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 *July* to *December* of 2019, 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 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.

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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 Indexes*. Moscow, IET, 2001; R.M. Entov, V.P. Nosko, A.D. Yudin, P.A. Kadochnikov, S.S. Ponomarenko. *Problems of Forecasting of Some Macroeconomic Indexes*. 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 Indexes 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. No.80. P. 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. No.10. P. 251–270.

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 ndustry, 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 cash 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 choose 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.

INDUSTRIAL PRODUCTION AND RETAIL SALES

Industrial production
For making forecast for July to December 2019, the series of monthly data of the indexes of industrial production released by the Federal State Statistics Service (Rosstat) from January 2002 to April 2019, as well as the series of the base indexes of industrial production released by the National Research University Higher School of Economics (NRU HSE[3]) over the period from January 2010 to May 2019 were used (the corrected value of January 2010 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 indexes of industrial production are calculated using business surveys (BS) as well. The obtained results are shown in Table 1.

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[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.
[3] The indexes in question are calculated by E.A. Baranov and V.A. Bessonov.

Table 1
Calculations of forecast values of indexes of industrial production¹ (%)

	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																		
Jul 19	2.6	3.1	1.3	3.0	1.5	0.3	2.5	1.5	2.6	2.0	3.8	3.0	-2.9	-5.7	2.9	1.8	-4.3	8.7
Aug 19	1.6	1.9	0.7	1.9	0.9	0.2	2.3	-0.1	2.6	1.7	2.4	2.3	-1.6	-0.4	4.5	-2.6	-6.9	3.7
Sep 19	1.2	3.9	2.0	3.2	-0.5	0.9	2.1	2.5	4.6	2.4	3.0	2.1	-1.0	-4.5	6.5	-2.8	-8.3	1.7
Oct 19	1.0	2.8	1.1	2.4	-0.2	0.8	1.0	-0.7	4.7	6.0	1.7	0.4	1.1	-2.7	-3.5	-3.0	-2.0	3.5
Nov 19	1.6	2.2	1.5	2.1	0.5	1.0	3.2	0.3	1.3	0.6	1.5	3.2	-0.8	-5.1	1.0	-3.4	4.9	-0.8
Dec 19	1.7	3.8	1.7	3.3	1.2	0.9	2.1	-0.9	-1.2	-1.2	2.6	6.4	-2.6	-5.3	7.1	-1.0	3.5	-17.3
For reference: actual growth in 2018 on the respective month of 2017																		
Jul 18	3.9			4.8	3.2	2.8	4.6	6.3	1.8	2.2	5.2	2.2	2.6	3.7	3.3	3.1	4.2	6.7
Aug 18	2.7			2.9	4.5	3.4	2.2	2.9	0.1	0.4	6.1	1.2	-0.4	-1.5	-5.2	3.2	13.3	-1.5
Sep 18	2.1			4.0	6.9	5.6	-0.1	3.7	-0.4	-0.3	6.7	2.5	3.5	3.0	-6.5	5.6	15.7	7.9
Oct 18	3.7			4.7	7.4	5.4	2.7	5.7	-3.2	-3.9	6.9	4.6	1.5	0.3	19.6	6.2	-9.3	-6.2
Nov 18	2.4			3.8	7.8	6.0	0.0	2.7	2.4	2.7	6.6	1.4	0.3	2.9	7.2	2.5	-5.6	-1.3
Dec 18	2.0			4.8	6.3	5.7	0.0	4.2	4.5	5.5	4.5	-1.8	0.2	3.5	-8.3	0.2	-6.2	19.1

Note. In the time spans under review, the series of the Rosstat and the NRU HSE chain indexes 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 indexes are stationary at levels.

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¹ It is to be noted that for making of forecasts so-called "raw" indexes (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.

As seen from *Table 1*, the Rosstat average[1] increment of the industrial production index posted 2.3% for July-December 2019 against the same period of the previous year for the industry as a whole. As for the NRU HSE industrial production index, the indicator constitutes 2.0%. At year-end 2018 projected growth of IPI according to Rosstat will amount to 2.8% and IPI of NRU HSE – 1.7%.

The average monthly gain in the Rosstat and the NRU HSE industrial production indexes for mining and quarrying amount to 0.6% and 0.7%, respectively in H2 2019.

The average gain in the industrial production index in manufacturing industry according to Rosstat for July-December 2019 amounts to 2.2% compared to the same period of the previous year and the NRU HSE industrial production index in manufacturing industry comes to 0.4%. The monthly production of food products is forecast to grow on average by 2.5% and 2.9% for the Rosstat and NRU HSE indexes, respectively. The production of coke and petroleum products is forecast to decline on average by – 1.3% and -4.0% for the Rosstat and NRU HSE indexes, respectively. The average monthly change (in growth terms) in the industrial production index for primary metals and fabricated metal products for H2 2019 computed by Rosstat and the NRU HSE constitute 3.1% and -1.8%, respectively. Manufacturing of machinery and equipment is forecast to slide by -2.2% and -0.1% for the Rosstat and the NRU HSE indexes, respectively.

The average gain in the industrial production index for electricity, gas, and steam supply; for air conditioning computed by Rosstat for July-December 2019 in comparison with the same period of the previous year constitutes 2.4%; the same indicator for the NRU HSE industrial production index comes to 1.9% per month.

At year-end 2019, Rosstat industrial production index regarding to reviewed types of activity will on average gain 1.8%, meanwhile IPI of NRU HSE will lose according to forecast on average by 2.6%.

Retail Sales

This section (Table 2) presents forecasts of monthly retail sales made on the basis of monthly Rosstat data over January 1999 – June 2019.

As seen from *Table 2,* the average forecast increment of retail sales turnover in nominal terms for July to December 2019 against the corresponding period of 2018 amounts to around 5.6% and the real sales turnover – 1.6%. Year-on-year, the nominal retail sales turnover will gain 5%, and the real one – 2.1%.

FOREIGN TRADE INDEXES

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 2019 on the basis of the data released by the Central Bank of Russia.[2] The results of calculations are shown in Table 3.

Table 2

Calculations of forecast values of retail sales and real retail sales

	Forecast value according to ARIMA-model	
	Retail sales, billion RUB (in brackets – growth on the respective month of the previous year, %)	Real retail sales (as % of the respective period of the previous year)
Jul 19	2803.1 (6.0)	100.7
Aug 19	2903.8 (5.8)	101.2
Sep 19	2874.0 (5.7)	101.3
Oct 19	2899.2 (5.6)	102.1
Nov 19	2906.1 (5.2)	101.9
Dec 19	3477.2 (5.0)	102.2
For reference: actual values in the same months of 2018		
Jul 18	2643.9	102.8
Aug 18	2744.0	103.0
Sep 18	2719.1	102.3
Oct 18	2744.9	102.2
Nov 18	2762.8	103.3
Dec 18	3311.6	102.7

Note. The series of retail sales and real retail sales over January 1999 – June 2019.

Export, import, export outside the CIS and import from the countries outside the CIS are forecast to grow on average at 2.2%, 3.8%, 1.1%, and 4.1%, respectively for July-December 2019 against the same period of

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[1] Average growth of industrial production indexes is the average value of these indexes for six months under review.
[2] 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.

Table 3

Calculations of forecast values of volumes of foreign trade turnover with countries outside the CIS

	Exports to all countries				Imports from all countries				Exports to countries outside the CIS				Imports 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
Jul 19	33.6	35.9	98	105	22.2	21.5	105	101	26.5	31.1	89	104	19.7	19.7	103	103
Aug 19	35.7	41.8	95	112	22.3	21.7	103	100	31.2	35.5	95	109	20.4	20.0	105	103
Sep 19	36.1	41.5	93	107	21.7	21.2	110	107	32.4	36.5	95	108	19.5	19.0	110	107
Oct 19	38.2	42.5	93	103	22.4	21.6	104	101	34.6	36.2	97	101	19.8	19.3	103	100
Nov 19	40.6	43.1	101	107	22.3	22.0	105	103	35.1	36.6	99	103	19.5	19.9	103	105
Dec 19	42.0	44.7	103	109	22.9	23.6	102	105	37.4	38.3	104	107	20.9	21.0	104	105
For reference: actual values in respective months of 2018 (billion USD)																
Jul 18	34.3				21.2				29.8				19.0			
Aug 18	37.5				21.7				32.7				19.5			
Sep 18	38.6				19.8				33.9				17.8			
Oct 18	41.3				21.5				35.8				19.2			
Nov 18	40.3				21.3				35.5				19.0			
Dec 18	40.8				22.4				35.8				20.1			

Note. Over the period from January 1999 to May 2019, the series of exports, imports, exports to the countries outside the CIS and imports 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 indexes

	The consumer price index (ARIMA)	The consumer price index (SM)	The consumer price index (FM)	for industrial goods (ARIMA)	for industrial goods (BS)	for industrial goods (FM)	Producer price indexes:											
							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)																		
Jul 19	100.6	100.3	100.5	100.8	100.4	100.6	101.0	100.1	100.7	100.8	100.3	100.6	100.0	102.4	101.1	101.1	100.3	100.6
Aug 19	100.1	100.1	100.4	101.1	100.7	100.6	99.9	100.2	102.2	100.4	100.7	100.7	100.3	102.6	100.9	100.3	100.3	99.7
Sep 19	100.4	100.3	100.6	101.0	100.9	100.6	99.8	100.5	100.5	100.7	100.2	100.3	100.2	102.6	100.8	101.2	100.2	100.1
Oct 19	100.3	100.3	100.6	101.0	101.1	100.7	100.0	100.6	100.6	100.6	100.7	100.7	100.1	102.4	100.7	101.3	100.2	100.9
Nov 19	100.3	100.4	100.4	99.9	100.5	100.6	99.6	100.6	99.9	100.2	100.5	100.4	100.3	102.4	101.2	100.7	100.3	100.4
Dec 19	100.6	100.4	100.5	99.6	99.9	100.7	98.6	100.0	99.9	100.4	100.4	100.0	100.1	98.4	100.3	100.5	100.3	100.8
Forecast values (% of December 2018)																		
Jul 19	103.5	102.6	102.5	101.1	101.1	103.2	99.9	100.0	101.1	100.2	102.1	101.3	101.2	93.9	100.9	103.0	102.7	104.0
Aug 19	103.7	102.7	102.9	102.2	101.8	103.9	99.8	100.2	103.4	100.6	102.8	102.0	101.5	96.4	101.8	103.3	103.0	103.7
Sep 19	104.0	103.0	103.5	103.3	102.7	104.5	99.5	100.7	103.9	101.3	103.0	102.3	101.7	98.9	102.6	104.6	103.2	103.8
Oct 19	104.4	103.4	104.2	104.3	103.8	105.2	99.5	101.3	104.5	101.9	103.8	103.0	101.9	101.3	103.3	106.0	103.4	104.8
Nov 19	104.7	103.8	104.6	104.2	104.3	105.8	99.2	101.9	104.4	102.2	104.3	103.4	102.2	103.7	104.6	106.8	103.7	105.2
Dec 19	105.3	104.2	105.1	103.8	104.2	106.6	97.8	101.9	104.3	102.6	104.7	103.5	102.3	102.0	105.0	107.3	104.0	106.0
For reference: actual values in the same periods of 2018 (% of December 2017)																		
Jul 18		102.4			109.3		118.8	108.2	99.1	103.0	103.7	108.1	107.2	119.8	107.6	110.4	108.9	101.3
Aug 18		102.4			109.5		116.7	109.0	101.4	103.5	103.6	109.1	109.8	121.5	110.2	109.8	110.5	102.7
Sep 18		102.6			110.9		118.4	110.6	102.0	104.3	105.3	109.4	111.6	127.6	112.4	111.5	109.0	102.5
Oct 18		103.0			114.6		128.2	112.4	104.1	105.3	104.4	110.3	113.1	135.9	115.2	109.9	106.2	102.9
Nov 18		103.6			115.4		131.1	112.7	103.8	106.8	106.5	111.2	114.9	136.3	115.5	108.8	105.0	103.1
Dec 18		104.4			111.6		121.0	110.5	103.5	107.5	107.0	111.3	115.6	123.4	113.3	108.6	105.5	103.7

Note. Over the period from January 1999 to April 2019, 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 indexes are stationary at levels.

2018. The average forecast surplus volume of the trade balance with all countries for July-December 2019 will amount to $105.2bn, which reflects an increase by 0.2% on the same period of 2018.

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 2019.[1] Table 4 presents the results of model calculations of forecast values over July and December 2019 in accordance with ARIMA models, structural models (SM) and models computed with the help of business surveys (BS).

The forecast average monthly increment in the consumer price index in H2 2019 will come to 0.4%. The producer price index for industrial goods for the same period is forecast to average 0.6% per month. Annual gain in consumer price index on three models will average 4.8%. The same indicator for the producer price index is forecast at 4.9%.

The Rosstat producer price indexes are forecast to grow at average monthly rate for July-December 2019: for mining and quarrying (-0.2%), manufacturing 0.3%, utilities (electricity, gas, and steam) 0.6%, food products 0.5%, textile and sewing industry 0.5%, wood products 0.4%, pulp and paper industry 0.2%, coke and refined petroleum 1.8%, for chemical industry 0.8%, for basic metals and fabricated metal 0.9%, for machinery and equipment 0.3%, and for motor vehicles manufacture 0.4%.

Annual gain in the producer price indexes across types of economic activity will average 3.5%. At year-end 2019, the maximum annual gain is projected in basic metals and fabricated metal (7%), and the minimum one – in mining and quarrying (-2.2%).

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 July and December of 2019. The forecasts were made on the basis of time series with use the Rosstat data over the period from January 2000 to June 2019. The results are shown in Table 5.

As can be seen from *Table 5*, the minimum set of food products' cost is forecast to grow compared to the corresponding period of the previous year. This being said, the minimum set of food products is forecast to average RUB 4,235.7. The minimum set of food products cost is forecast to grow on average at around 8.0% against the same period of the previous year. Annual gain in the minimum set of food products cost will amount to 7.1% in 2019.

Table 5
The forecast of the cost of monthly per capita minimum food basket

Forecast values according to ARIMA-model (RUB)	
Jul 19	4299.9
Aug 19	4231.9
Sep 19	4204.8
Oct 19	4192.2
Nov 19	4213.0
Dec 19	4271.2
For reference: actual values in the same months of 2018 (billion RUB)	
Jul 18	4040.9
Aug 18	3943.3
Sep 18	3840.2
Oct 18	3833.2
Nov 18	3883.5
Dec 18	3989.2
Expected growth on the respective month of the previous year (%)	
Jul 19	6.4
Aug 19	7.3
Sep 19	9.5
Oct 19	9.4
Nov 19	8.5
Dec 19	7.1

Note. The series of the cost of the monthly per capita minimum food basket over the period from January 2000 June 2019 are stationary in the first-order differences.

[1] Structural models were evaluated in the period from October 1998.

Indexes of Freight Tariffs

This section presents calculations of forecast values of freight tariff indexes 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 2019. Table 6 shows the results of model calculations of forecast values in July-December of 2019. It should be noted that some of the indexes under review (for instance, the index of pipeline tariff) 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 in tariffs 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.

According to the forecast for July-December 2019, the composite index of transport tariffs on freight carriage will be declining at an average monthly rate of 0.1%. This being said, in October 2019, the seasonal increment of this index is projected at 4.5 p.p., and in July – up by 3.3 p.p. As a result, its annual gain will come to 1.4% in 2019.

The index of motor freight tariffs will be declining during these six months at an average monthly rate of 0.1%. Its annual increment in 2019 is forecast at 1.1%

The index of pipeline tariffs during coming six months will be growing at an average monthly rate of 1.3%. As a result, its annual gain in 2019 will amount to 9.0%.

Table 6

Calculations of forecast values of indexes of freight tariffs

	The composite index of transport tariff	The index of motor freight tariff	The index of pipeline tariff
Forecast values according to ARIMA-models (% of the previous month)			
Jul 19	103.3	99.9	101.5
Aug 19	100.0	99.9	103.2
Sep 19	100.0	99.9	99.9
Oct 19	95.5	99.8	98.6
Nov 19	99.9	99.8	101.9
Dec 19	99.9	99.8	102.7
Forecast values according to ARIMA-models (% of December of the previous year)			
Jul 19	106.1	101.9	101.5
Aug 19	106.1	101.8	104.8
Sep 19	106.0	101.6	104.6
Oct 19	101.3	101.5	103.2
Nov 19	101.2	101.3	105.1
Dec 19	101.1	101.1	108.0
For reference: actual values in the same period of 2018 (% of the previous month)			
Jul 18	103.7	100.0	108.2
Aug 18	100.2	100.1	100.3
Sep 18	100.1	100.0	99.9
Oct 18	94.8	100.1	88.7
Nov 18	100.7	99.9	100.0
Dec 18	101.0	100.1	102.2

Note. Over the period from September 1998 to May 2019, the series of the freight tariff index were identified as stationary ones; the other series were identified as stationary ones over the period from November 1998 May 2019, 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 aluminum prices (US$ per ton), the gold prices ($ per ounce), the copper prices (US$ per ton), and the nickel prices (US$ per ton) over July to December of 2019 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 May 2019.

The crude oil price is forecast to average around $52.4 per barrel, which is below its corresponding year-earlier indexes on average by 24.0%. The aluminum prices are forecast to average around $1,738 per ton and their average forecast slide constitutes around 13.0% compared to the same level of last year. The gold price is forecast to average $1,310 per ounce. The copper price is forecast to average $5,466 per ton, and prices for nickel – around $11,923 per ton. The average forecast price increase in gold constitutes around 7.0 %, the average decline in copper prices – around 11.0%, and average slide in nickel prices – 1.0% against the corresponding level of last year.

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

At year-end 2019, the forecast growth in gold and nickel prices compared to late 2018 will come to 6.3% and 11.5% respectively. Projected decline in process on crude oil, aluminum and copper will constitute 8.7%, 5%, and 9.8%, respectively.

MONETARY INDEXES

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 July to December of 2019 were received on the basis of models of time-series of respective indexes calculated by the CBR[1] in the period from October 1998 to July 2019 for the monetary base and from October 1998 till June 2019 for M_2 monetary aggregate. Table 8 presents the results of calculations of forecast values and actual values of those indexes 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 July – December 2019, the monetary base will be growing at an average monthly rate of 0.6%. Annual gain in the monetary base in 2019 will come according to projections to 4.8%.

In the period under review, M_2 monetary index will be growing with an average monthly rate of 0.2%. Annual increment of M_2 index in 2019 is forecast at 5.4%.

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 of 2019. 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

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

Table 7

Calculations of forecast values of world prices on natural resources

	Brent oil ($ per barrel)	Aluminum ($ per ton)	Gold ($ per ounce)	Copper ($ per ton)	Nickel ($ per ton)
Forecast values					
Jul 19	57.99	1753	1300	5517	11985
Aug 19	53.14	1728	1299	5521	11927
Sep 19	50.92	1742	1302	5486	11916
Oct 19	51.38	1741	1313	5456	11893
Nov 19	51.72	1730	1322	5420	11918
Dec 19	49.10	1732	1327	5396	11905
Expected growth on the respective month of the previous year (%)					
Jul 19	-21.9	-15.8	5.0	-12.7	-14.9
Aug 19	-31.4	-18.5	8.2	-7.8	-6.9
Sep 19	-38.4	-15.1	8.6	-12.3	-5.0
Oct 19	-31.9	-11.0	8.0	-9.0	3.0
Nov 19	-11.9	-11.7	8.3	-12.5	7.4
Dec 19	-8.7	-5.0	6.3	-9.8	11.5
For reference: actual values in the same period of 2017–2018					
Jul 18	74.25	2083	1239	6323	14075
Aug 18	77.42	2120	1201	5986	12815
Sep 18	82.72	2053	1198	6259	12548
Oct 18	75.47	1956	1215	5998	11543
Nov 18	58.71	1958	1221	6197	11098
Dec 18	53.80	1823	1248	5981	10678

Note. Over the period from January 1980 to May 2019, the series of prices of crude oil, nickel, gold, copper, and aluminum are series of DS type.

Table 8

The forecast of M_2 and the monetary base

	The Monetary base		M_2	
	Billion RUB	Growth on the previous month, %	Billion RUB	Growth on the previous month, %
Jul 19	10334	0.9	47109	0.8
Aug 19	10333	0.0	46748	-0.8
Sep 19	10477	1.4	47109	0.8
Oct 19	10468	-0.1	46748	-0.8
Nov 19	10614	1.4	47109	0.8
Dec 19	10607	-0.1	47317	0.4
For reference: actual value in the respective months of 2018 (growth on the previous month, %)				
Jul 18	2.1		2.0	
Aug 18	1.0		-0.5	
Sep 18	1.0		1.0	
Oct 18	0.0		-0.3	
Nov 18	-0.8		-0.1	
Dec 18	-0.9		1.5	

Note. Over the period from October 1998 to July 2019, the time series of monetary base were attributed to the class of series which are stationary in the first-order differences and have an explicit seasonal component and the time series of M2 monetary aggregate from October 1998 to June 2019 were identified as stationary series with explicit seasonal component.

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 findings for July – December 2019, the international reserves will be growing at an average monthly rate of 0.6%. In 2019, the international reserves are forest to increase by 10.9%.

FOREIGN EXCHANGE RATES

The model calculations of prospective values of the foreign exchange rates (RUB 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 June 2019 and from February 1999 to June 2019,[1] respectively.

In July–December 2019, USD/RUB average exchange rate is forecast in the amount of RUB 64.10 per USD. Projected for late 2019 value of this index will average to RUB 64.82 per USD according to two models.

Projected Euro/USD exchange rate over the period under review will average USD 1.11 per 1 euro. In late 2019, value of the index is forecast to average at USD 1.11 per 1 euro according to two models.

THE LIVING STANDARD INDEXES

This section (see Table 11) presents calculations of forecast values of indexes of real disposable cash income and real cash income[2]as were received on the basis of models of time series of respective indexes computed by Rosstat and taken over the period from January 1999 to January 2019 (for real accrued wage from January 1999 to June 2019. The above indexes 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 indexes under review. As a result, the future values of the indexes

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, %
Jul 19	498.5	0.7
Aug 19	501.6	0.6
Sep 19	504.5	0.6
Oct 19	507.0	0.5
Nov 19	509.6	0.5
Dec 19	512,3	0,5
For reference: actual values in the same period of 2018		
Jul 18	456.7	0.0
Aug 18	458.0	0.3
Sep 18	460.6	0.6
Oct 18	459.2	-0.3
Nov 18	459.6	0.1
Dec 18	462.1	0.6

Note. Over the period from October 1998 to June 2019, the series of the gold and foreign exchange reserves of the Russian Federation were identified as stationary series in difference.

Table 10
Forecasts of the USD/RUB and EUR/USD exchange rates

	The USD/RUB exchange rate (RUB per USD)		The EUR/USD exchange rate (USD per EUR)	
	ARIMA	SM	ARIMA	SM
Jul 19	63.42	63.42	1.11	1.11
Aug 19	63.33	63.79	1.12	1.11
Sep 19	63.75	64.51	1.12	1.10
Oct 19	63.86	64.60	1.12	1.11
Nov 19	64.06	64.81	1.12	1.11
Dec 19	64.24	65.39	1.12	1.10
For reference: actual values in the similar period of 2018				
Jul 18	62.78		1.18	
Aug 18	68.08		1.16	
Sep 18	65.59		1.16	
Oct 18	65.77		1.14	
Nov 18	66.63		1.14	
Dec 18	69.47		1.15	

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 Bulletin uses the IMF data related to Euro/USD exchange rate for the period from January 1999 to April 2019, and on USD/RUB exchange rate from October 1998 to May 2019. Data on Euro/USD exchange rate for May-June 2019 and on USD/RUB exchange rate for June 2019 were taken from the exchange rate website www.oanda.com.

[2] Real cash income – a relative index which is calculated by means of division of the index of nominal size (i.e. which was formed in the period under review) of cash income of the population by the CPI. Real disposable cash income – is cash income less mandatory payments and contributions. (See: Rossiisky Statistichesky Ezhegodnik. Moscow, Rosstat, 2004. P. 212).

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*, projected real disposable cash income will be growing on average at 1.3% on a monthly rate compared to the previous year; real cash income – 1.1%; real wages will amount to 4%.

At year-end 2019, projected increase in real disposable cash income will amount to 0.9%, real cash income – by 0.8%, and growth of real wage – by 2.8%.

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 April 2019 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 11

The forecast of the living standard indexes

	Real disposable cash income	Real cash income	Real accrued wages
Forecast values according to ARIMA-models (% of the respective month of 2018)			
Jul 19	99.9	100.2	102.7
Aug 19	101.6	101.3	103.3
Sep 19	101.8	101.1	103.8
Oct 19	100.6	100.2	104.2
Nov 19	103.2	102.5	104.7
Dec 19	100.4	101.1	105.0
For reference: actual values in the respective period of 2018 (% of the same period of 2017)			
Jul 18	101.5	102.1	107.5
Aug 18	97.7	98.9	106.8
Sep 18	95.9	97.5	104.9
Oct 18	100.0	101.75	105.2
Nov 18	95.7	98.07	104.2
Dec 18	100.1	102.15	102.9

Note. For calculating purposes the series of disposable cash income, real cash income, and real wages in base form were used (January 1999 was adopted as a base period). Over the period from January 1999 to January 2019 (for real wages – from January 1999 to June 2019) those series were attributed to the class of processes, which are stationary in differences and have an explicit seasonal component.

According to ARIMA-model forecast (*Table 12*), in H2 2019, the increase in the number of employed in the economy will average 0.4% per month against the corresponding period of the previous year. As of year-end 2019, projected number of employed in the economy population will come to 72 mn persons.

The average decrease in the total number of unemployed is forecast at 4.2% per month against the same period of last year. Average number of jobless in late 2018 is forecast to hit 3.5 mn persons.

Table 12

Calculation of forecast values of the indexes 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
Jul 19	72.6	-0.1	3.4	-5.4	4.7	3.4	-4.5	4.7
Aug 19	73.1	-0.4	3.3	-4.6	4.6	3.4	-2.7	4.7

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[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 April 2019.

[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.

	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
Sep 19	72.8	-0.4	3.3	-2.6	4.6	3.3	-1.8	4.5
Oct 19	72.4	-0.2	3.5	-3.4	4.8	3.4	-4.8	4.7
Nov 19	72.2	-0.5	3.6	-3.1	5.0	3.4	-7.1	4.7
Dec 19	72.0	-0.8	3.6	-3.1	5.0	3.4	-7.1	4.7
For reference: actual values in the same periods of 2018 (million people)								
Jul 18	72.7		3.6					
Aug 18	73.4		3.5					
Sep 18	73.1		3.4					
Oct 18	72.5		3.6					
Nov 18	72.6		3.7					
Dec 18	72.6		3.7					

Note. Over the period from October 1998 to April 2019, 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 indexes include seasonal component.

ANNEX

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

Fig. 1a. The Rosstat industrial production index (ARIMA-model)
(% of December 2001)
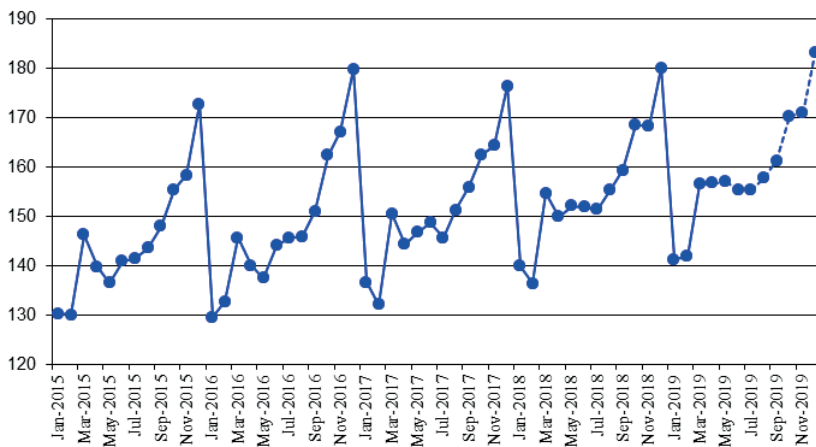
Fig. 1b. The NRU HSE industrial production index (ARIMA-model)
(% of January 2010)
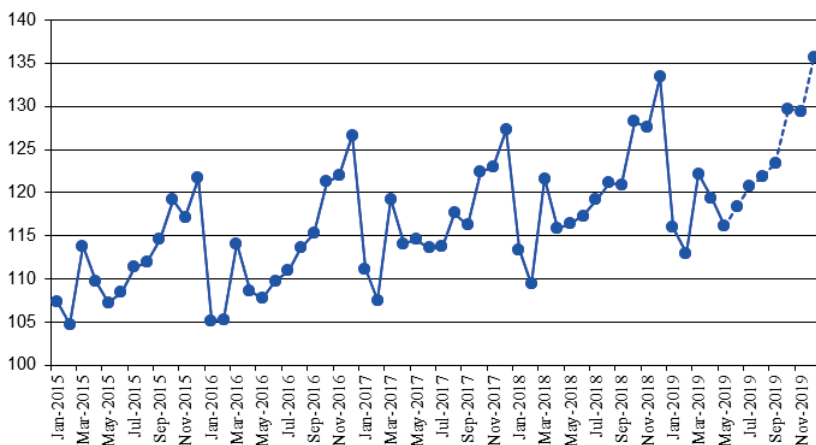
Fig. 2a. The Rosstat industrial production index for mining
(% of December 2001)
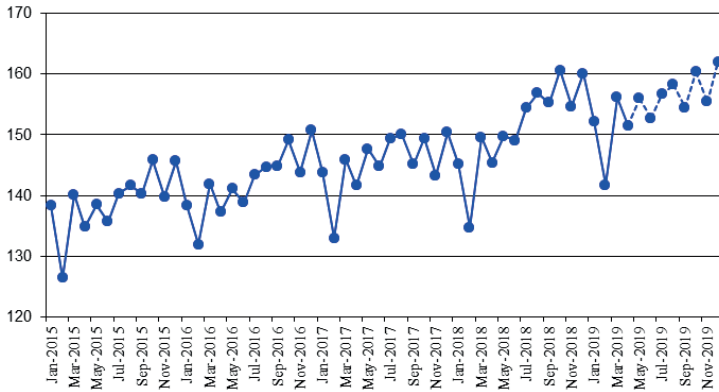
Fig. 2b. The NRU HSE industrial production index for mining
 (% of January 2010)
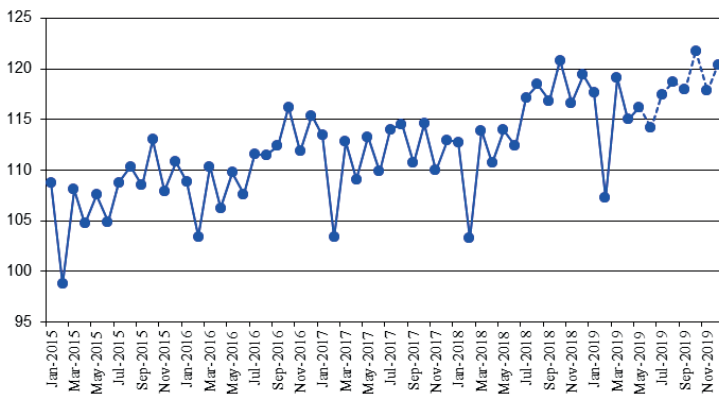
Fig. 3a. The Rosstat industrial production index for manufacturing
(% of December 2001)
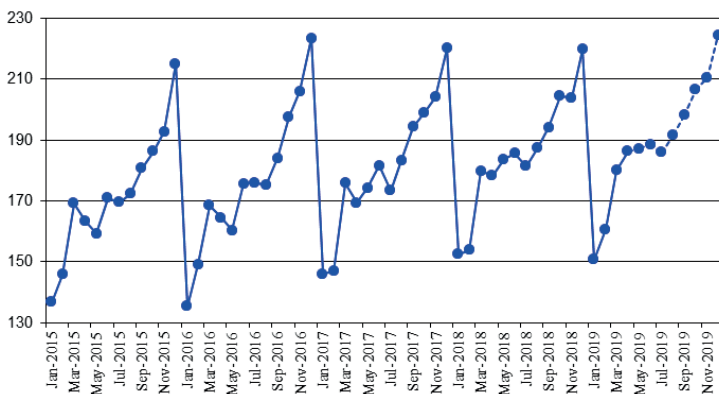
Fig. 3b. The NRU HSE industrial production index for manufacturing
(% of January 2010)
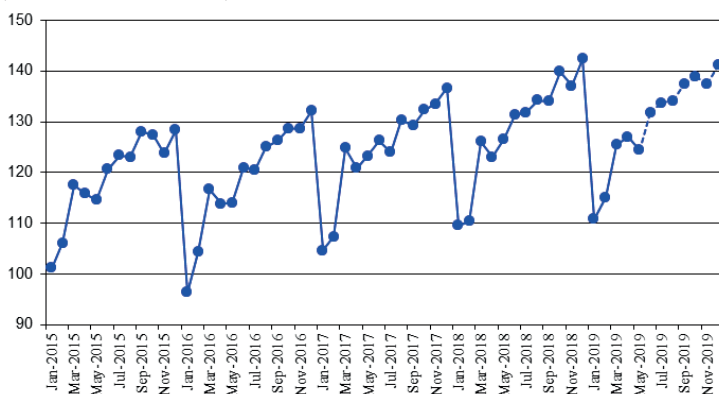
Fig. 4a. The Rosstat industrial production index for utilities
(electricity, water, and gas) (as a percentage of that in December 2001)
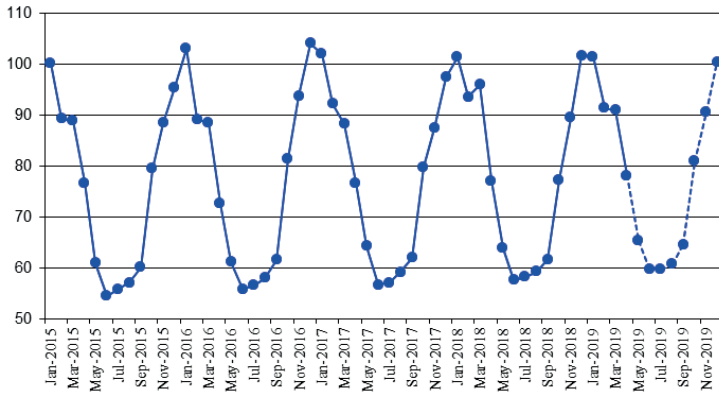
Fig. 4b. The NRU HSE industrial production index for utilities
(electricity, water, and gas) (as a percentage of that in January 2010)
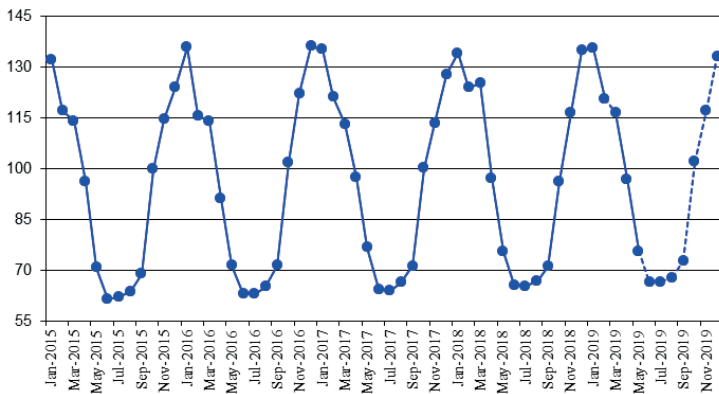
Fig. 5a. The Rosstat industrial production index for food products
(as a percentage of that in December 2001)
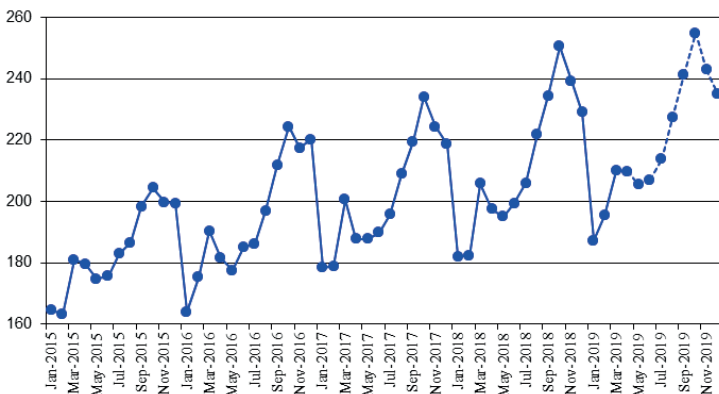
Fig. 5b. The NRU HSE industrial production index for food products
(as a percentage of that in January 2010)
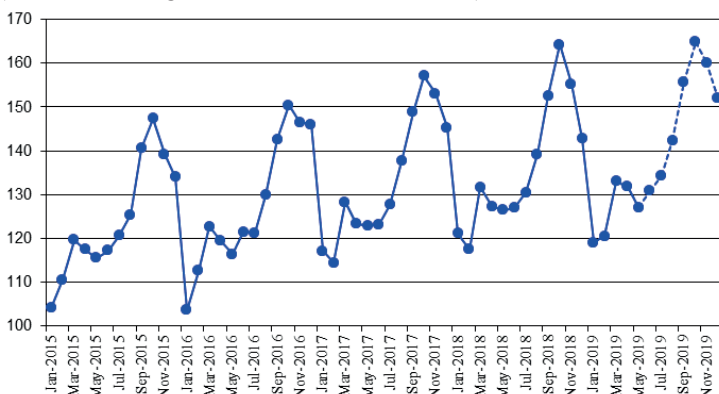
Fig. 6a. The Rosstat industrial production index for coke and petroleum (as a percentage of that in December 2001)
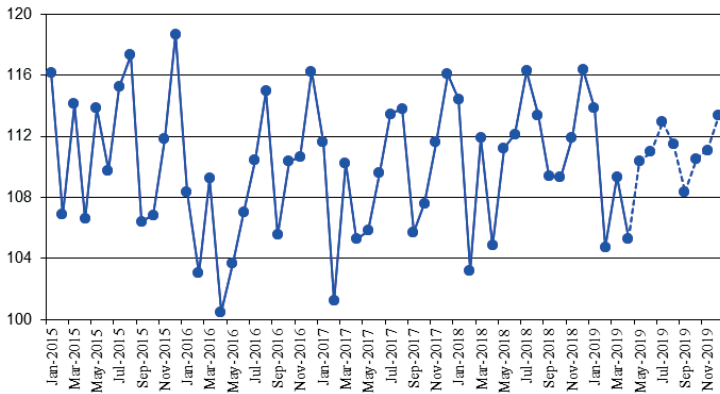
Fig. 6b. The NRU HSE industrial production index for petroleum and coke (as a percentage of that in January 2010)
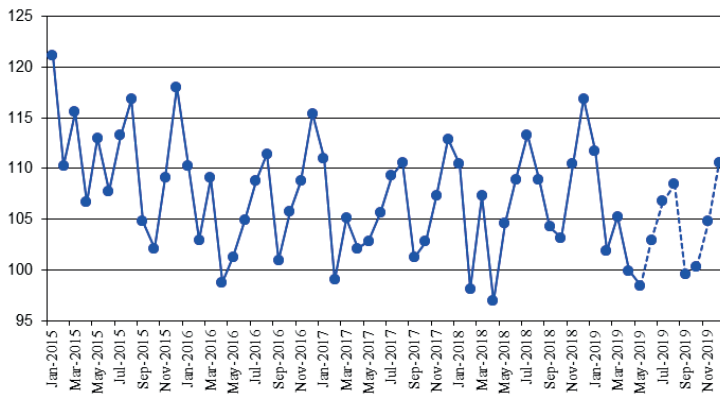
Fig.7a. The Rosstat industrial production index for primary metals and fabricated metal products (as a percentage of that in December 2001)
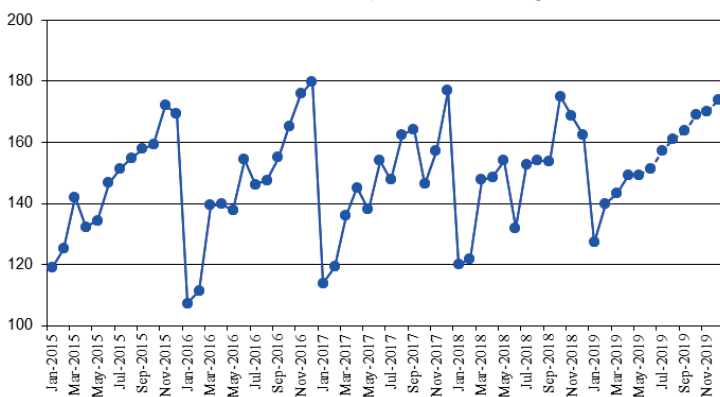
Fig. 7b. The NRU HSE industrial production index for primary metals and fabricated metal products (as a percentage of that in January 2010)
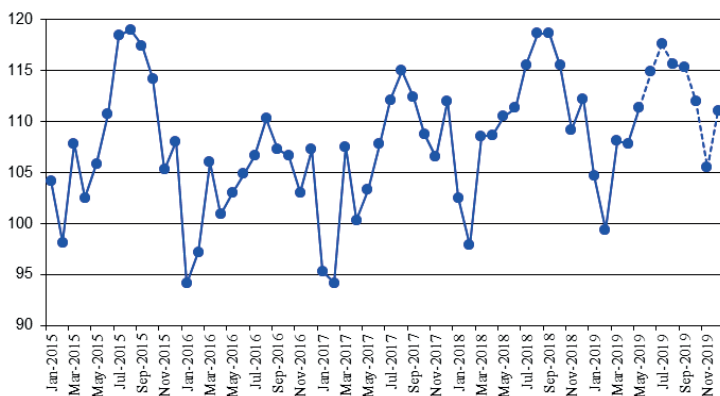
Fig. 8a. The Rosstat industrial production index for machinery (as a percentage of that in December 2001)
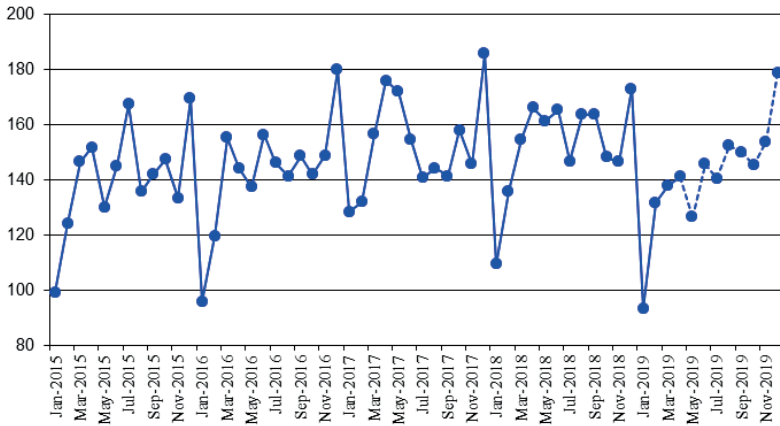
Fig. 8b. The NRU HSE industrial production index for machinery (as a percentage of that in January 2010)
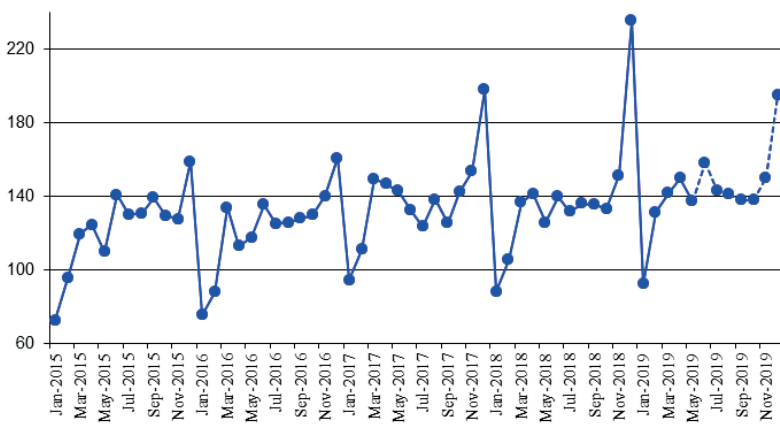
Fig. 9. The volume of retail sales (billion RUB)
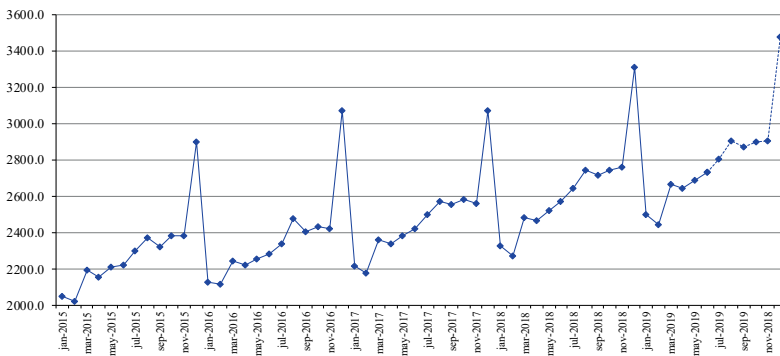
Fig. 9a. The real volume of retail sales (as a percentage of that in the same period of the previous year)
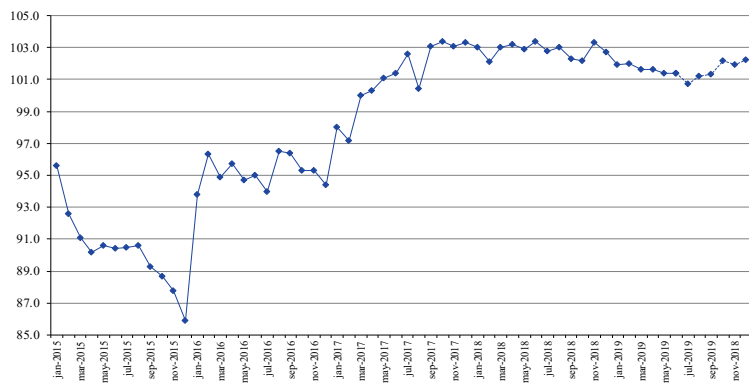
Fig.10. Export to all countries (billion USD)
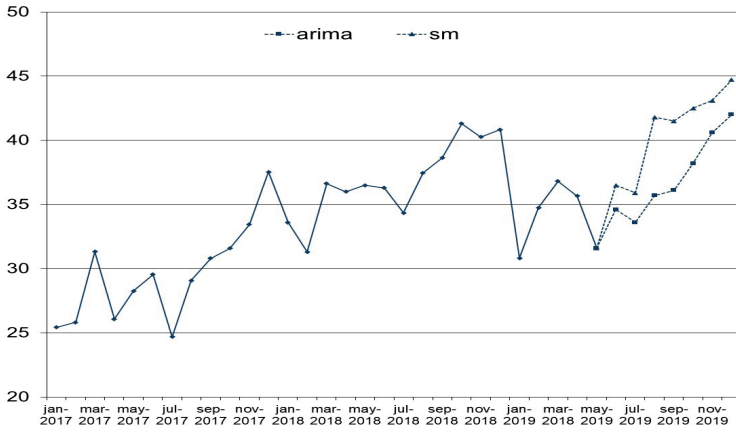
Fig. 11. Export to countries outside the CIS (billion USD)
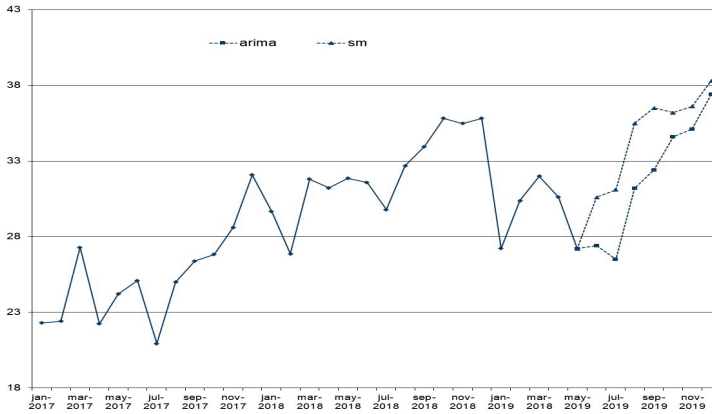
Fig. 12. Import from all countries (billion USD)
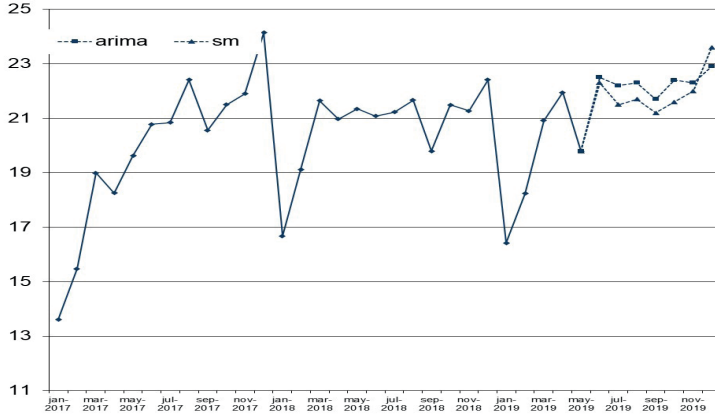
Fig. 13. Import from countries outside the CIS (billion USD)
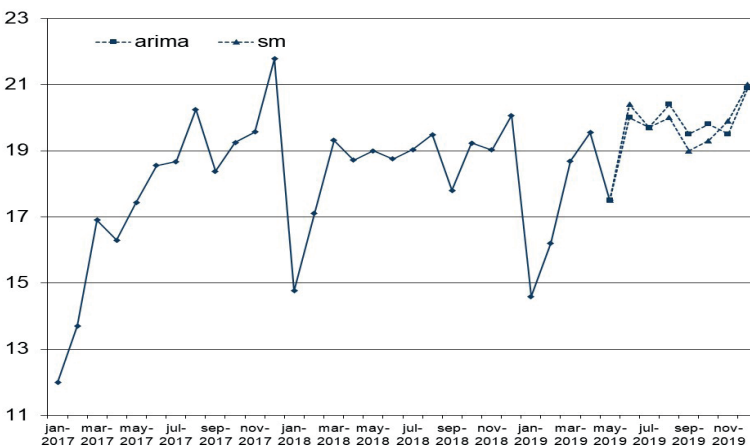
Fig. 14. The consumer price index (as a percentage of that in December of the previous year)
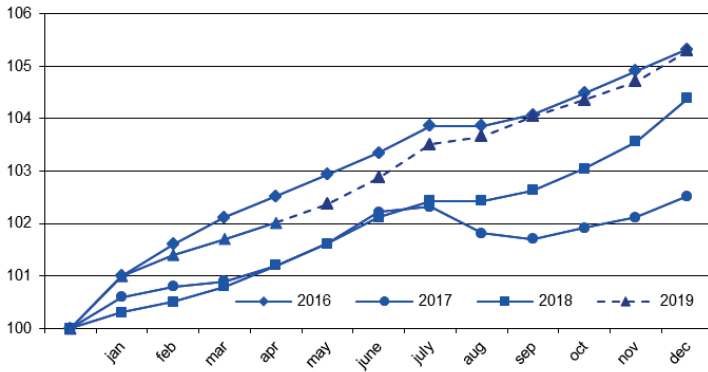
Fig. 14a. The consumer price index (as a percentage of that in December of the previous year) (SM)
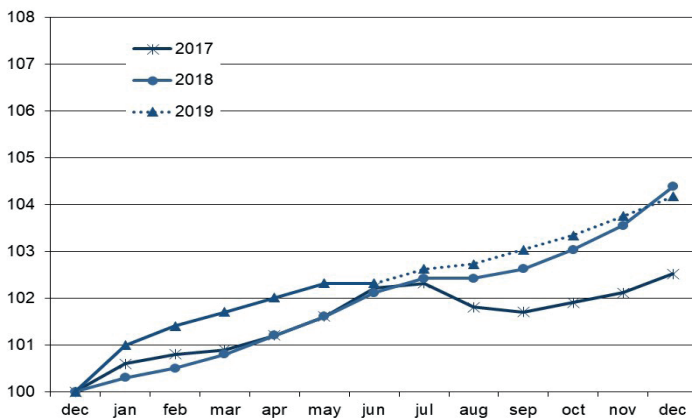
Fig.15. The producer price index for industrial goods (as a percentage of that in December of the previous year)
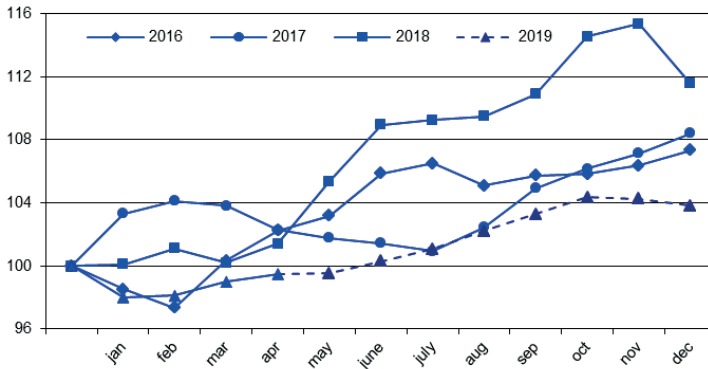
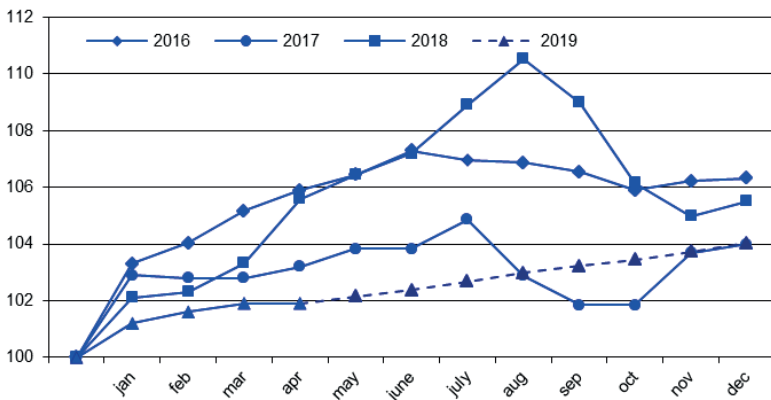*Fig. 16. The price index for mining (as a percentage of that in December of the previous year)*
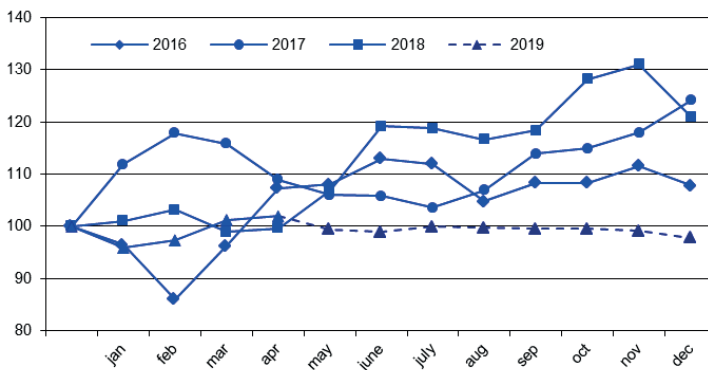
Fig. 17. The price index for manufacturing
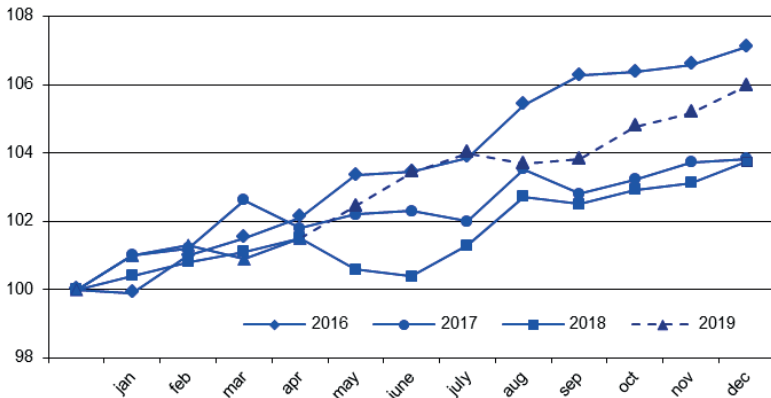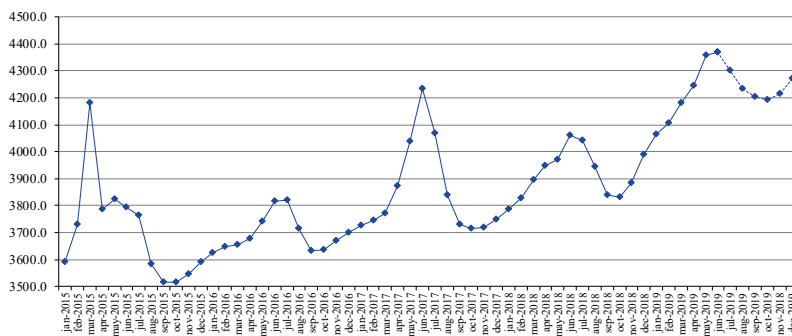*(as a percentage of that in December of the previous year)*
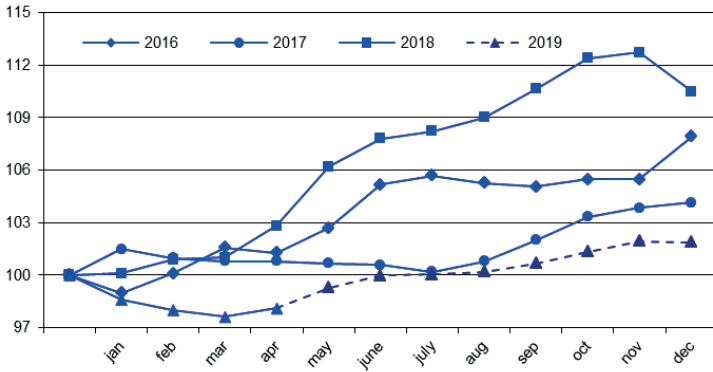
Fig. 18. The price index for utilities (electricity, water, and gas)
(as a percentage of that in December of the previous year)
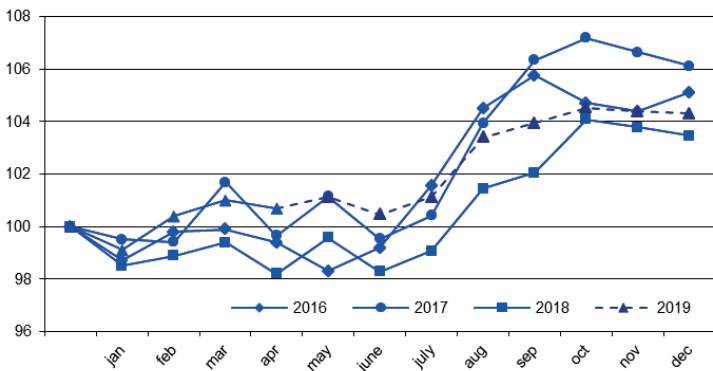
Fig. 19. The price index for food products (as a percentage
of that in December of the previous year)
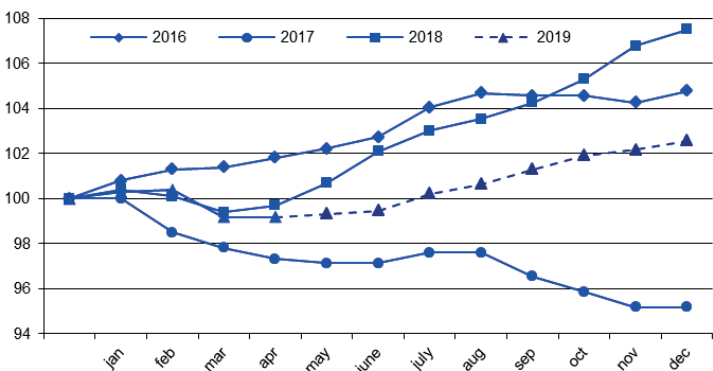
Fig. 20. The price index for the textile and sewing industry
(as a percentage of that in December of the previous year)
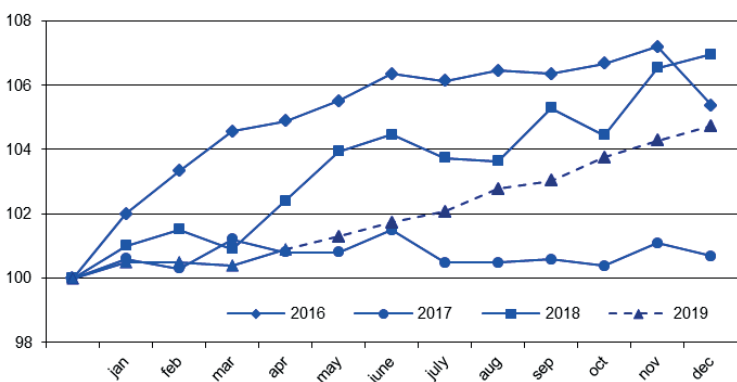
Fig. 21. The price index for wood products
(as a percentage of that in December of the previous year)
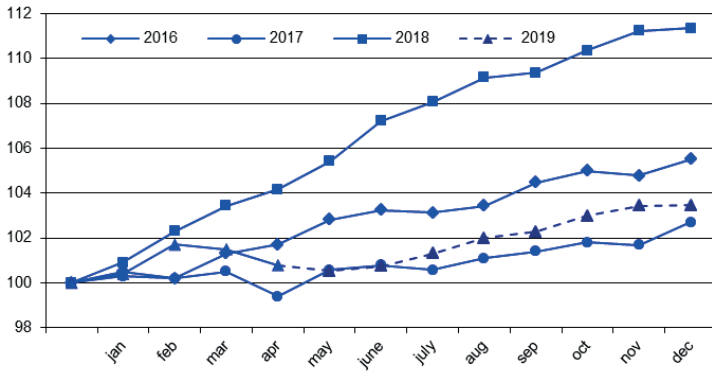
Fig. 22. The price index for the pulp and paper industry
(as a percentage of that in December of the previous year)
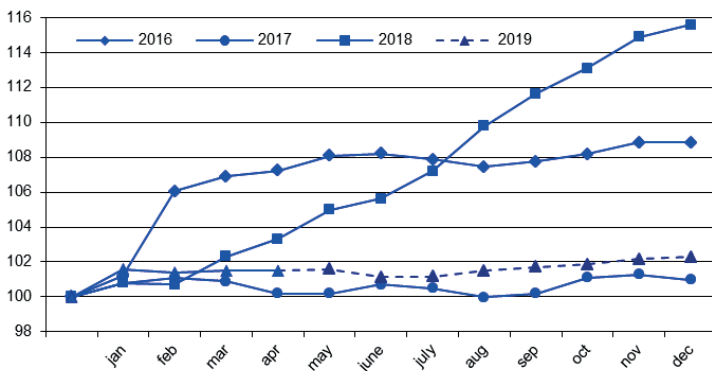
Fig. 23. The price index for coke and petroleum
(as a percentage of that in December of the previous year)
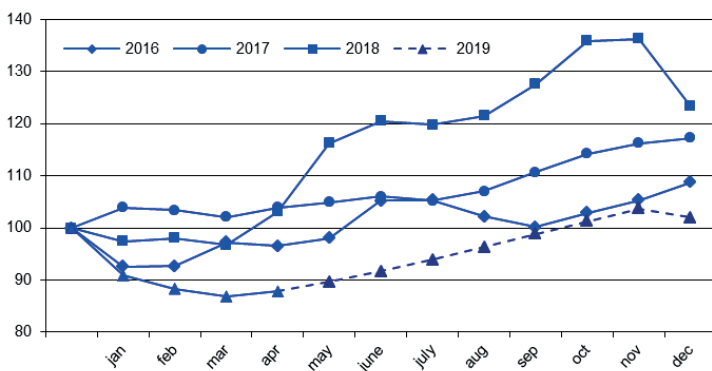
Fig. 24. The price index for the chemical industry
(as a percentage of that in December of the previous year)
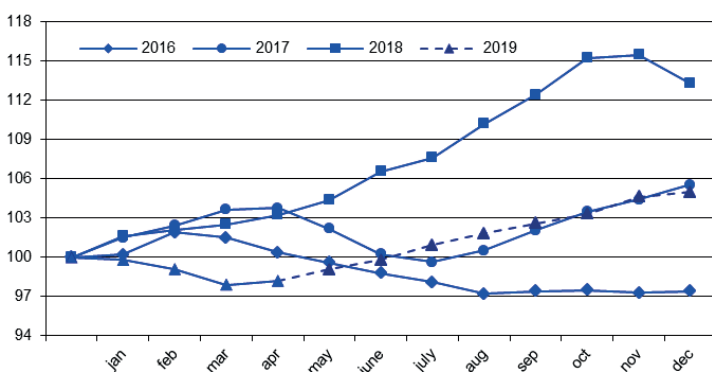
Fig. 25. The price index for primary metals and fabricated metal products
(as a percentage of that in December of the previous year)
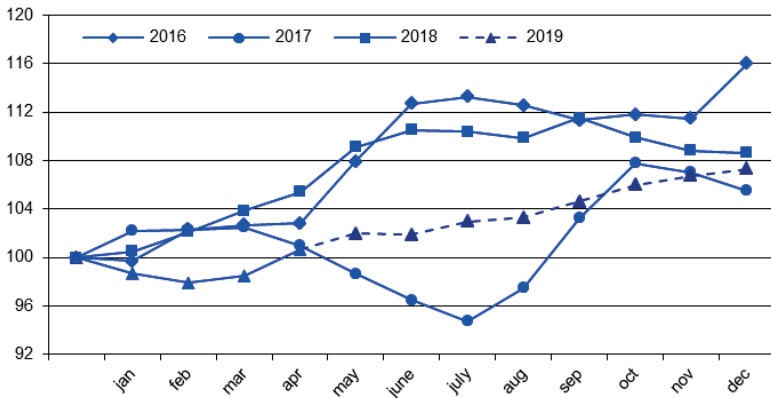
Fig. 26. The price index for machinery
(as a percentage of that in December of the previous year)

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 (RUB)

Fig. 29. The composite index of transport tariffs
(for each year, as a percentage of that in the previous month)
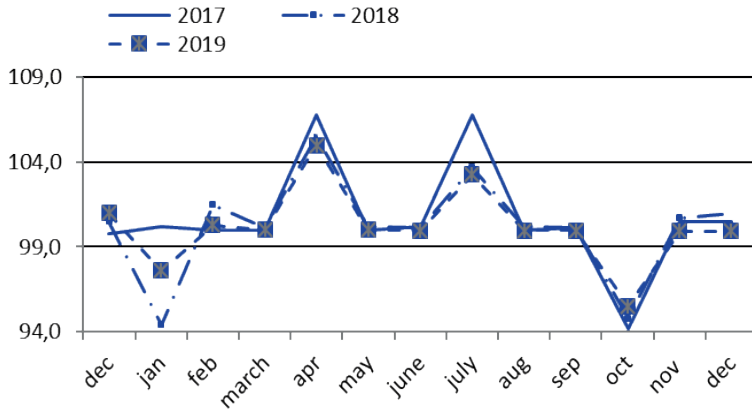
Fig. 30. The index of motor freight tariffs
(for each year, as a percentage of that in the previous month)
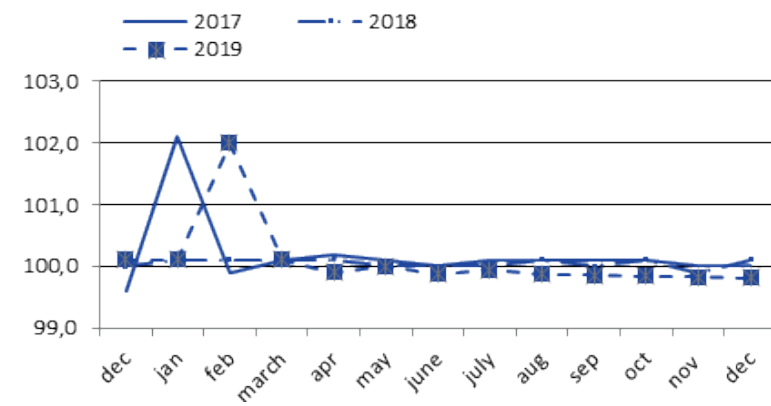
Fig. 31. The index of pipeline tariffs
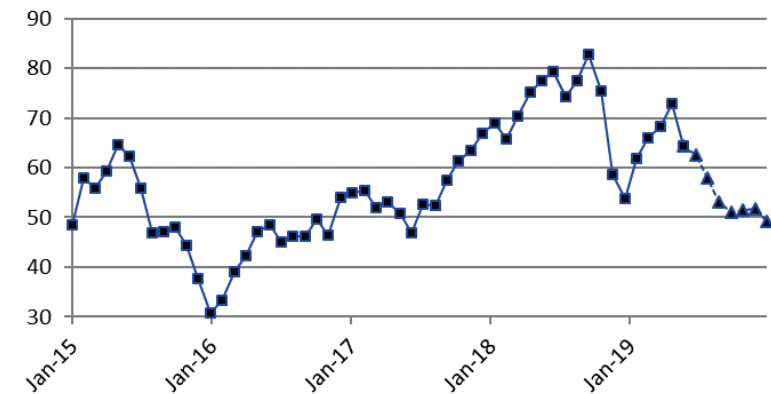*(for each year, as a percentage of that in the previous month)*
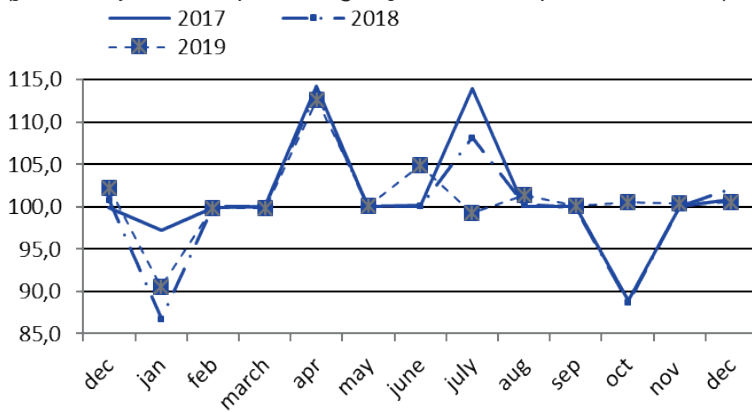
Fig. 32. The Brent oil price ($ per barrel)

Fig. 33. The aluminum price ($ per ton)
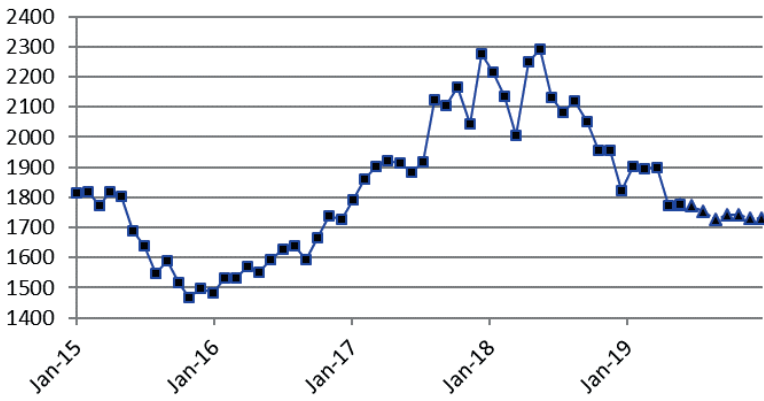
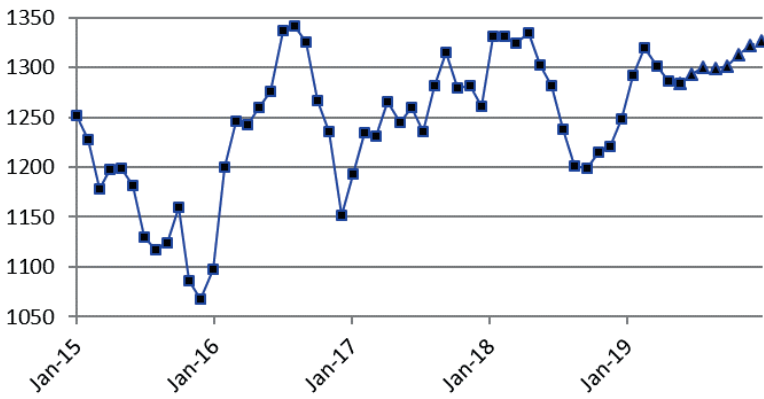*Fig. 34. The gold price ($ per ounce)*
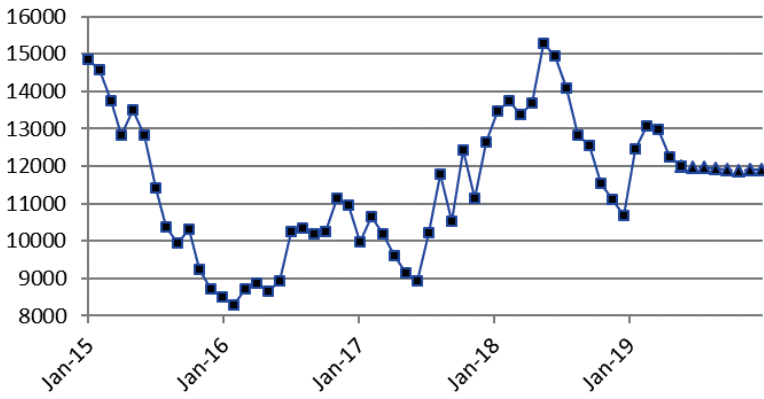

Fig. 35. The nickel price ($ per ton)

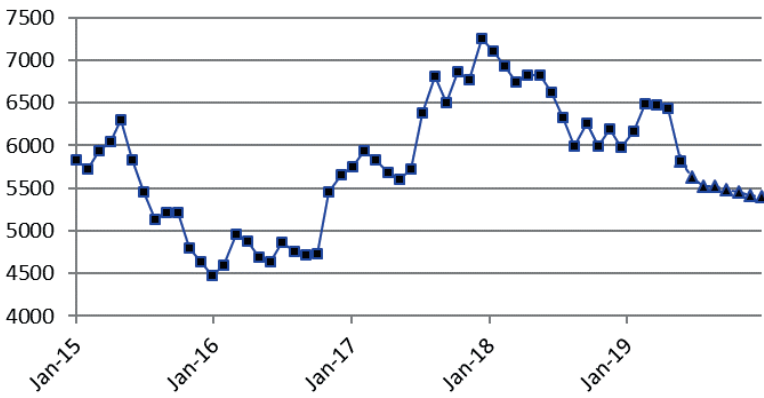*Fig. 36. The copper price ($ per ton)*

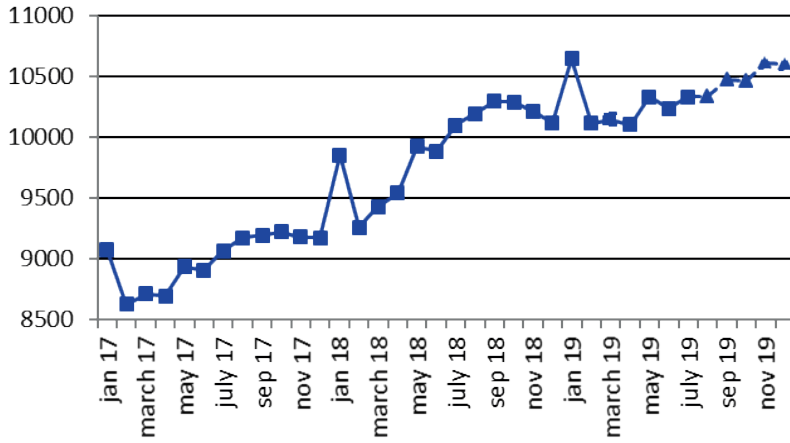*Fig. 37. The monetary base, billion RUB*

Fig. 38. M2, billion RUB
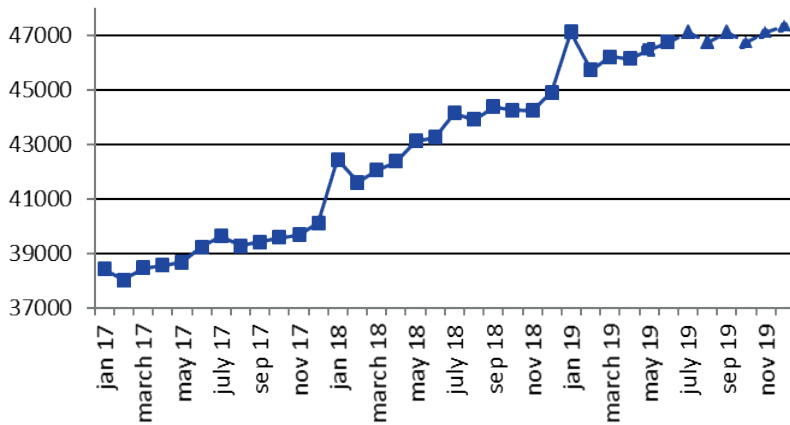
Fig. 39. The international reserves of the Russian Federation, million USD
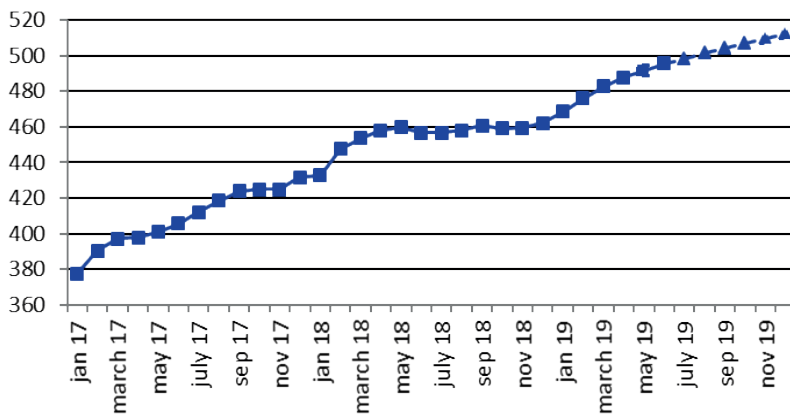
Fig. 40. The RUB/USD exchange rate
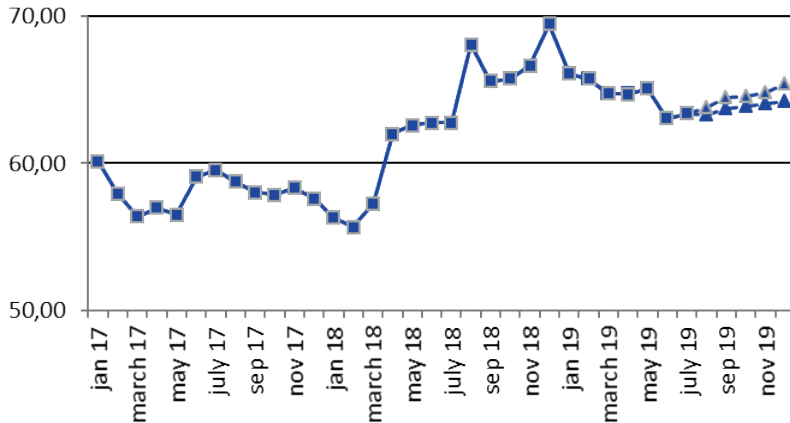
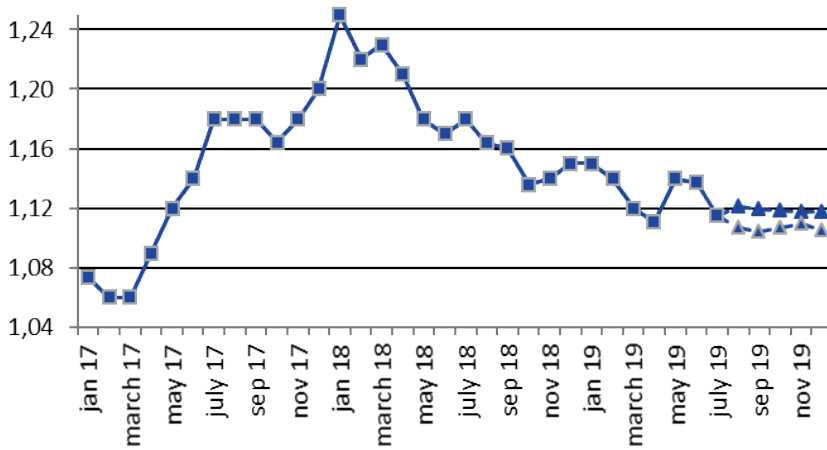*Fig. 41. The USD/EUR exchange rate*

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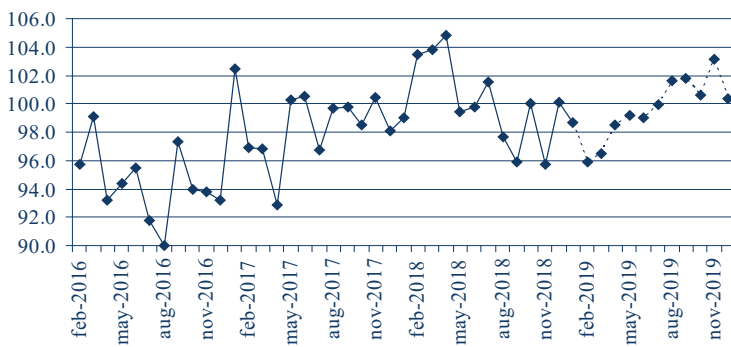in the same period of the previous year)*

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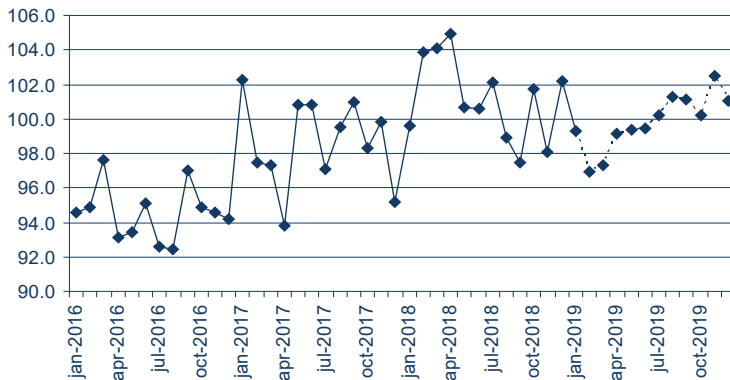in the same period of the previous year)*

*Fig. 44. Real accrued wages (as a percentage of those
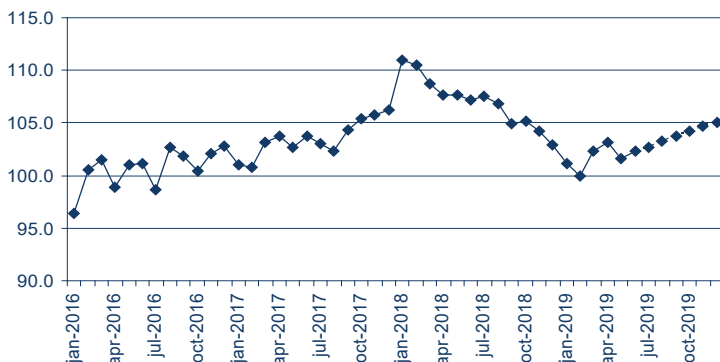in the same period of the previous year)*
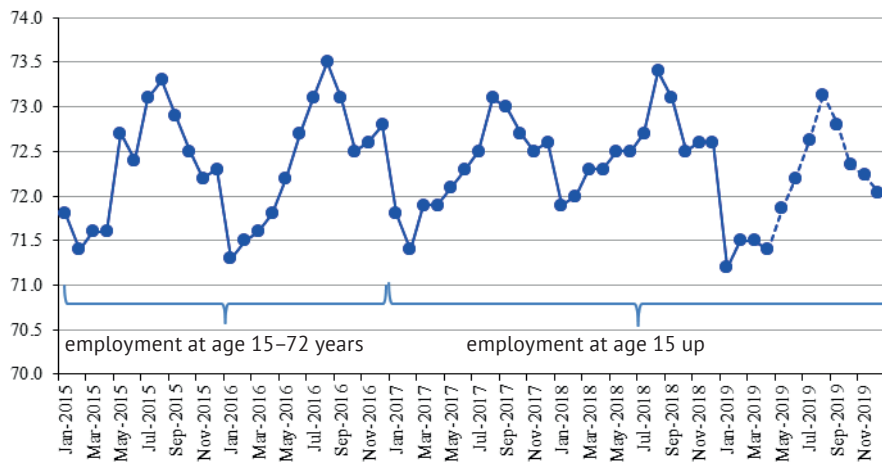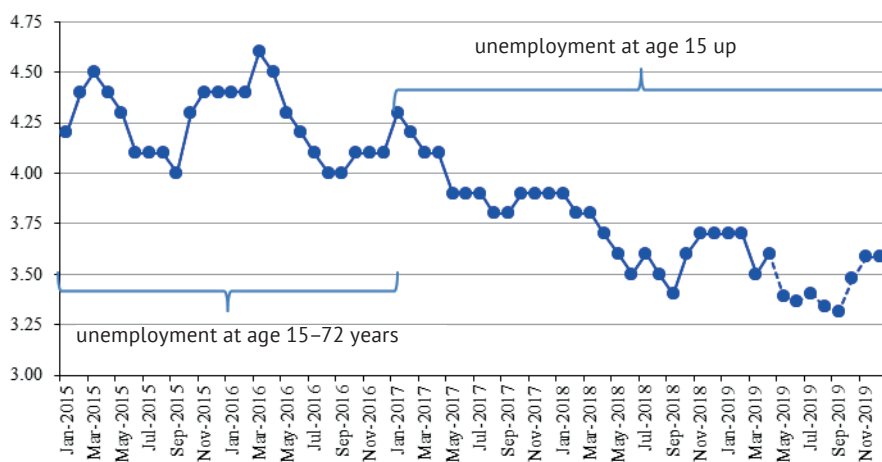
Fig. 45. Employment (million people)

Fig. 46. Unemployment (million people)

Model calculations of short-term forecasts of social and economic indices of the Russian Federation: June 2019

Index	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19
Rosstat IIIP (growth rate, %)*	**4.6**	3.2	2.9	2.9	1.8	2.6	1.9	1.9	2.8
HSE IIP (growth rate %)*	**3.1**	**-0.3**	2.0	2.2	1.3	2.6	1.8	1.8	2.5
Rosstat IIP for mining (growth rate, %)*	**4.2**	4.1	2.5	1.5	0.9	-0.5	-0.2	0.5	1.2
HSE IIP for mining (growth rate, %)*	**3.9**	**2.0**	1.6	0.3	0.2	0.9	0.8	1.0	0.9
Rosstat IIIP for manufacturing (growth rate, %)*	**4.7**	1.9	1.6	2.5	2.3	2.1	1.0	3.2	2.1
HSE IIP for manufacturing (growth rate, %)*	**3.2**	**-1.8**	0.4	1.5	-0.1	2.5	-0.7	0.3	-0.9
Rosstat IIP for utilities (electricity, water, and gas) (growth rate, %)*	**1.0**	2.4	3.9	2.6	2.6	4.6	4.7	1.3	-1.2
HSE for utilities (electricity, water, and gas) (growth rate, %)*	**-0.2**	**0.1**	1.0	2.0	1.7	2.4	6.0	0.6	-1.2
Rosstat IIP for food products (growth rate, %)*	**7.6**	5.3	3.9	3.8	2.4	3.0	1.7	1.5	2.6
HSE IIP for food products (growth rate, %)*	**3.6**	**0.4**	3.0	3.0	2.3	2.1	0.4	3.2	6.4
Rosstat IIP for coke and petroleum (growth rate, %)*	**4.3**	-0.8	-1.0	-2.9	-1.6	-1.0	1.1	-0.8	-2.6
HSE for coke and petroleum (growth rate, %)*	**3.1**	**-5.9**	-5.5	-5.7	-0.4	-4.5	-2.7	-5.1	-5.3
Rosstat for primary metals and fabricated metal products (growth rate, %)*	**-5.5**	-3.1	14.8	2.9	4.5	6.5	-3.5	1.0	7.1
HSE IIP for primary metals and fabricated metal products (growth rate, %)*	**-0.7**	**0.8**	3.2	1.8	-2.6	-2.8	-3.0	-3.4	-1.0
Rosstat IIP for machinery (growth rate, %)*	**-5.8**	-21.6	-11.8	-4.3	-6.9	-8.3	-2.0	4.9	3.5
HSE IIP for machinery (growth rate %)*	6.0	**9.4**	13.1	8.7	3.7	1.7	3.5	-0.8	-17.3
Retail sales, trillion Rb	2.65	2.69	**2.73**	2.80	2.90	2.87	2.90	2.91	3.48
Real retail sales (growth rate, %)*	1.6	1.4	**1.4**	0.7	1.2	1.3	2.2	1.9	2.2

Index	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19
Export to all countries (billion $)	**35.7**	**31.6**	35.6	34.8	38.8	38.8	40.4	41.9	43.4
Export to countries outside the CIS (billion $)	**30.6**	**27.2**	29.0	28.8	33.4	34.5	35.4	35.9	37.9
Import from all countries (billion $)	**22.0**	**19.8**	22.4	21.9	22.0	21.5	22.0	22.2	23.3
Import from countries outside the CIS (billion $)	**19.6**	**17.5**	20.2	19.7	20.2	19.3	19.6	19.7	21.0
CPI (growth rate, %)**	**0.3**	**0.3**	0.3	0.5	0.2	0.4	0.4	0.4	0.5
PPI for industrial goods (growth rate, %)**	**0.5**	0.4	0.7	0.6	0.8	0.8	0.9	0.3	0.1
PPI for mining (growth rate, %)**	**0.7**	-2.5	-0.5	1.0	-0.1	-0.2	0.0	-0.4	-1.4
PPI for manufacturing (growth rate, %)**	**0.5**	1.2	0.7	0.1	0.2	0.5	0.6	0.6	0.0
PPI for utilities (electricity, water, and gas) (growth rate, %)**	**-0.3**	0.4	-0.6	0.7	2.2	0.5	0.6	-0.1	-0.1
PPI for food products (growth rate, %)**	**0.0**	0.1	0.1	0.8	0.4	0.7	0.6	0.2	0.4
PPI for the textile and sewing industry (growth rate, %)**	**0.5**	0.4	0.4	0.3	0.7	0.2	0.7	0.5	0.4
PPI for wood products (growth rate, %)**	**-0.7**	-0.3	0.2	0.6	0.7	0.3	0.7	0.4	0.0
PPI for the pulp and paper industry (growth rate, %)**	**0.0**	0.1	-0.4	0.0	0.3	0.2	0.1	0.3	0.1
PPI for coke and petroleum (growth rate, %)**	**1.1**	2.1	2.3	2.4	2.6	2.6	2.4	2.4	-1.6
PPI for the chemical industry (growth rate, %)**	**0.3**	0.9	0.7	1.1	0.9	0.8	0.7	1.2	0.3
PPI for primary metals and fabricated metal products (growth rate, %)**	**2.2**	1.3	-0.1	1.1	0.3	1.2	1.3	0.7	0.5
PPI for machinery (growth rate, %)**	**0.0**	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3
PPI for transport equipment manufacturing (growth rate, %)**	0.6	0.9	1.0	0.6	-0.3	0.1	0.9	0.4	0.8
The cost of the monthly per capita minimum food basket (thousand Rb)	4.24	**4.36**	**4.37**	4.30	4.23	4.20	4.19	4.21	4.27
The composite index of transportation tariffs (growth rate, %)**	**-0.1**	**0.0**	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
The index of pipeline tariffs (growth rate, %)**	**12.7**	**0.1**	-1.7	1.5	3.2	-0.1	-1.4	1.9	2.7
The index of motor freight tariffs (growth rate, %)**	**5.0**	**0.0**	0.0	3.3	0.0	0.0	-4.5	-0.1	-0.1
The Brent oil price ($ a barrel)	**72.8**	**64.5**	62.5	58.0	53.1	50.9	51.4	51.7	49.1
The aluminum price (thousand $ a ton)	**1.77**	**1.78**	1.77	1.75	1.73	1.74	1.74	1.73	1.73
The gold price (thousand $ per ounce)	**1.29**	**1.28**	1.29	1.30	1.30	1.30	1.31	1.32	1.33
The nickel price (thousand $ a ton)	**6.43**	**5.82**	5.63	5.52	5.52	5.49	5.46	5.42	5.40
The copper price (thousand $ a ton)	12.2	12.0	12.0	12.0	11.9	11.9	11.9	11.9	11.9
The monetary base (trillion Rb)	10.1	10.3	10.2	10.3	10.3	10.5	10.5	10.6	10.6
M_2 (trillion Rb)	**46.1**	**46.4**	**46.7**	47.1	46.7	47.1	46.7	47.1	47.3
Gold and foreign exchange reserves (billion $)	**0.49**	**0.49**	**0.50**	0.50	0.50	0.50	0.51	0.51	0.51
The RUR/USD exchange rate (rubles per one USD)	64.69	65.06	63.08	63.42	63.56	64.13	64.23	64.44	64.82
The USD/EUR exchange rate (USD per one Euro)	**1.11**	**1.14**	**1.11**	1.12	1.12	1.11	1.12	1.12	1.11
Real disposable cash income (growth rate, %)*	4.8	-0.6	-0.2	1.5	-2.3	-4.1	0.0	-4.3	0.1
Real cash income (growth rate, %)*	-0.8	-0.6	-0.6	0.2	1.3	1.1	0.2	2.5	1.1
Real accrued wages (growth rate, %)*	**3.1**	**1.6**	**2.3**	2.7	3.3	3.8	4.2	4.7	5.1
Employment (million people)	**71.4**	71.9	72.2	72.6	73.1	72.8	72.4	72.2	72.0
Unemployment (million people)	3.6	3.4	3.4	3.4	3.4	3.3	3.5	3.5	3.5

Note. Actual values are printed in the bold type

* % of the respective month of the previous year;

** % of the previous month.

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