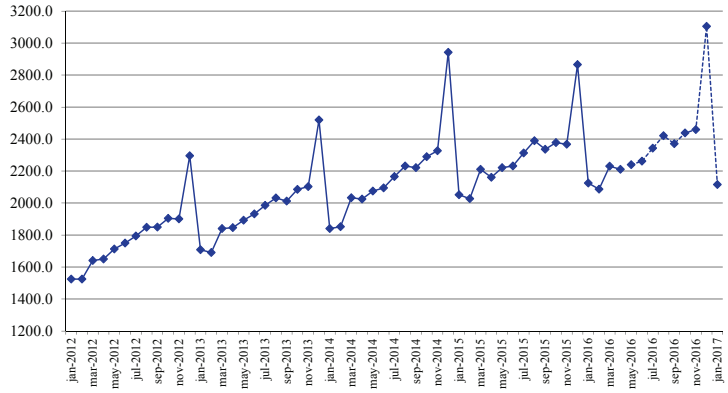


Fig. 9a. The real volume of retail sales (as a percentage of that in the same period of the previous year)

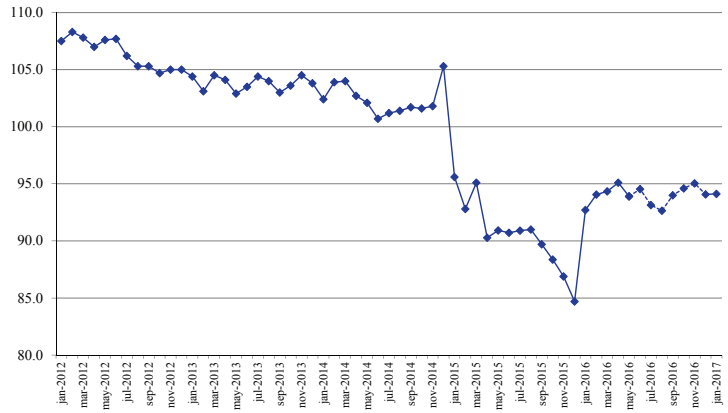


Fig.10. Export to all countries (billion USD)

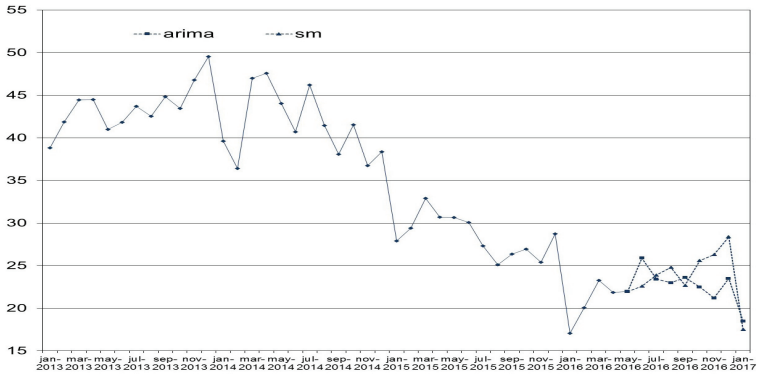


Fig. 11. Export to countries outside the CIS (billion USD)

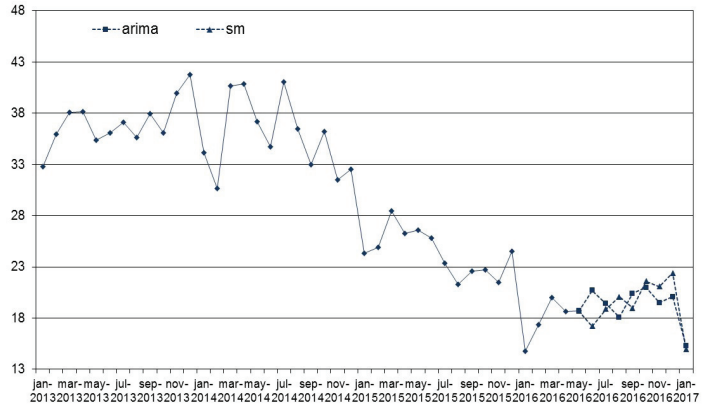


Fig. 12. Import from all countries (billion USD)

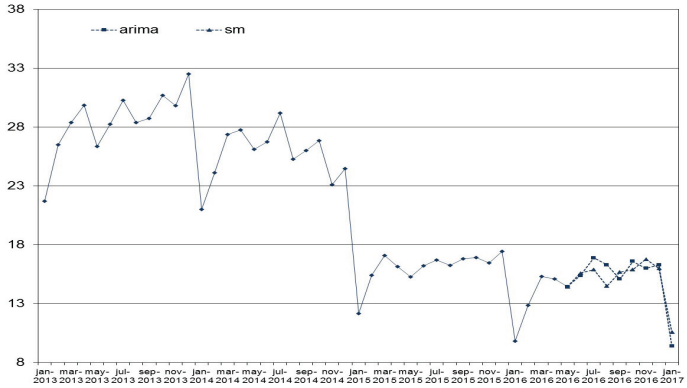


Fig. 13. Import from countries outside the CIS (billion USD)

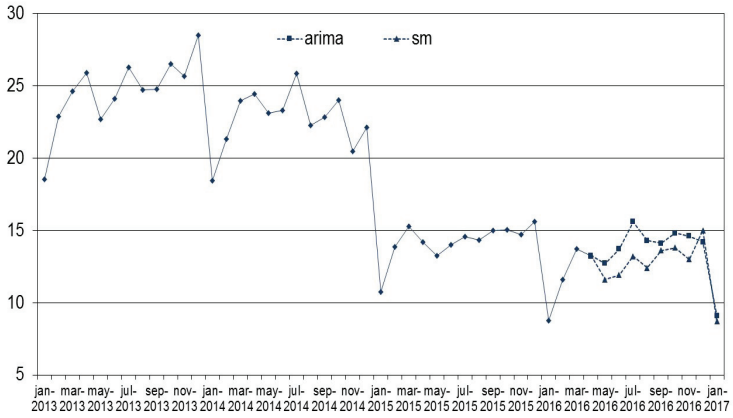


Fig. 14. The consumer price index
(as a percentage of that in December of the previous year)

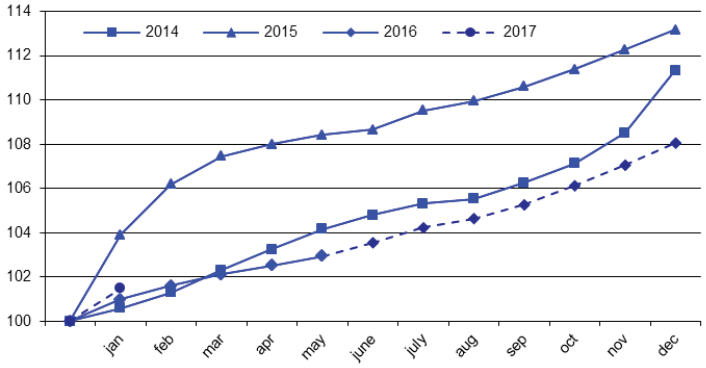


Fig. 14a. The consumer price index
(as a percentage of that in December of the previous year) (SM)

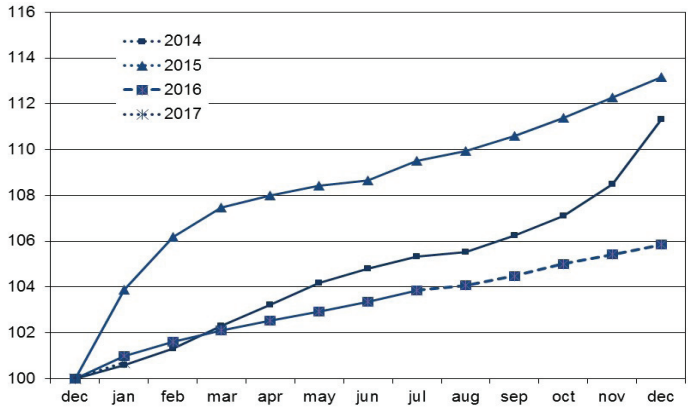


Fig.15. The producer price index for industrial goods
(as a percentage of that in December of the previous year)

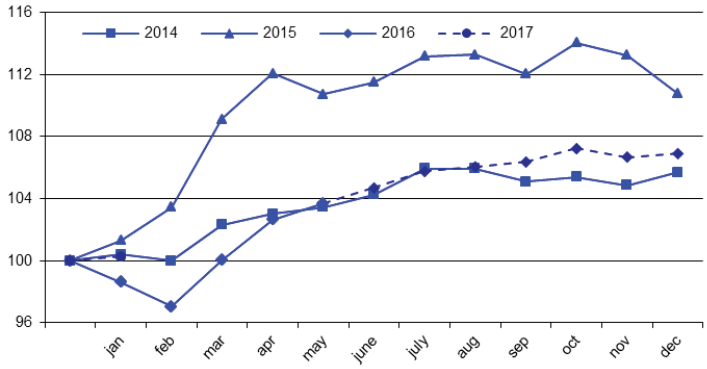


Fig. 16. The price index for mining
(as a percentage of that in December of the previous year)

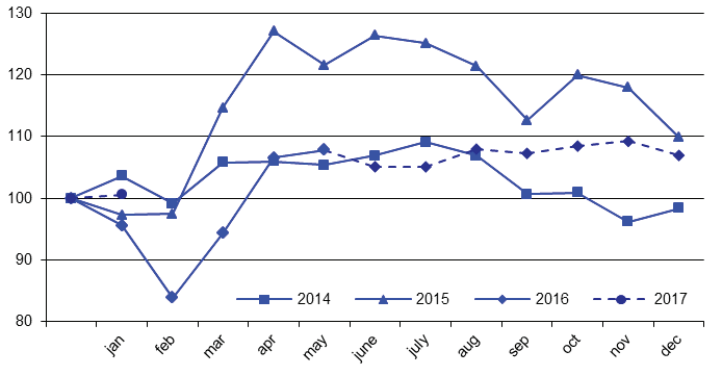


Fig. 17. The price index for manufacturing
(as a percentage of that in December of the previous year)

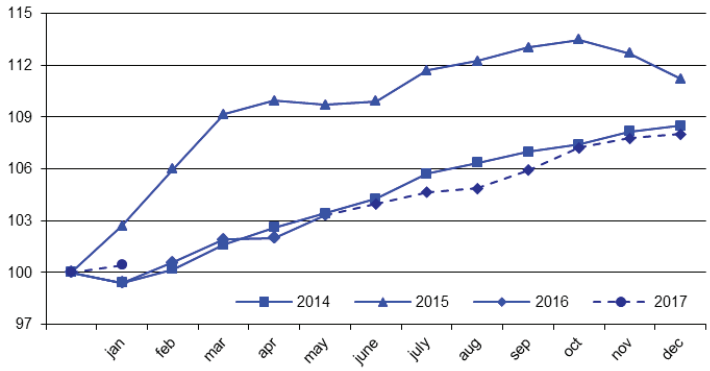


Fig. 18. The price index for utilities (electricity. water. and gas)
(as a percentage of that in December of the previous year)

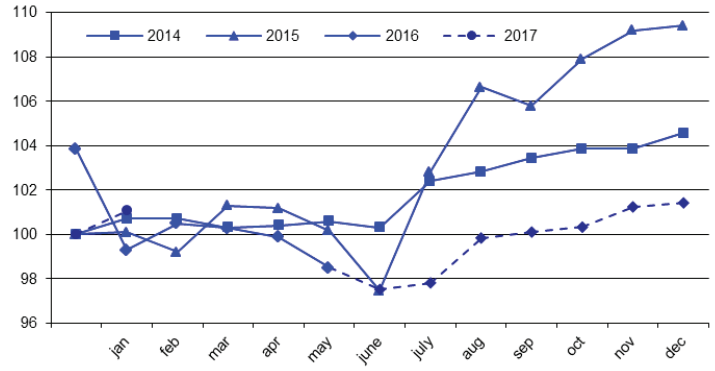


Fig. 19. The price index for food products
(as a percentage of that in December of the previous year)

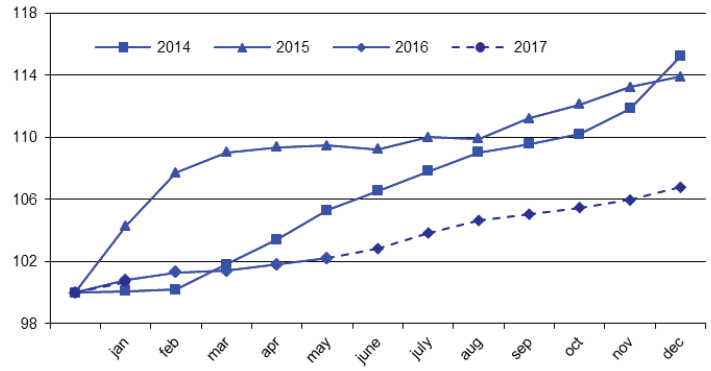


Fig. 20. The price index for the textile and sewing industry
(as a percentage of that in December of the previous year)

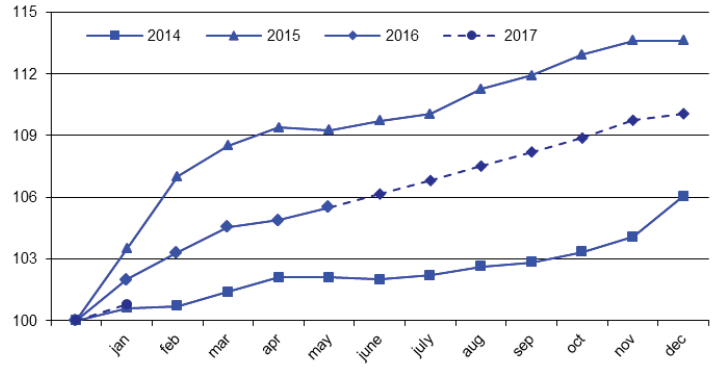


Fig. 21. The price index for wood products
(as a percentage of that in December of the previous year)

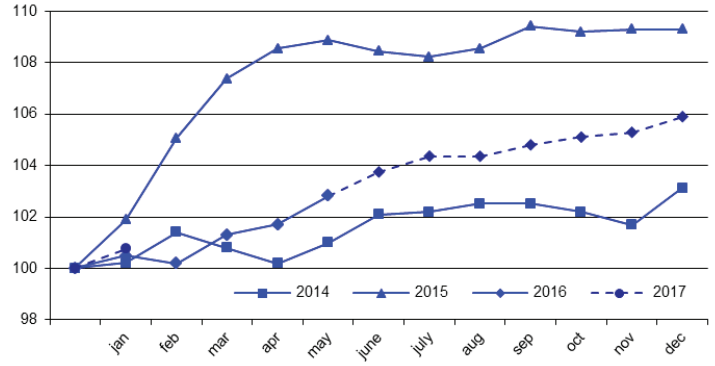


Fig. 22. The price index for the pulp and paper industry
(as a percentage of that in December of the previous year)

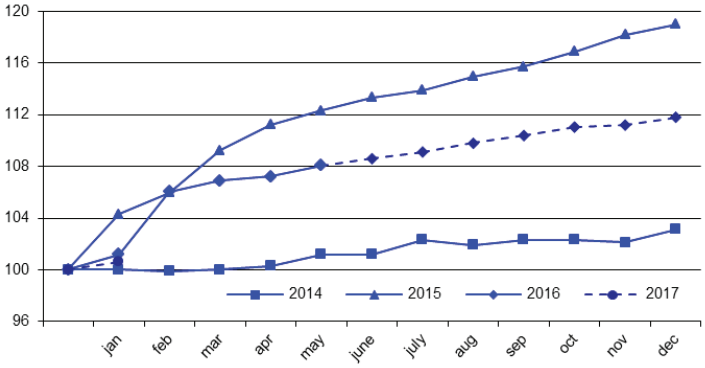


Fig. 23. The price index for coke and petroleum
(as a percentage of that in December of the previous year)

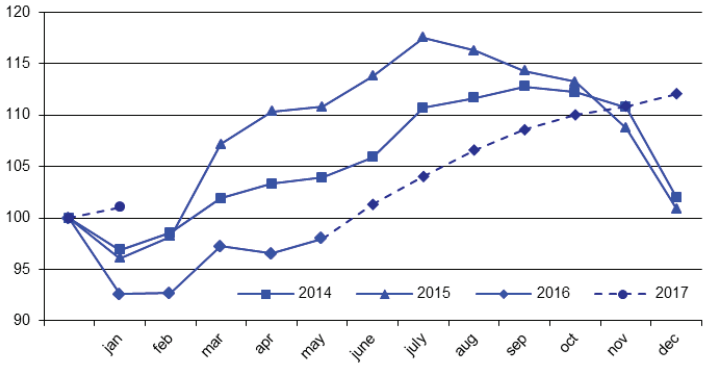


Fig. 24. The price index for the chemical industry
(as a percentage of that in December of the previous year)

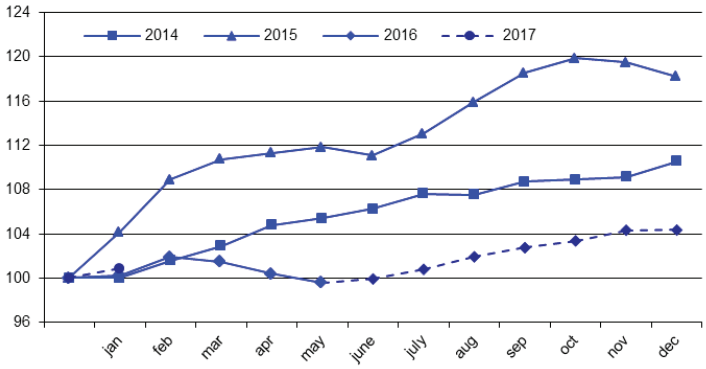


Fig.25. The price index for primary metals and fabricated metal products
(as a percentage of that in December of the previous year)

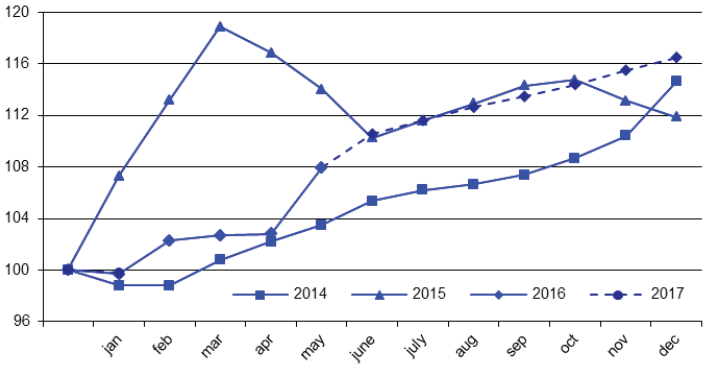


Fig.26. The price index for machinery
(as a percentage of that in December of the previous year)

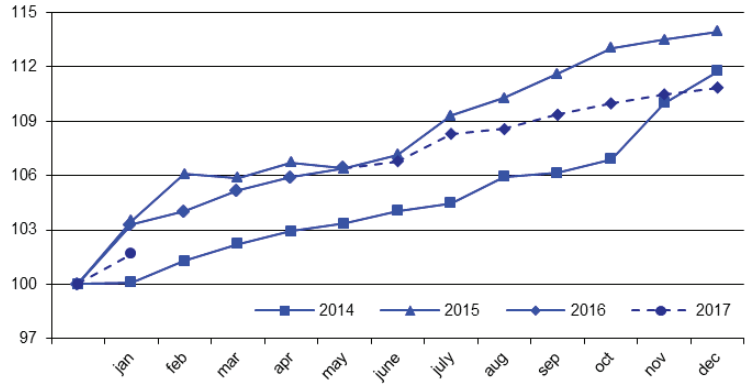


Fig.27. The price index for transport equipment manufacturing
(as a percentage of that in December of the previous year)

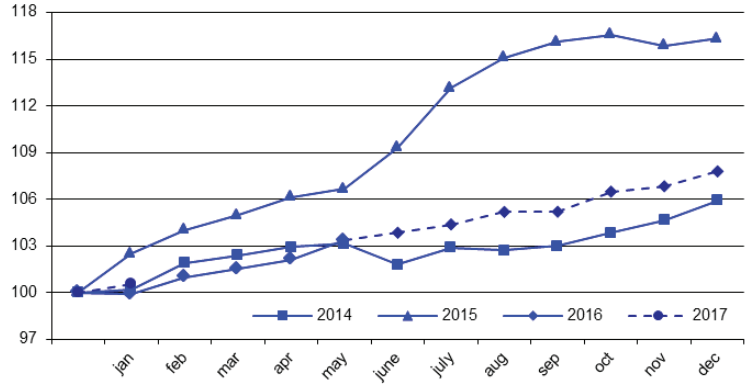


Fig. 28. The cost of the monthly per capita minimum food basket (RUR)

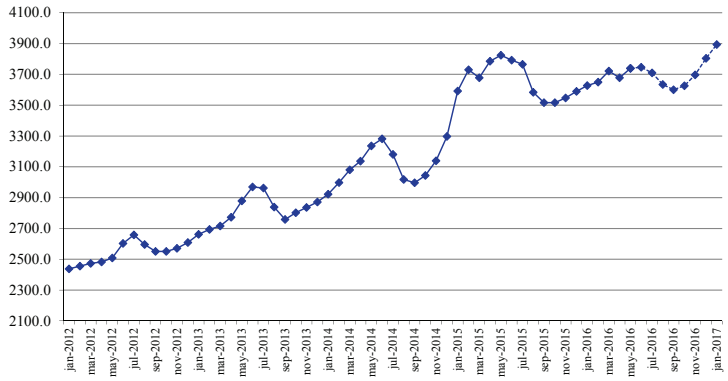


Fig. 29. The composite index of transport tariffs
(for each year, as a percentage of that in the previous month)

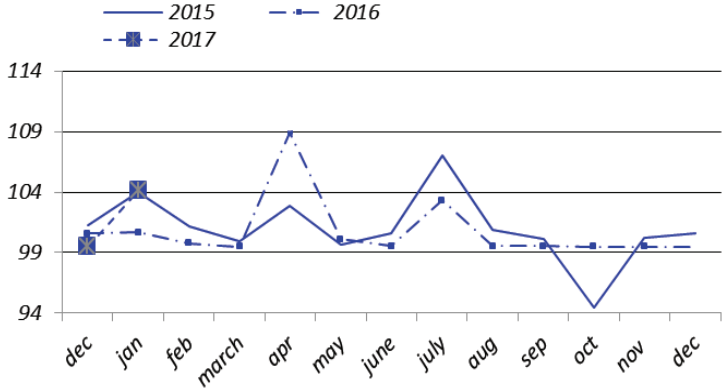


Fig. 30. The index of motor freight tariffs
(for each year, as a percentage of that in the previous month)

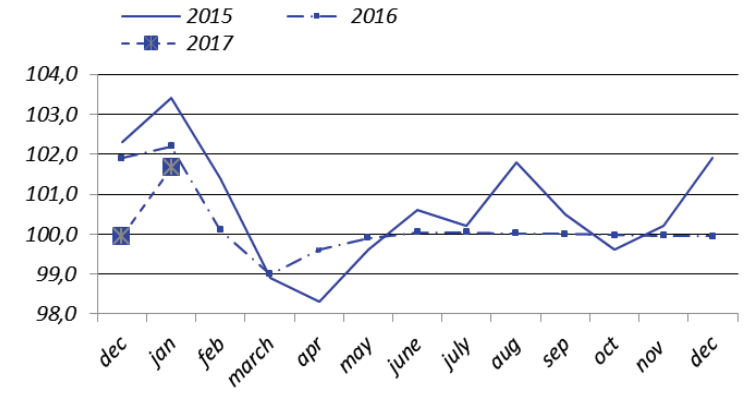


Fig. 31. The index of pipeline tariffs
(for each year, as a percentage of that in the previous month)

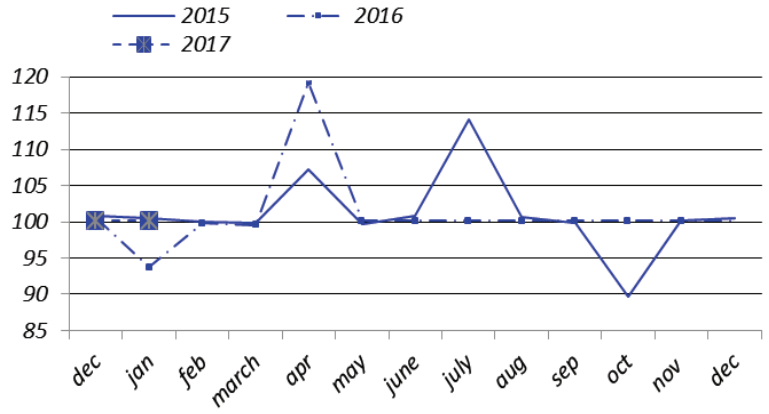


Fig. 32. The Brent oil price ($ per barrel)

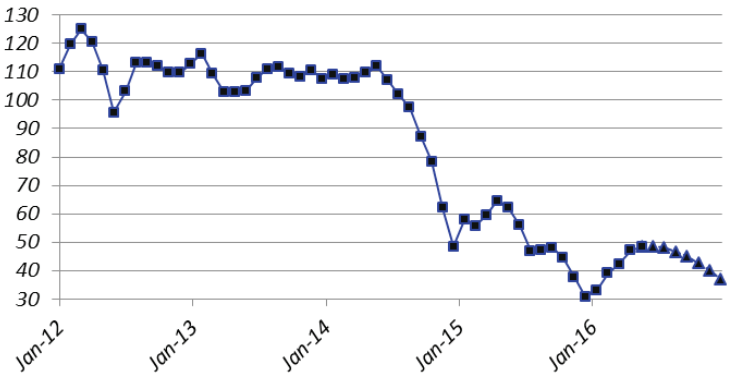


Fig. 33. The aluminum price ($ per ton)

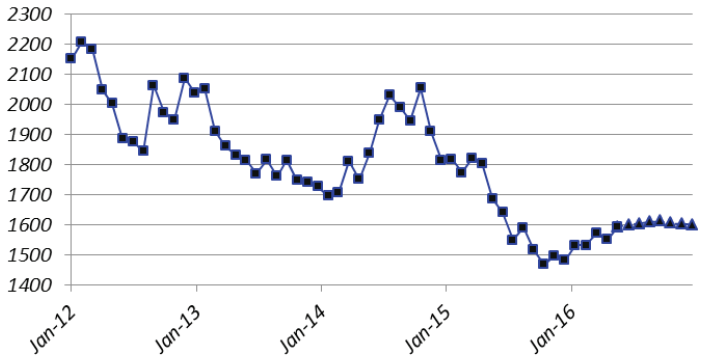


Fig. 34. The gold price ($ per ounce)

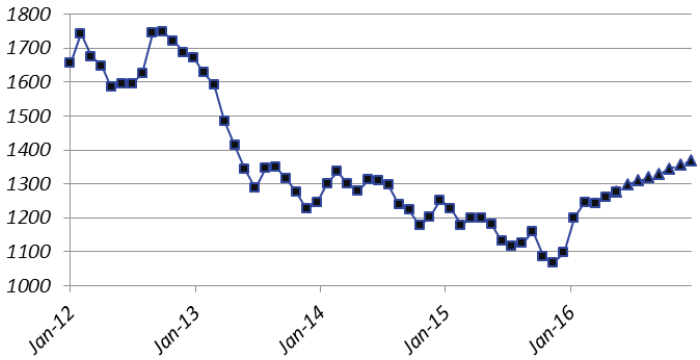


Fig. 35. The nickel price ($ per ton)

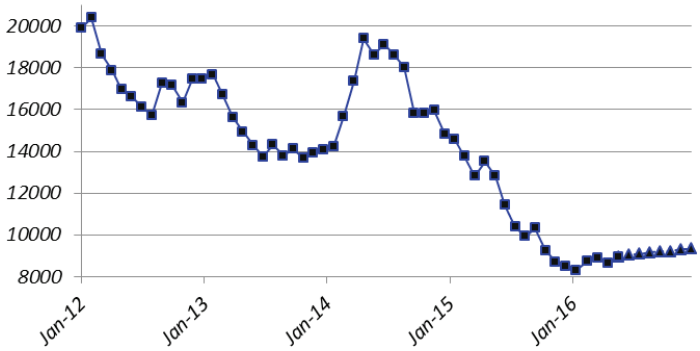


Fig. 36. The copper price ($ per ton)

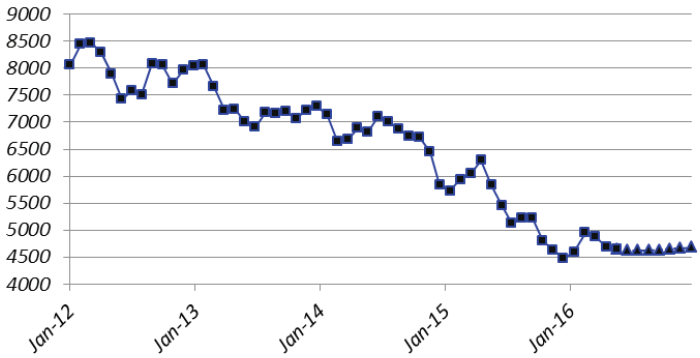


Fig. 37. The monetary base, billion RUR

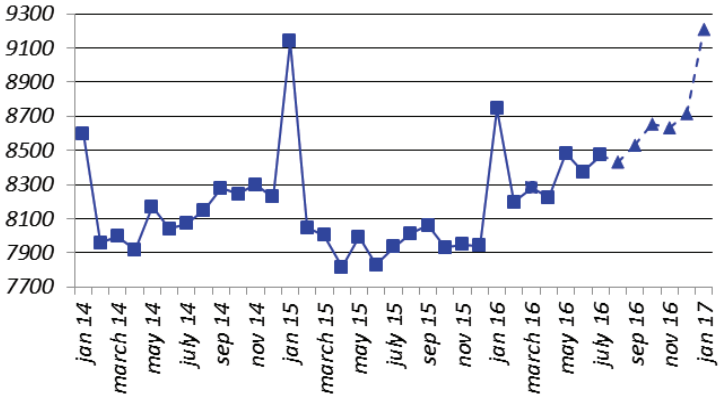


Fig. 38. M_2, billion RUR

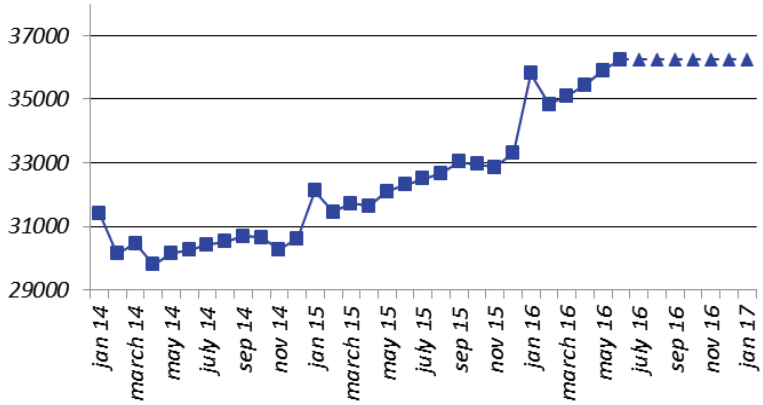


Fig. 39. The international reserves of the Russian Federation, million USD

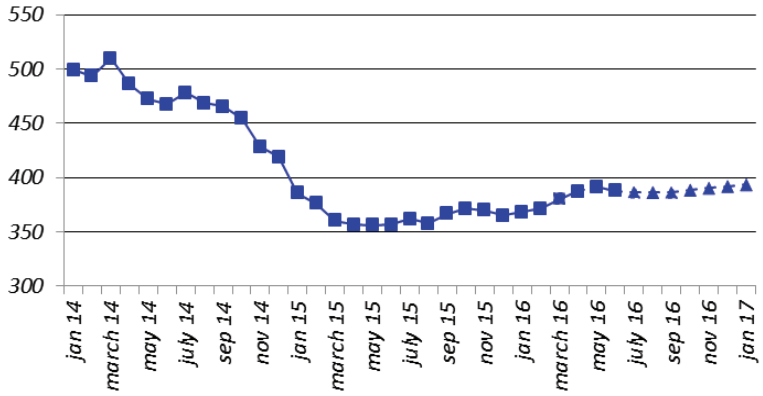


Fig. 40. The RUR/USD exchange rate

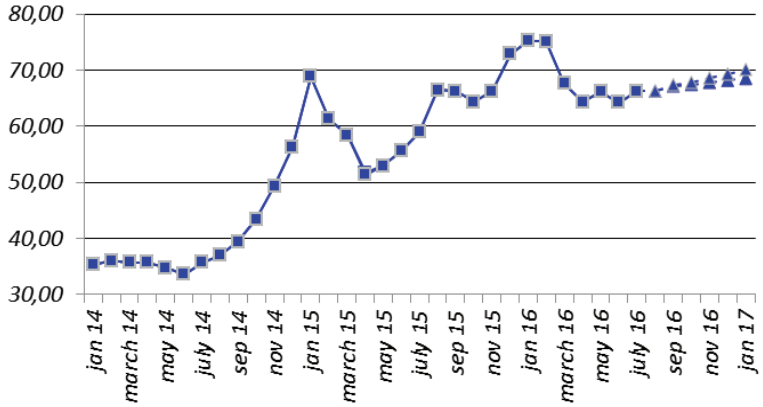


Fig. 41. The USD/EUR exchange rate

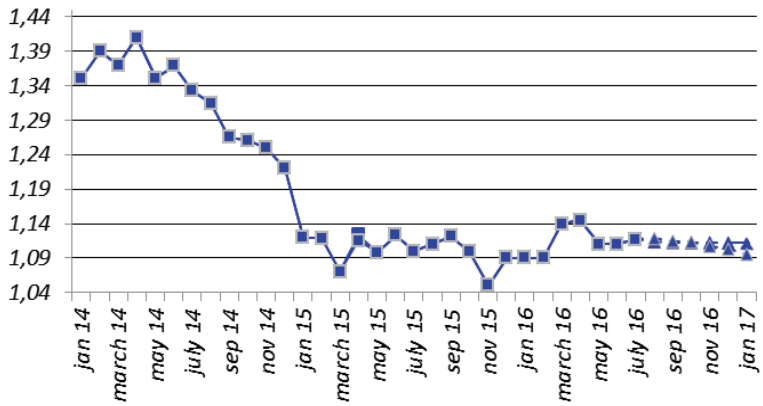


Fig. 42. Real disposable cash income
(as a percentage of that in the same period of the previous year)

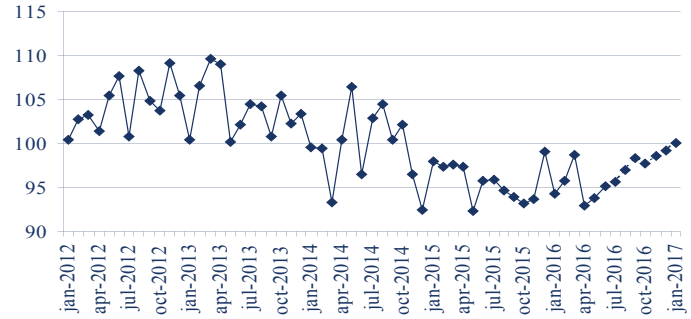


Fig. 43. Real cash income
(as a percentage of that in the same period of the previous year)

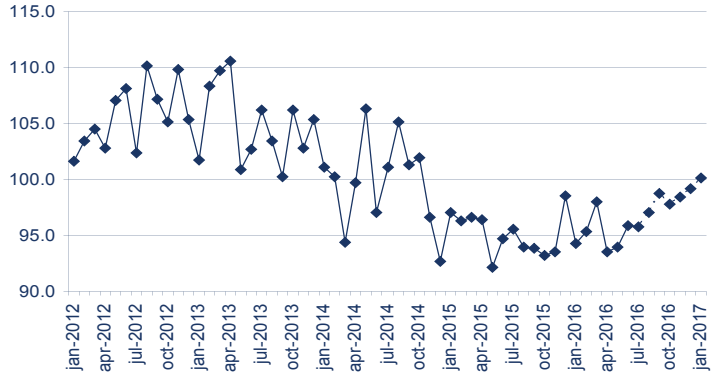


Fig. 44. Real accrued wages
(as a percentage of those in the same period of the previous year)

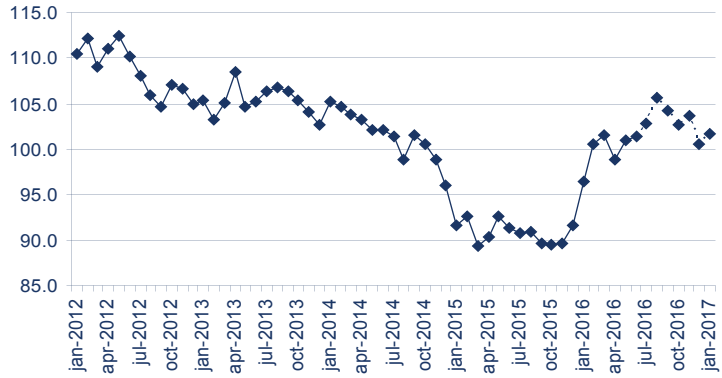


Fig. 45. Employment (million people)

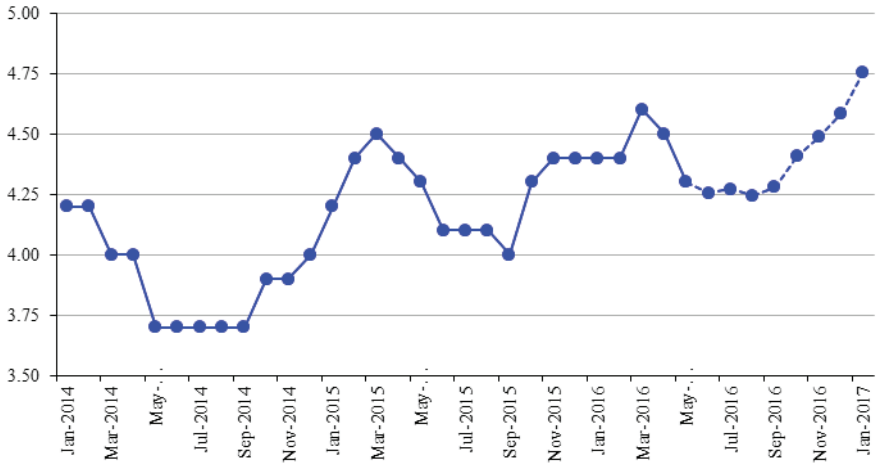
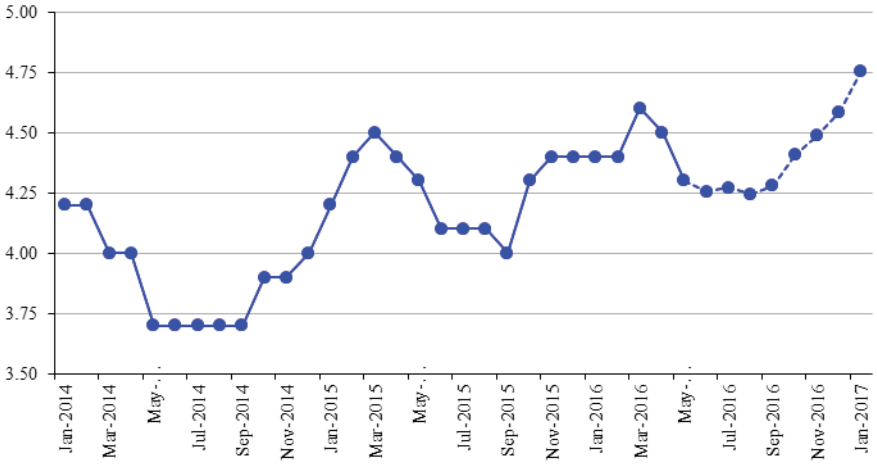


Fig. 46. Unemployment (million people)



MODEL CALCULATIONS OF SHORT-TERM FORECASTS OF SOCIAL AND ECONOMIC INDICES OF THE RUSSIAN FEDERATION: JULY 2016

Index	2016								2017
	May	June	July	August	September	October	November	December	January
Rosstat IIIP (growth rate, %)*	**0.7**	1.1	0.0	1.5	0.2	0.1	1.0	0.1	2.2
HSE IIP (growth rate %)*	**0.7**	**1.0**	0.4	1.6	0.2	-0.2	1.1	1.1	0.7
Rosstat IIP for mining (growth rate, %)*	**1.5**	1.4	0.8	-0.6	-2.2	-2.3	-0.4	0.1	1.2
HSE IIP for mining (growth rate, %)*	**1.5**	**1.5**	2.1	2.1	1.1	0.9	1.6	1.8	1.0
Rosstat IIIP for manufacturing (growth rate, %)*	**0.3**	0.5	0.3	1.3	-0.3	-0.3	0.4	1.1	1.1
HSE IIP for manufacturing (growth rate, %)*	**0.0**	**0.5**	1.1	1.7	-0.6	1.5	0.8	0.2	-1.2
Rosstat IIP for utilities (electricity, water, and gas) (growth rate, %)*	**2.1**	4.8	4.6	4.8	5.7	-0.4	-0.9	4.9	-1.4
HSE for utilities (electricity, water, and gas) (growth rate, %)*	**1.4**	**2.1**	0.5	1.7	3.6	-0.7	-0.1	6.8	1.1
Rosstat IIP for food products (growth rate, %)*	**2.1**	1.7	2.3	1.9	1.9	1.7	2.0	2.1	3.0
HSE IIP for food products (growth rate, %)*	**1.7**	**2.7**	2.7	2.7	2.5	2.8	3.0	3.6	2.1
Rosstat IIP for coke and petroleum (growth rate, %)*	**-6.8**	-5.1	-4.7	-5.9	-4.3	-2.1	-4.3	-6.3	-2.9
HSE for coke and petroleum (growth rate, %)*	**-8.2**	**-0.9**	-0.9	-2.8	-1.2	2.6	0.2	-2.3	1.2
Rosstat for primary metals and fabricated metal products (growth rate, %)*	**0.2**	-1.4	-3.7	-3.9	-7.5	-4.7	-5.2	-1.8	-5.0
HSE IIP for primary metals and fabricated metal products (growth rate, %)*	**-1.2**	**-3.0**	-3.4	-3.0	-3.1	-2.1	0.4	0.9	1.7
Rosstat IIP for machinery (growth rate, %)*	**-11.9**	2.7	-4.3	-2.6	-5.3	-9.9	-2.7	-8.0	6.6
HSE IIP for machinery (growth rate %)*	**13.1**	**-4.6**	4.4	8.1	-0.5	-3.7	0.2	-3.9	-0.4
Retail sales, trillion Rb	**2.24**	2.26	2.34	2.42	2.37	2.44	2.46	3.10	2.12
Real retail sales (growth rate, %)*	**-6.10**	-5.46	-6.86	-7.36	-6.00	-5.40	-4.96	-5.92	-5.88
Investments in capital assets, trillion Rb	**22.0**	24.3	23.7	23.9	23.2	24.1	23.8	26.0	18.0
Real investments in capital assets (growth rate, %)*	**18.7**	19.0	19.2	19.1	19.7	21.3	20.3	21.3	15.2
Export to all countries (billion $)	**14.4**	15.5	16.4	15.4	15.4	16.3	16.4	16.2	10.0
Export to countries outside the CIS (billion $)	**13.3**	12.2	12.8	14.4	13.4	13.9	14.3	13.8	14.6
Import from all countries (billion $)	**0.4**	**0.4**	0.6	0.3	0.5	0.6	0.7	0.7	1.3
Import from countries outside the CIS (billion $)	**1.0**	0.8	0.9	0.5	0.5	0.6	0.0	-0.1	0.0
CPI (growth rate, %)**	**1.2**	-2.5	0.0	2.7	-0.6	1.1	0.7	-2.1	0.6
PPI for industrial goods (growth rate, %)**	**1.3**	0.6	0.7	0.2	1.0	1.2	0.5	0.2	0.4
PPI for mining (growth rate, %)**	**-1.4**	-1.0	0.3	2.1	0.3	0.2	0.9	0.2	1.0
PPI for manufacturing (growth rate, %)**	**0.4**	0.6	1.0	0.8	0.4	0.4	0.5	0.8	0.7
PPI for utilities (electricity, water, and gas) (growth rate, %)**	**0.6**	0.6	0.6	0.7	0.6	0.6	0.8	0.3	0.8
PPI for food products (growth rate, %)**	**1.1**	0.9	0.6	0.0	0.4	0.3	0.2	0.6	0.8
PPI for the textile and sewing industry (growth rate, %)**	**0.8**	0.5	0.5	0.6	0.5	0.6	0.1	0.5	0.6
PPI for wood products (growth rate, %)**	**1.5**	3.4	2.7	2.5	1.9	1.3	0.8	1.1	1.0
PPI for the pulp and paper industry (growth rate, %)**	**-0.8**	0.4	0.9	1.1	0.8	0.6	0.9	0.0	0.9
PPI for coke and petroleum (growth rate, %)**	**5.0**	2.4	1.0	0.9	0.7	0.8	1.0	0.9	-0.2
PPI for the chemical industry (growth rate, %)**	**0.5**	0.3	1.4	0.2	0.7	0.6	0.5	0.3	1.7

Index	2016								2017
	May	June	July	August	September	October	November	December	January
PPI for primary metals and fabricated metal products (growth rate, %)**	**1.2**	0.5	0.5	0.8	0.0	1.2	0.3	0.9	0.6
PPI for machinery (growth rate, %)**	**3.74**	3.75	3.71	3.63	3.60	3.63	3.70	3.80	3.89
PPI for transport equipment manufacturing (growth rate, %)**	**-0.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
The cost of the monthly per capita minimum food basket (thousand Rb)	**0.1**	4.4	-0.6	1.3	0.6	-0.5	0.3	1.1	1.9
The composite index of transportation tariffs (growth rate, %)**	**0.1**	-0.4	3.3	-0.5	-0.5	-0.5	-0.5	-0.5	4.1
The index of pipeline tariffs (growth rate, %)**	**47.1**	**48.5**	48.5	48.0	46.5	45.0	42.5	39.9	36.8
The index of motor freight tariffs (growth rate, %)**	**1.55**	**1.59**	1.60	1.60	1.61	1.61	1.61	1.60	1.60
The Brent oil price ($ a barrel)	**1.26**	**1.28**	1.30	1.31	1.32	1.33	1.34	1.36	1.37
The aluminum price (thousand $ a ton)	**4.69**	**4.64**	4.63	4.62	4.63	4.64	4.65	4.67	4.68
The gold price (thousand $ per ounce)	**8.7**	**8.9**	9.0	9.1	9.2	9.2	9.2	9.3	9.3
The nickel price (thousand $ a ton)	**8.48**	**8.37**	**8.47**	8.43	8.53	8.65	8.63	8.72	9.21
The copper price (thousand $ a ton)	**35.9**	**36.3**	36.4	36.6	36.7	36.9	37.0	37.4	38.4
The monetary base (trillion Rb)	**0.39**	**0.39**	**0.39**	0.39	0.39	0.39	0.39	0.39	0.39
M_2 (trillion Rb)	**66.08**	**64.26**	**66.27**	66.28	67.31	67.64	68.23	68.76	69.35
Gold and foreign exchange reserves (billion $)	**1.11**	**1.11**	**1.12**	1.12	1.11	1.11	1.11	1.11	1.11
The RUR/USD exchange rate (rubles per one USD)	**-6.2**	**-4.8**	-2.6	-3.1	-1.7	-2.3	-1.5	-0.9	0.0
The USD/EUR exchange rate (USD per one Euro)	**-6.1**	**-4.1**	-2.8	-3.0	-1.3	-2.2	-1.6	-0.9	0.1
Real disposable cash income (growth rate, %)*	**1.0**	**1.4**	1.2	5.6	4.3	2.8	3.7	0.6	1.7
Real cash income (growth rate, %)*	**72.2**	72.2	72.6	72.8	72.6	72.3	72.2	72.0	71.6
Real accrued wages (growth rate, %)*	**4.3**	4.3	4.3	4.3	4.3	4.4	4.5	4.6	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.