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 *January* 2020 to *June* 2020[1], which were performed using time series models developed as a result of research conducted by the Gaidar Institute over the past few years.[2] 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[3], 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.[4]

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] Given that from early 2019 Rosstat does not release monthly data on indexes of real disposable cash income of the population, commencing from issue 8/2019 we release forecasts in quarter terms for 2 quarters ahead.

[2] 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.

[3] Ibid.

[4] See.: Perron, P. Further Evidence on Breaking Trend Functions in Macroeconomic Variables, *Journal of Econometrics*, 1997, 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, 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 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 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 January to June 2020, the series of monthly data of the indexes of industrial production released by the Federal State Statistics Service (Rosstat) from January 2002 to October 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 November 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 industrial production indexes 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.F. Baranov and V.A. Bessonov.

Table 1
Calculations of forecast values of the industrial production indexes[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																		
Jan 20	2.8	1.3	1.9	1.8	0.9	0.4	3.0	1.4	1.5	-0.8	4.8	5.5	1.5	0.4	2.1	-1.9	-2.4	1.7
Feb 20	2.0	1.1	1.9	1.4	0.5	0.9	1.6	2.4	1.3	0.3	2.4	4.4	2.4	0.7	-2.6	1.9	-15.3	-5.5
Mar 20	2.4	2.0	3.2	2.2	0.4	0.9	2.8	5.2	1.1	1.0	4.2	3.2	2.4	3.4	8.5	1.0	-8.7	-5.1
Apr 20	1.7	1.7	2.9	1.9	0.1	1.1	1.5	1.9	0.9	0.1	2.2	3.2	5.1	0.5	4.8	-2.6	-2.9	-5.4
May 20	2.3	0.8	0.6	0.8	1.0	1.0	3.1	4.5	0.6	1.1	3.1	4.2	3.6	5.7	-1.8	-0.7	-4.0	0.8
Jun 20	1.9	2.5	0.0	2.9	0.8	1.2	1.7	3.4	1.1	1.6	5.2	4.5	2.5	3.3	0.0	-2.4	-5.9	-7.6
For reference: actual growth in 2019 on the respective month of 2018																		
Jan 19		1.1	2.3		4.8	4.3	-1.0	1.2	1.3	1.1	2.8	-1.7	1.2	1.2	2.3	2.2	-10.6	4.8
Feb 19		4.1	3.4		5.1	4.2	4.6	4.3	-1.1	-2.7	7.7	2.5	5.2	3.9	10.3	1.7	5.7	24.4
Mar 19		1.2	0.3		4.3	4.1	0.3	-0.5	-4.8	-7.0	3.3	1.1	-0.4	-1.9	-6.4	-0.3	3.3	3.5
Apr 19		4.6	3.1		4.2	3.9	4.7	3.2	1.0	-0.2	7.6	3.7	4.3	3.1	-5.5	-0.7	-5.8	6.0
May 19		0.9	-0.2		2.8	2.3	-1.0	-1.5	1.8	-0.7	1.1	1.4	-4.3	-5.9	0.0	1.0	-10.0	8.3
Jun 19		3.3	0.7		2.3	1.4	3.4	0.3	2.5	0.3	0.6	0.9	-4.8	-5.3	14.6	0.9	-4.5	9.1

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] growth in the industrial production index in January-June 2020 compared to the same period of the previous year for the industry as a whole comes to 1.9%. The NRU HSE industrial production index also comes to 1.8%.

The average monthly gain in the Rosstat and the NRU HSE industrial production indexes for mining and quarrying amount to 0.6% and 0.9%, respectively in January-June 2020.

The average gain in the Rosstat industrial production index in manufacturing industry for H1 2020 amounts to 2.3% compared to the same period of the previous year and the NRU HSE industrial production index in manufacturing industry comes to 3.1%. The average monthly increase in production of food products to average by 3.7% and 4.1% for the Rosstat and NRU HSE indexes, respectively. The production of coke and petroleum products is forecast to grow on average by 2.9% and 2.3% for the Rosstat and NRU HSE indexes, respectively. The average monthly change in the industrial production index for primary metals and fabricated metal products for January-June 2020 computed by Rosstat and the NRU HSE constitutes 1.8% and (-0.8%), respectively. Manufacturing of machinery and equipment is forecast to grow on average by (-6.5%) and (-3.5%) for the Rosstat and the NRU HSE indexes, respectively.

The average gain in the Rosstat industrial production index for electricity, gas, and steam supply; for air conditioning for H1 2020 constitutes 1.1% in comparison with the same period of the previous year; the same indicator for the NRU HSE industrial production index comes to 0.6%.

Increase in the Rosstat industrial production indexes will average 1.9% (by types of economic activity) in 2019, and the NRU HSE industrial production indexes – (-0.6%).

Retail Sales

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

As seen from *Table 2,* the average forecast increment in the monthly turnover for January-June 2020 against the corresponding period of 2019 amounts to around 4.6%. The average forecast growth in the monthly real turnover for the period January-June 2020 compared to the same period of 2019 constitutes 0.9%.

FOREIGN TRADE INDEXES

Model calculations of forecast values of the export, export to countries outside the CIS and the import, 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 November 2019 on the basis of the data released by the Central Bank of Russia.[2] The results of calculations are presented 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)
Jan 20	2621.2 (4.7)	101.5
Feb 20	2560.9 (4.6)	100.5
Mar 20	2793.3 (4.6)	100.3
Apr 20	2771.0 (4.5)	100.4
May 20	2816.6 (4.6)	101.7
Jun 20	2863.1 (4.7)	101.1
For reference: actual values in the same months of 2019		
Jan 19	2502.8	102.7
Feb 19	2448.0	102.0
Mar 19	2670.2	102.1
Apr 19	2650.5	107.1
May 19	2692.9	101.8
Jun 19	2735.0	101.5

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

Export, import, export outside the CIS and import from the countries outside the CIS are forecast to grow on average at 12.1%, 8.9%, 17.1%, and 5.3%, respectively for January-June 2020 against January-June 2019. The average forecast trade balance volume with all countries for January-June 2020 will total $100.7 bn, which corresponds to an increase by 16.5% in relation to January-June 2019.

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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
Jan 20	35.6	36.3	116	118	19.8	18.3	121	111	31.0	32.4	114	119	16.4	15.8	112	108
Feb 20	36.1	37.8	104	109	20.6	20.7	113	113	32.9	36.0	108	119	17.9	16.8	110	104
Mar 20	39.9	40.3	108	109	22.1	22.6	105	108	35.3	35.9	110	112	19.6	18.4	105	98
Apr 20	38.5	40.1	105	109	21.6	23.0	98	104	34.7	35.8	110	113	19.3	19.0	98	97
May 20	37.9	38.0	118	118	22.8	21.5	114	108	34.0	36.6	122	132	19.9	18.6	113	105
Jun 20	38.1	39.1	116	119	21.4	22.0	107	110	34.7	35.8	124	128	20.0	18.4	113	104
For reference: actual values in respective months of 2019 (billion USD)																
Jan 19	30.8				16.4				27.2				14.6			
Feb 19	34.7				18.2				30.3				16.2			
Mar 19	37.0				21.0				32.2				18.7			
Apr 19	36.7				22.1				31.6				19.7			
May 19	32.2				20.0				27.8				17.7			
Jun 19	32.8				20.0				28.0				17.7			

Note. Over the period from January 1999 to November 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)	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
								Producer price indexes:										
Forecast values (% of the previous month)																		
Jan 20	101.3	100.3	100.4	100.1	100.3	100.2	103.1	100.1	99.9	100.2	100.5	100.0	100.7	97.3	100.4	100.7	101.5	100.1
Feb 20	100.6	100.2	100.4	100.5	100.5	100.5	102.3	100.7	101.5	99.9	100.5	100.8	100.0	103.4	100.3	101.2	100.9	100.1
Mar 20	100.5	100.3	100.4	100.8	100.4	100.6	99.8	100.3	100.5	100.3	100.4	100.4	100.2	102.3	99.7	99.7	100.3	100.3
Apr 20	100.5	100.2	100.4	100.3	100.5	100.6	94.8	100.5	99.5	100.4	100.4	100.3	100.6	102.9	99.4	100.6	100.3	100.7
May 20	100.5	100.2	100.4	100.6	100.4	100.5	100.6	100.5	100.5	100.6	100.5	100.4	100.2	102.3	99.4	101.3	100.3	100.8
Jun 20	100.2	100.2	100.4	99.8	100.4	100.6	99.1	100.4	99.4	100.5	100.3	100.5	100.5	102.5	99.6	101.2	100.4	100.7
Forecast values (% of December 2019)																		
Jan 20	101.3	100.3	100.4	100.1	100.3	100.2	103.1	100.1	99.9	100.2	100.5	100.0	100.7	97.3	100.4	100.7	101.5	100.1
Feb 20	102.0	100.5	100.8	100.6	100.8	100.7	105.5	100.8	101.5	100.0	101.0	100.8	100.6	100.6	100.7	101.9	102.4	100.2
Mar 20	102.4	100.8	101.2	101.4	101.2	101.3	105.2	101.1	101.9	100.3	101.5	101.2	100.9	103.0	100.4	101.6	102.7	100.5
Apr 20	103.0	101.0	101.6	101.7	101.7	101.9	99.8	101.6	101.4	100.7	101.9	101.5	101.5	106.0	99.7	102.2	103.1	101.2
May 20	103.5	101.2	102.0	102.3	102.1	102.4	100.4	102.1	101.9	101.3	102.3	101.9	101.7	108.4	99.1	103.5	103.4	102.0
Jun 20	103.7	101.4	102.4	102.2	102.5	103.0	99.4	102.5	101.3	101.8	102.6	102.3	102.2	111.1	98.7	104.7	103.8	102.7
For reference: actual values in the same periods of 2019 (% of December 2018)																		
Jan 19		101.0			98.0		95.9	98.6	99.1	100.3	100.5	100.4	101.6	90.9	99.8	98.7	101.2	101.0
Feb 19		101.4			98.1		97.3	98.0	100.4	100.4	100.5	101.7	101.4	88.4	99.1	97.9	101.6	101.3
Mar 19		101.7			99.0		101.2	97.6	101.0	99.2	100.4	101.5	101.5	86.9	97.9	98.5	101.9	100.9
Apr 19		102.0			99.5		101.9	98.1	100.7	99.2	100.9	100.8	101.5	87.8	98.2	100.7	101.9	101.5
May 19		102.3			101.3		104.9	99.7	101.9	99.1	101.0	100.4	100.3	94.7	98.6	100.6	101.9	102.6
Jun 19		102.3			100.7		103.1	99.7	100.9	99.0	100.9	100.0	99.9	94.8	98.3	100.5	102.0	103.3

Note. Over the period from January 1999 to October 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.

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 October 2019.[1] Table 4 presents the results of model calculations of forecast values over January to June of 2020 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 H1 2020 will come to 0.4%. The producer price index for industrial goods for the same period is forecast to grow on average 0.4% per month.

The Rosstat producer price indexes are forecast to grow at average monthly rate for January-June 2020: for mining and quarrying (-0.1%), manufacturing 0.4%, utilities (electricity, gas, and steam) 0.2%, food products 0.3%, textile and sewing industry 0.4%, wood products 0.4%, pulp and paper industry 0.4%, coke and refined petroleum 1.8%, for chemical industry (-0.2%), for basic metals and fabricated metal 0.8%, for machinery and equipment 0.6%, and for motor vehicles manufacture 0.4%.

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 January to June 2020. The forecasts were made on the basis of time series with the use of the Rosstat data over the period from January 2000 to December 2019. The results are presented 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 level of the previous year. Having said that, the minimum set of food products is forecast to average RUB 4,252.7. The minimum set of food products' cost is forecast to grow on average at around 0.8% against the same period of last year.

Indexes of Freight Rates

This section presents calculations of forecast values of freight tariff indexes on cargo carriage,[2] made on the basis of time-series models evaluated on the Rosstat data over the period from September 1998 to November 2019. Table 6 shows the results of model calculations of forecast values in the first half-year of 2020. 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.

Table 5

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

Forecast values according to ARIMA-model (RUB)	
Jan 20	4111.0
Feb 20	4152.6
Mar 20	4214.8
Apr 20	4268.6
May 20	4371.5
Jun 20	4397.4
For reference: actual values in the same months of 2019 (billion RUB)	
Jan 19	4065.7
Feb 19	4103.9
Mar 19	4179.8
Apr 19	4242.9
May 19	4356.6
Jun 19	4367.0
Expected growth on the respective month of the previous year (%)	
Jan 20	1.1
Feb 20	1.2
Mar 20	0.8
Apr 20	0.6
May 20	0.3
Jun 20	0.7

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

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[1] Structural models were evaluated in the period from October 1998.
[2] 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).

DYNAMICS OF PRICES

Calculations of forecast values of freight tariffs indexes

	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)			
Jan 20	100.0	101.5	96.8
Feb 20	100.0	99.9	95.8
Mar 20	100.0	99.9	101.7
Apr 20	103.8	99.8	106.7
May 20	99.9	99.8	100.8
Jun 20	99.9	99.8	100.0
Forecast values according to ARIMA-models (% of December of the previous year)			
Jan 20	100.0	101.5	96.8
Feb 20	100.0	101.4	93.7
Mar 20	99.9	101.2	89.8
Apr 20	103.7	101.1	91.4
May 20	103.7	100.9	97.4
Jun 20	103.6	100.7	98.2
For reference: actual values in the same period of 2019 (% of the previous month)			
Jan 19	97.6	100.1	90.5
Feb 19	100.3	102.0	99.9
Mar 19	100.0	100.1	99.8
Apr 19	105.0	99.9	112.7
May 19	100.0	100.0	100.1
Jun 19	99.9	100.0	99.9

Note. Over the period from September 1998 to November 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 to November 2019, too; fictitious variables for taking into account particularly dramatic fluctuations were used in respect of all the series.

Calculations of forecast values of world prices on natural resources

	Brent oil ($ per barrel)	Alumi-num ($ per ton)	Gold ($ per ounce)	Copper ($ per ton)	Nickel ($ per ton)
Forecast values					
Jan 20	62.34	1769	1519	5870	17238
Feb 20	63.04	1789	1541	5870	17276
Mar 20	63.84	1807	1541	5847	17847
Apr 20	64.60	1804	1541	5828	17620
May 20	65.38	1809	1558	5826	17798
Jun 20	66.24	1820	1578	5840	17912
Expected growth on the respective month of the previous year (%)					
Jan 20	15.9	-2.9	21.8	-1.9	61.4
Feb 20	1.9	-5.9	19.3	-4.8	38.6
Mar 20	-3.3	-4.6	16.7	-9.8	36.6
Apr 20	-5.5	-5.1	18.4	-10.0	35.6
May 20	-10.2	2.0	21.1	-9.4	45.5
Jun 20	2.7	2.4	22.9	0.3	49.4
For reference: actual values in the same period of 2019					
Jan 19	53.8	1823	1248	5981	10678
Feb 19	61.89	1901	1292	6165	12468
Mar 19	66.03	1895	1320	6483	13063
Apr 19	68.39	1900	1301	6476	12995
May 19	72.8	1773	1286	6433	12235
Jun 19	64.49	1778	1284	5823	11990

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

According to the forecast for January-June 2020, the composite index of transport tariffs on freight carriage will be growing at an average monthly rate of 0.6%. In April 2020, seasonal growth in the index is expected at 3.8 p.p.

The index of motor freight tariffs will be increasing during these six months at an average monthly rate of 0.1%. The index of pipeline tariffs will be growing at an average monthly rate of 0.3%. In April 2020, seasonal growth in the index is expected at 6.7 p.p.

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 January to June 2020 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 November 2019.

The crude oil price is forecast to average around $66.6 per barrel, which is above its corresponding year-earlier indexes on average by 0.1%. The aluminum prices are forecast to average around $1,819 per ton and their average forecast decline constitutes around 1% compared to the same level of last year. The gold price is forecast to average $1,521 per ounce. The copper price is forecast to average $5,920 per ton, and prices for nickel – around $14,425 per ton. The average forecast price increase in gold constitutes around 16 %, the average decline in copper prices – around 5%, and the average gain in nickel prices – 14% against the corresponding level of last year.

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 January-June 2020 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 November 2019 for the monetary base and to October 2019 for M_2 monetary. 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 January-June 2020, the monetary base will be growing at an average monthly rate of 0.6%. In January 2020, seasonal adjustment of the monetary base is projected by 4.2%.

In the period under review, M_2 monetary index will be growing at an average monthly rate of 0.3%. In January 2020, the projected seasonal growth in M_2 monetary index will come to 2.5%.

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 October 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 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 January-June 2020, the international reserves will be growing at an average monthly rate of 0.6.

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, %
Jan 20	10980	4.2	50441	2.5
Feb 20	10652	-3.0	50140	-0.6
Mar 20	10716	0.6	50441	0.6
Apr 20	10785	0.6	50141	-0.6
May 20	10853	0.6	50441	0.6
Jun 20	10922	0.6	50141	-0.6
For reference: actual value in the respective months of 2018 (growth on the previous month, %)				
Jan 19	5.2		4.9	
Feb 19	-5.0		-2.9	
Mar 19	0.3		1.1	
Apr 19	-0.4		-0.2	
May 19	2.3		0.6	
Jun 19	-0.9		0.6	

Note. Over the period from October 1998 to December 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 M_2 monetary aggregate from October 1998 to November 2019 was identified as stationary series with explicit seasonal component.

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, %
Jan 20	546.5	0.8
Feb 20	549.7	0.6
Mar 20	551.1	0.3
Apr 20	554.2	0.6
May 20	557.6	0.6
Jun 20	560.8	0.6
For reference: actual values in the same period of 2019		
Jan 19	468.5	1.4
Feb 19	475.9	1.6
Mar 19	482.6	1.4
Apr 19	487.8	1.1
May 19	491.1	0.7
Jun 19	495.2	0.8

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

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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.

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 December 2019 and from February 1999 to December 2019,[1] respectively.

In January-June 2020, USD/RUB average exchange rate is forecast according to two models in the amount of RUB 63.99 per USD.

Projected Euro/USD exchange rate over the period under review will average USD 1.11 per 1 euro.

THE LIVING STANDARD INDEXES

This section (Table 11) presents results of calculations of monthly forecast values of index of real wages, as well as quarterly forecast values of real disposable cash income and real cash income[2] as were obtained on the basis of models of time series of respective indexes computed by Rosstat and taken over the period from January 1999 to November 2019, as well as from Q1 2014 to Q3 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. Consequently, the future values of the indexes of real wages and real disposable cash 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 raise may differ greatly from those which are implemented in reality.

The results presented in *Table 11*, present growth in real wages. The real wages are expected to gain on average at 4.5% compared to the same period of the previous year.

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
Jan 20	63.52	63.52	1.11	1.11
Feb 20	63.71	63.45	1.11	1.12
Mar 20	64.29	63.82	1.11	1.12
Apr 20	64.35	63.82	1.11	1.12
May 20	64.57	64.00	1.11	1.12
Jun 20	64.74	64.09	1.11	1.13
For reference: actual values in the similar period of 2019				
Jan 19	66.10		1.15	
Feb 19	65.76		1.14	
Mar 19	64.73		1.12	
Apr 19	64.69		1.12	
May 19	65.06		1.11	
Jun 19	63.08		1.14	

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

Table 11

The forecast of the real wages

Months	Real accrued wages
Forecast values according to ARIMA-models (as % to the respective month of 2019)	
Jan 20	103.5
Feb 20	103.9
Mar 20	104.3
Apr 20	104.7
May 20	105.1
Jun 20	105.4
For reference: actual values in the respective period of 2019 (as % to the same period of 2018)	
Jan 19	101.1
Feb 19	100.0
Mar 19	102.3
Apr 19	103.1
May 19	101.6
Jun 19	102.9

Note. For calculation purposes, the series of real wages in base form were used (January 1999 was adopted as a base period). Over the period from January 1999 to November 2019 those series were attributed to the class of processes, which are stationary in differences and have an explicit 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 November 2019, and on USD/RUB exchange rate from October 1998 to November 2019. Data for December 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. *The real disposable cash income* – is cash income less mandatory payments and contributions. (See: *Rossiisky Statistichesky Ezhegodnik, Moscow, Rosstat, 2004, p. 212*).

Results presented in *Table 12* project average quarterly decline in real disposable cash income by 1.4% and real cash income by 1.3% compared to the corresponding period of the last year.

At year-end 2019, projected decline in real disposable cash income will come to 1.4%; reduction in real cash income – by 0.4% over 12 months

EMPLOYMENT AND UNEMPLOYMENT

Table 12
The forecast of the living standard indexes

Period	Real disposable cash income	Real cash income
Forecast values according to ARIMA-models (as % to the corresponding quarter of 2018)		
Q4 2019	98.6	98.7
Q1 2020	98.6	98.7
For reference: actual values for the respective period of 2018 (in % to the same period of 2017)		
Q4 2018	98.0	99.5
Q1 2019	97.5	98.6

For the purpose of calculation of the future values of employment (the number of gainfully employed population) and the unemployment (the total number of unemployed), models of the time series evaluated over the period from October 1998 to October 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 gainfully employed population may arise due to the fact that each series is forecast individually and not as a difference between the forecast values of gainfully employed population and another index.

Table 13
Calculation of forecast values of employment and unemployment indexes

	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
Jan 20	71.3	-1.8	3.6	-1.9	5.1	3.5	-5.4	4.9
Feb 20	70.1	-1.5	3.7	-0.5	5.3	3.5	-5.4	5.0
Mar 20	70.3	-1.7	3.7	-0.7	5.2	3.5	0.0	5.0
Apr 20	70.5	-1.4	3.6	2.4	5.1	3.5	-2.8	5.0
May 20	70.5	-1.2	3.6	0.5	5.1	3.5	2.9	5.0
Jun 20	70.8	-1.1	3.4	1.0	4.8	3.4	4.0	4.8
For reference: actual values in the same periods of 2019 (million people)								
Jan 19	72.6		3.7					
Feb 19	71.2		3.7					
Mar 19	71.5		3.7					
Apr 19	71.5		3.5					
May 19	71.4		3.6					
Jun 19	71.6		3.4					

Note. Over the period from October 1998 to October 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.

According to ARIMA-model forecast (*Table 13*), in H1 2020, the decrease in the number of employed in the economy will average 1.5% per month against the corresponding period of the previous year.

The average decrease in the total number of unemployed is forecast at 0.5% per month against the same period of last year.

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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 September 2019.
[3] For example, deemed as such a difference may be a simultaneous decrease both in employment and 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 gainfully employed population.

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)
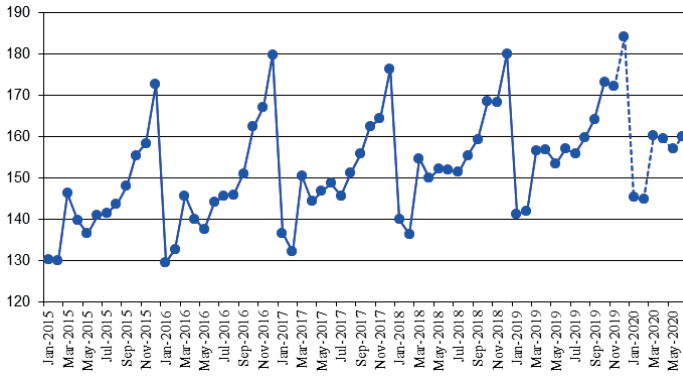
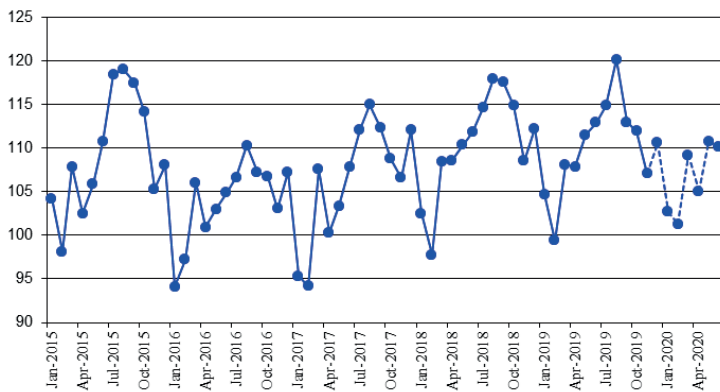*Fig. 1b. The NRU HSE industrial production index (ARIMA-model)*
(% of January 2010)
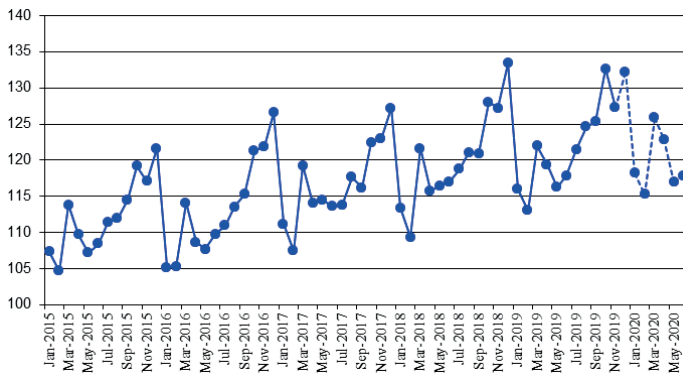
Fig. 2a. The Rosstat industrial production index for mining
(% of December 2001)
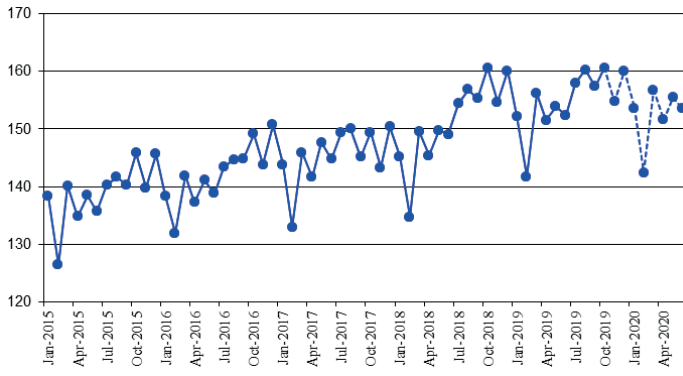
Fig. 2b. The NRU HSE industrial production index for mining
(% of January 2010)
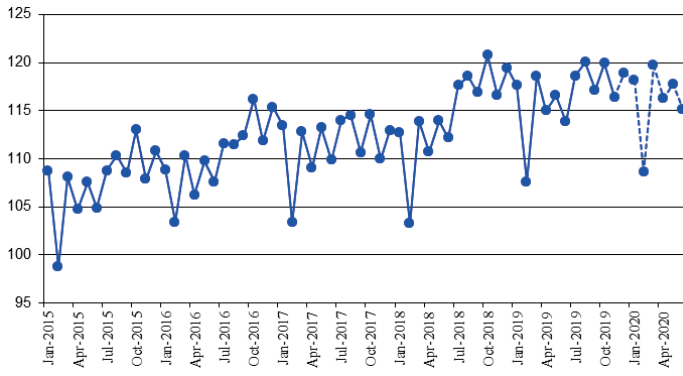
Fig. 3a. The Rosstat industrial production index for manufacturing
(% of December 2001)
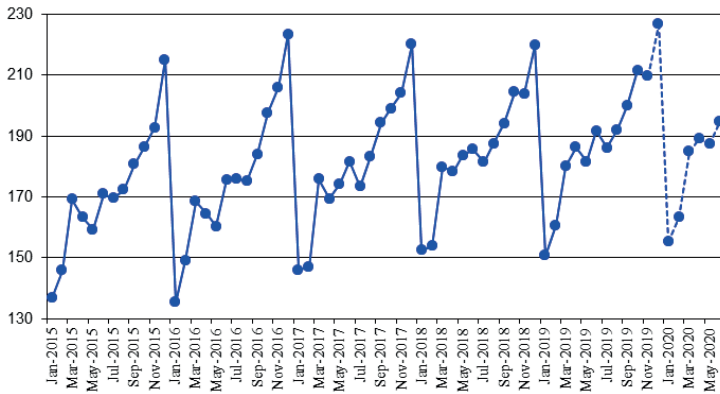
Fig. 3b. The NRU HSE industrial production index for manufacturing
(% of January 2010)
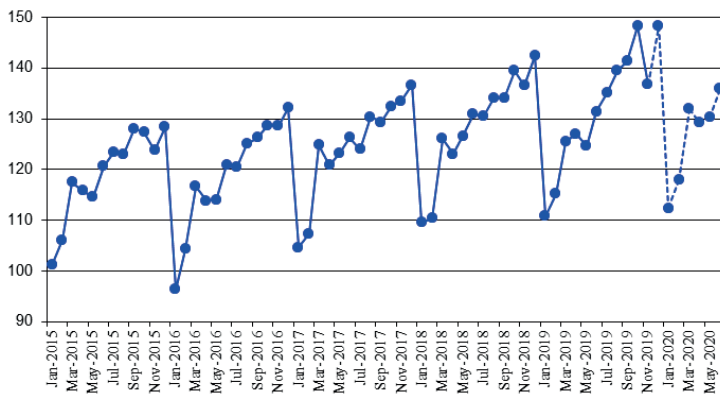
Fig. 4a. The Rosstat industrial production index for utilities (electricity, water, and gas)
(as a percentage of that in December 2001)
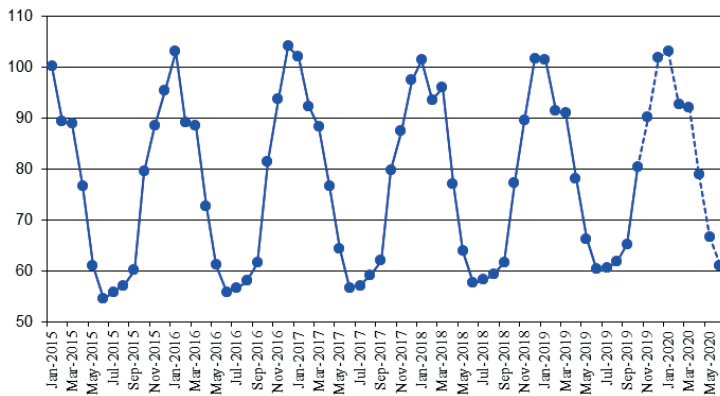
Fig. 4b. The NRU HSE industrial production index for utilities (electricity, water, and gas)
(as a percentage of that in January 2010)
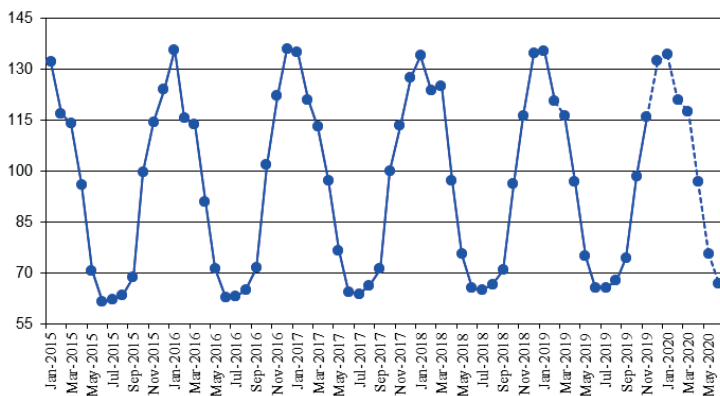
Fig. 5a. The Rosstat industrial production index for food products (as a percentage of that in December 2001)
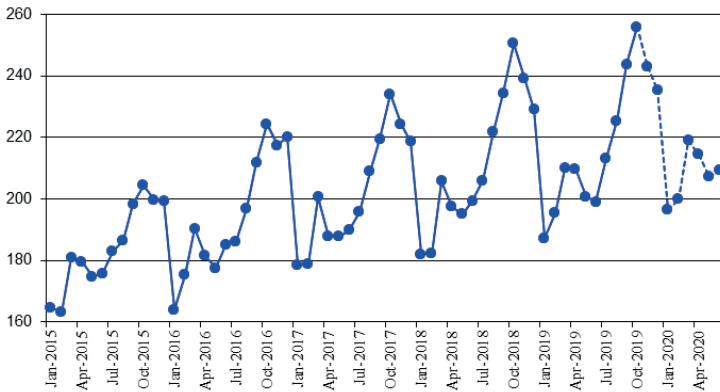
Fig. 5b. The NRU HSE industrial production index for food products (as a percentage of that in January 2010)
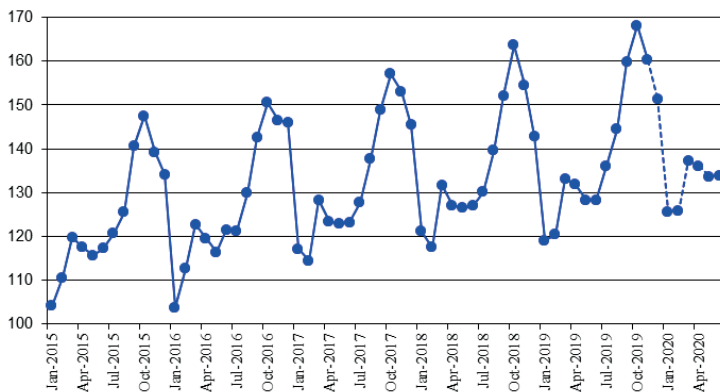
Fig. 6a. The Rosstat industrial production index for coke and petroleum (as a percentage of that in December 2001)
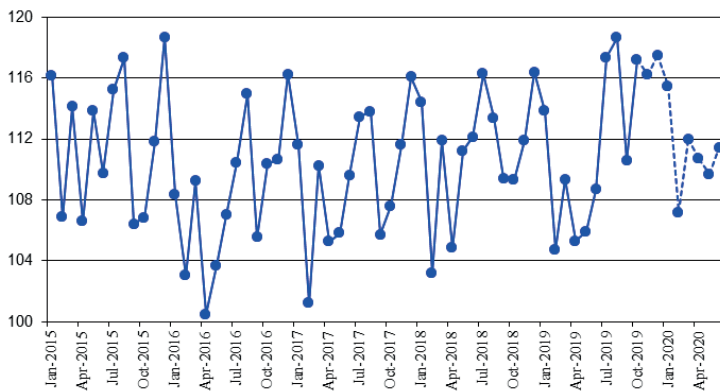
Fig. 6b. The NRU HSE industrial production index for petroleum and coke (as a percentage of that in January 2010)
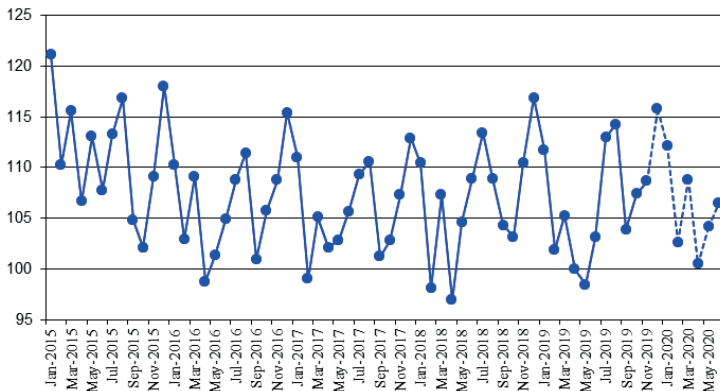
Fig.7a. The Rosstat industrial production index for primary metals and fabricated metal products (as a percentage of that in December 2001)
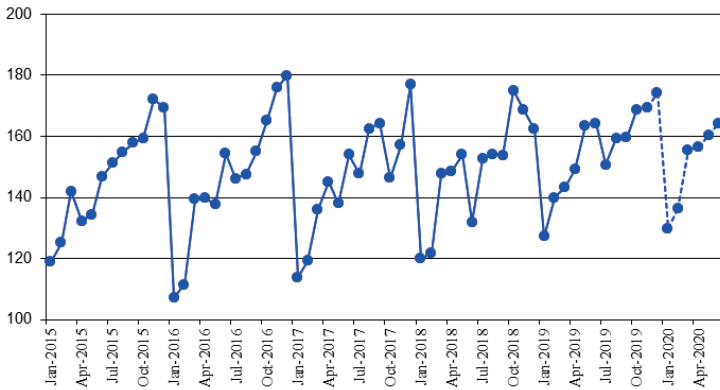
Fig. 7b. The NRU HSE industrial production index for primary metals and fabricated metal products (as a percentage of that in January 2010)

Fig. 8a. The Rosstat industrial production index for machinery (as a percentage of that in December 2001)
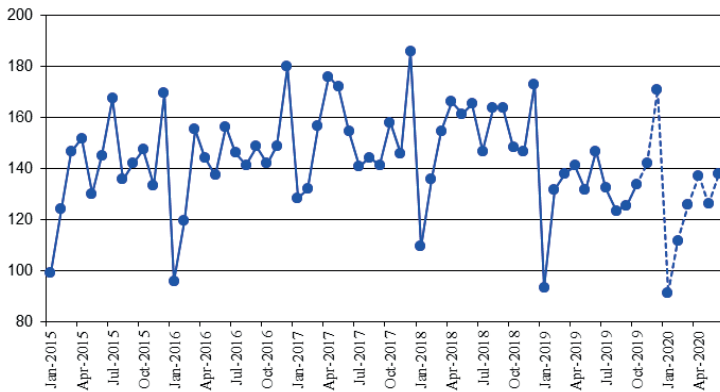
Fig. 8b. The NRU HSE industrial production index for machinery (as a percentage of that in January 2010)
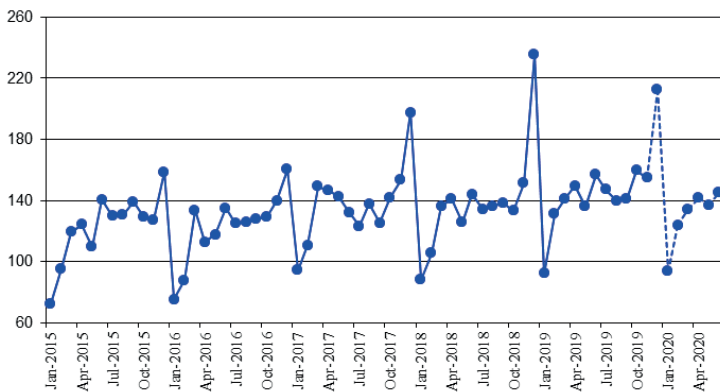
Fig. 9. The volume of retail sales (billion RUB)
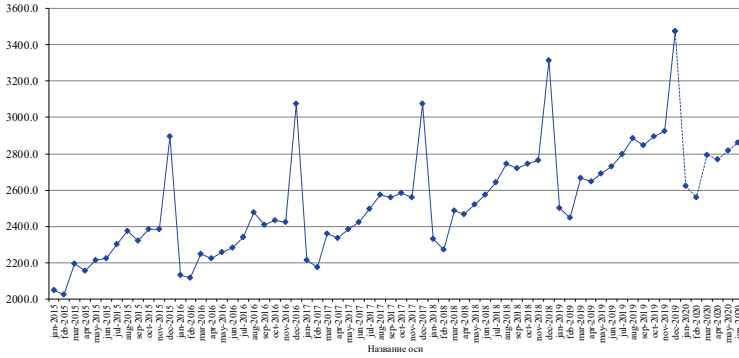
Fig. 9a. The real volume of retail sales (as a percentage of that in the same period of the previous year)
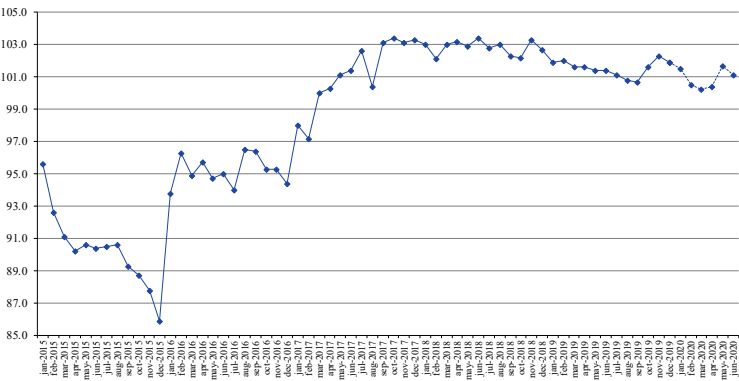
Fig.10. Export to all countries (billion USD)
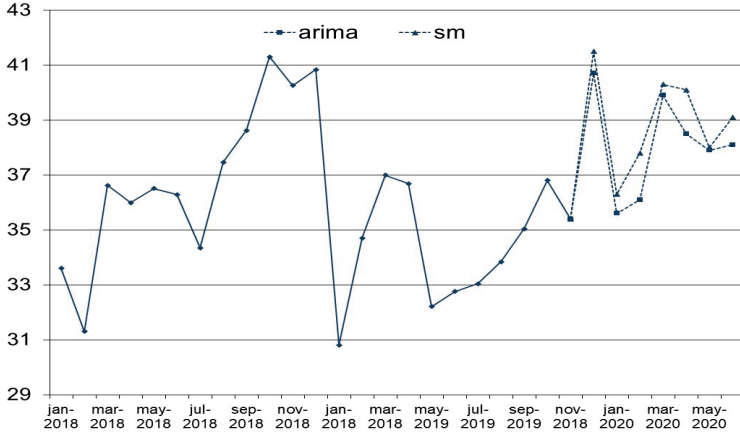
Fig. 11. Export to countries outside the CIS (billion USD)
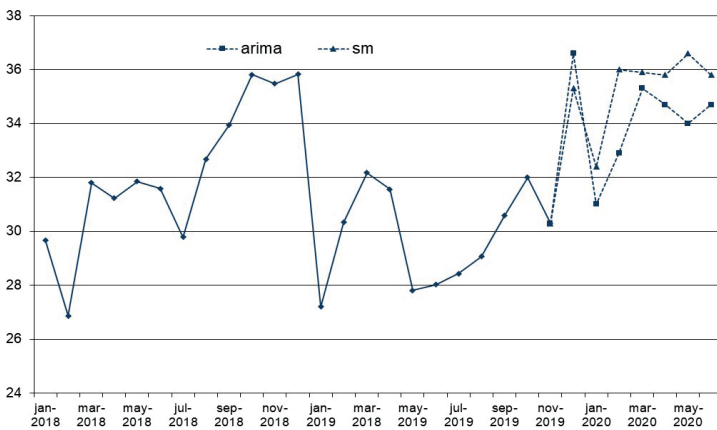
Fig. 12. Import from all countries (billion USD)
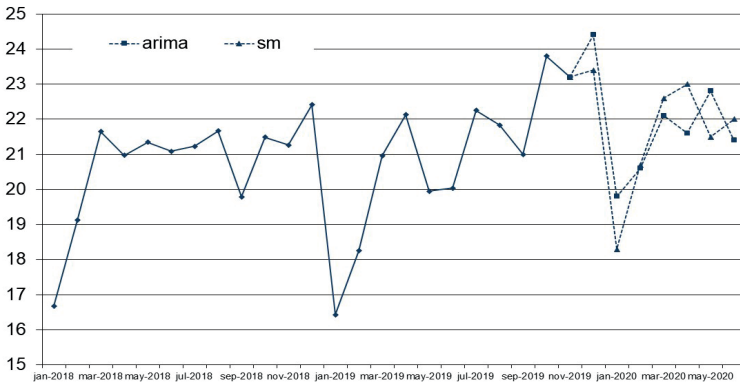
Fig. 13. Import from countries outside the CIS (billion USD)
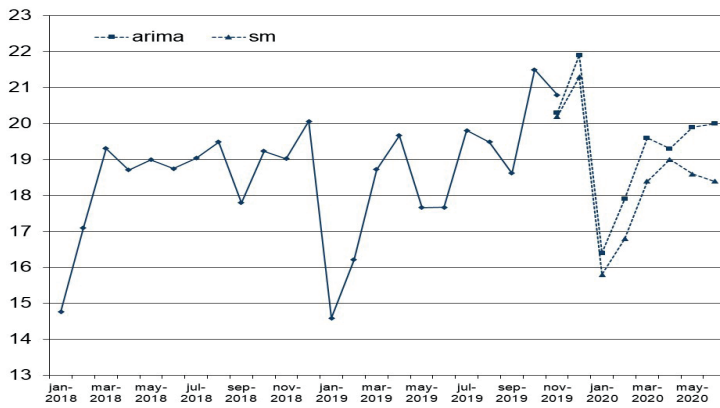
Fig. 14. The consumer price index (as a percentage of that in December of the previous year)
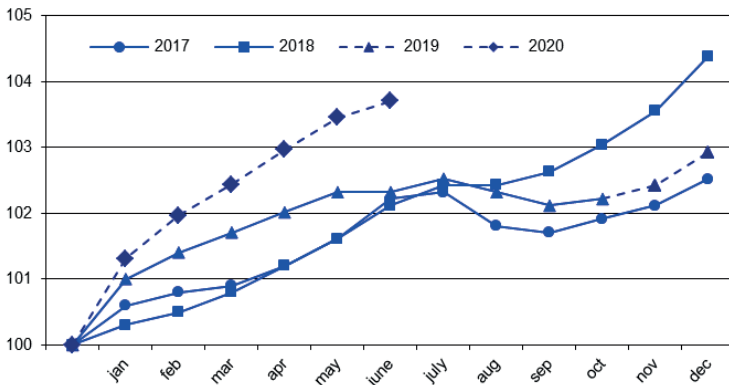
Fig. 14a. The consumer price index (as a percentage of that in December of the previous year) (SM)
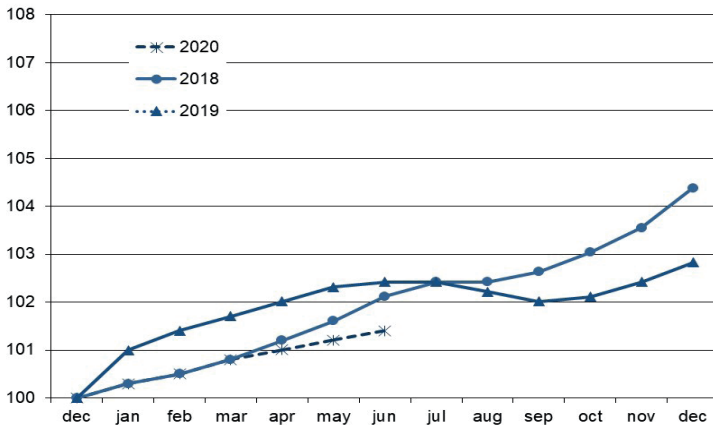
Fig.15. The producer price index for industrial goods
(as a percentage of that in December of the previous year)
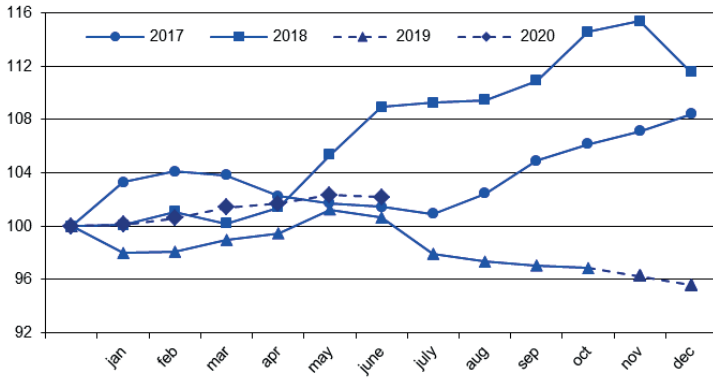
Fig. 16. The price index for mining (as a percentage of that
in December of the previous year)
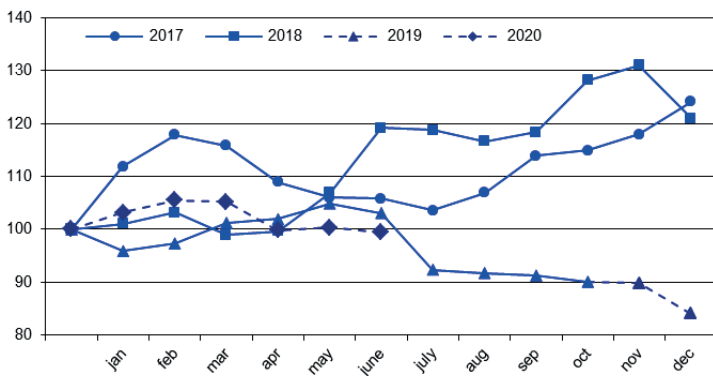
Fig. 17. The price index for manufacturing (as a percentage of that
in December of the previous year)
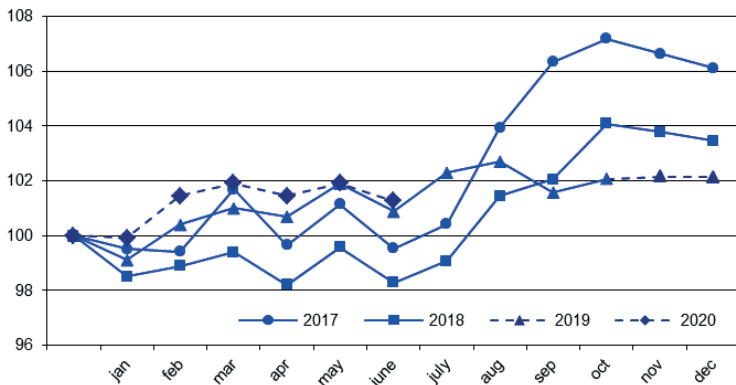
Fig. 18. The price index for utilities (electricity, water, and gas)
(as a percentage of that in December of the previous year)
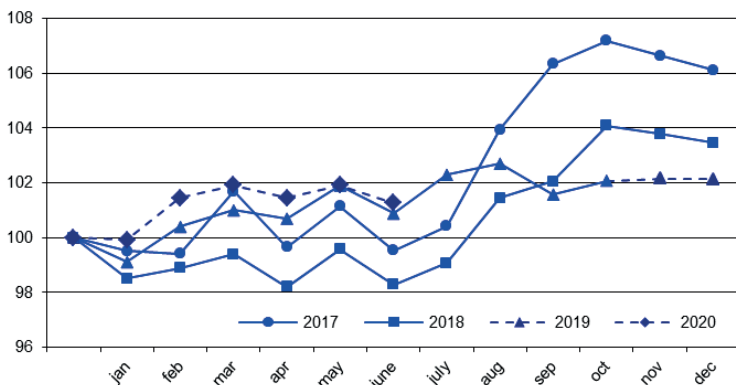
Fig. 19. The price index for food products (as a percentage of that in December of the previous year)
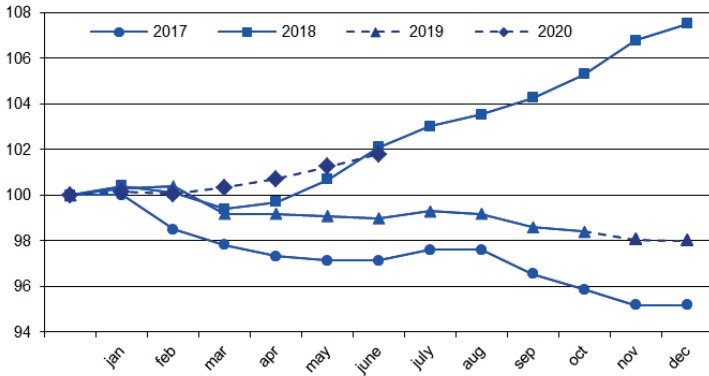
Fig. 20. The price index for the textile and sewing industry (as a percentage of that in December of the previous year)
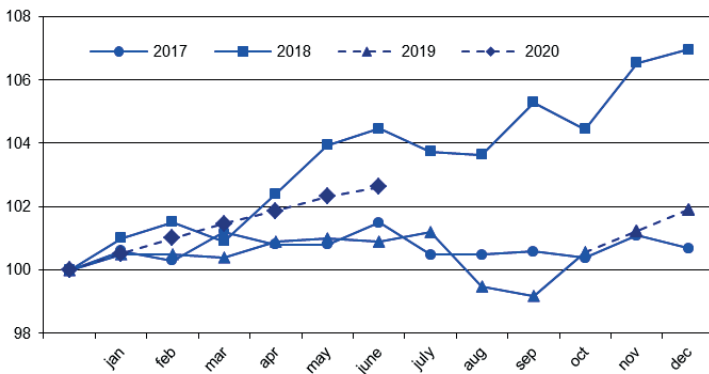
Fig. 21. The price index for wood products (as a percentage of that in December of the previous year)
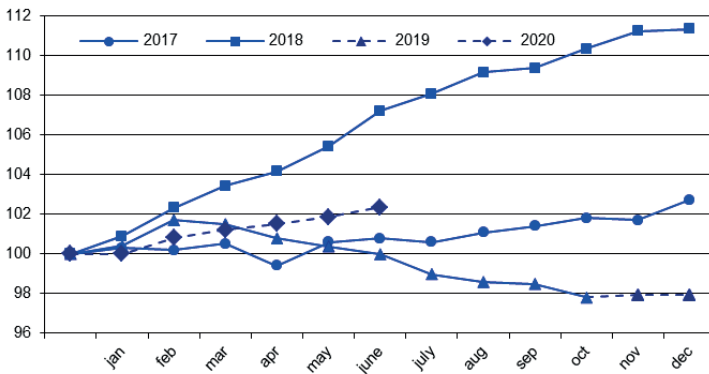
Fig. 22. The price index for the pulp and paper industry (as a percentage of that in December of the previous year)
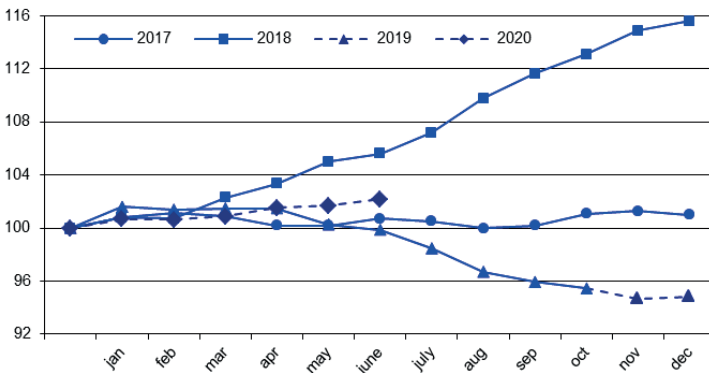
Fig. 23. The price index for coke and petroleum
(as a percentage of that in December of the previous year)
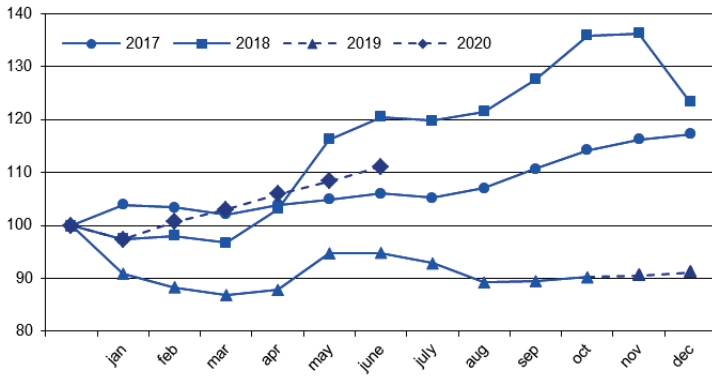
Fig. 24. The price index for the chemical industry
(as a percentage of that in December of the previous year)
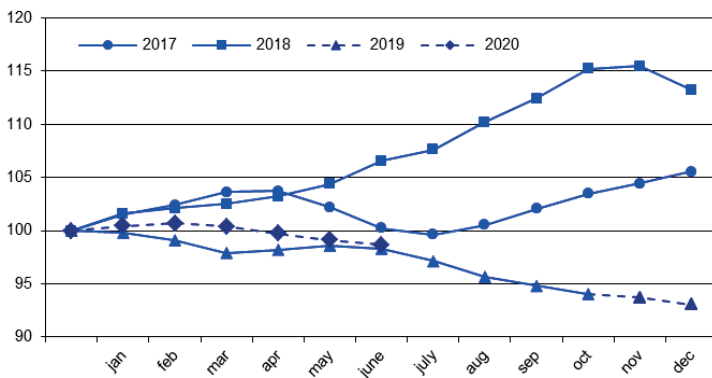
Fig. 25. The price index for primary metals and fabricated metal products
(as a percentage of that in December of the previous year)
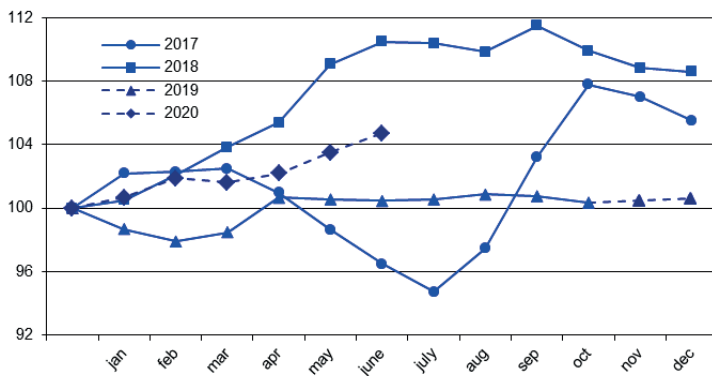
Fig. 26. The price index for machinery (as a percentage of that
in December of the previous year)
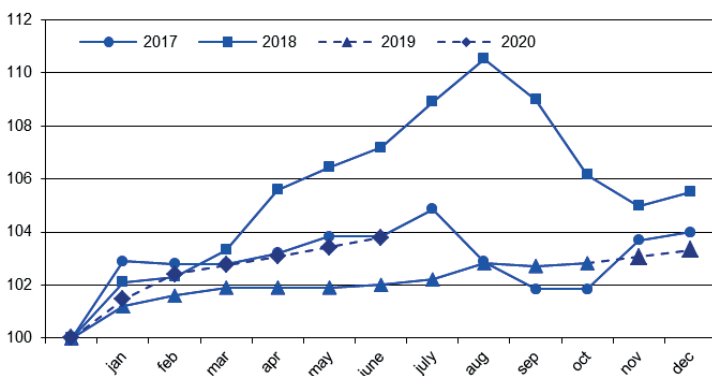
*Fig. 27. The price index for transport equipment manufacturing
(as a percentage of that in December of the previous year)*
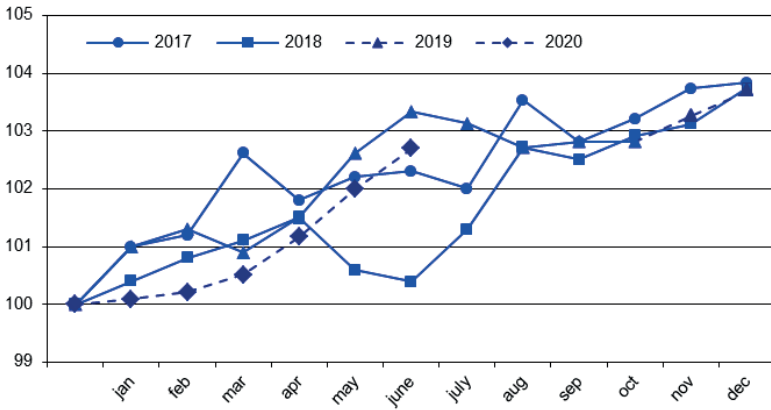
Fig. 28. The cost of the monthly per capita minimum food basket (RUB)
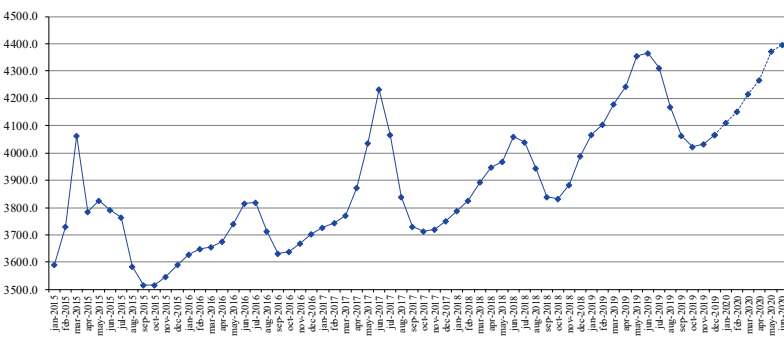
*Fig. 29. The composite index of transport tariffs
(for each year, as a percentage of that in the previous month)*
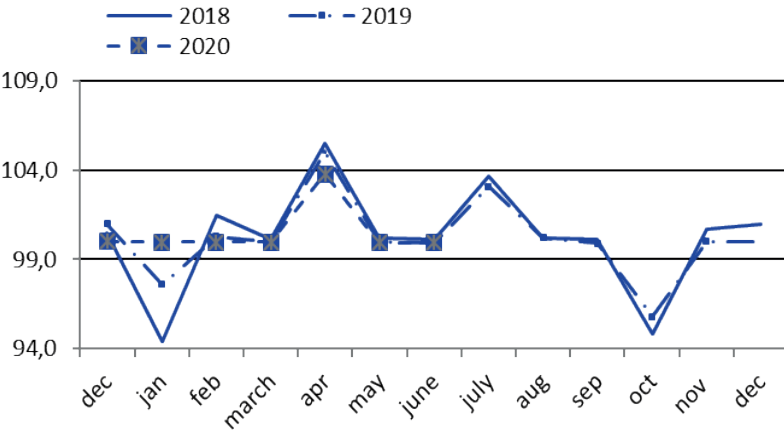
*Fig. 30. The index of motor freight tariffs
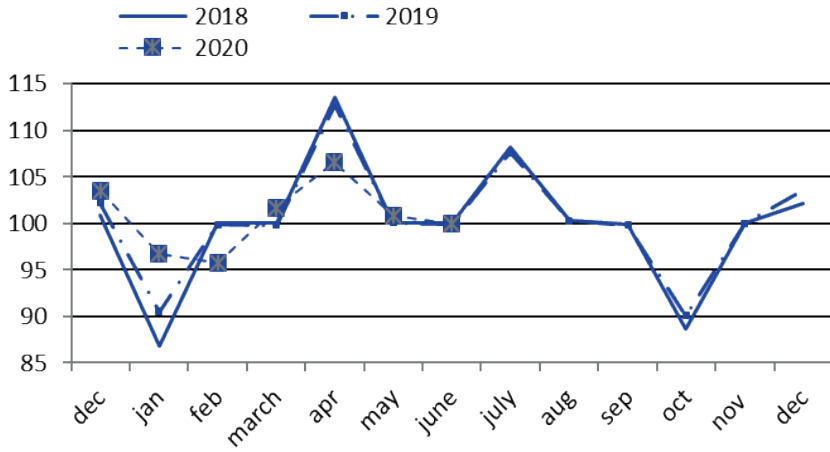(for each year, as a percentage of that in the previous month)*
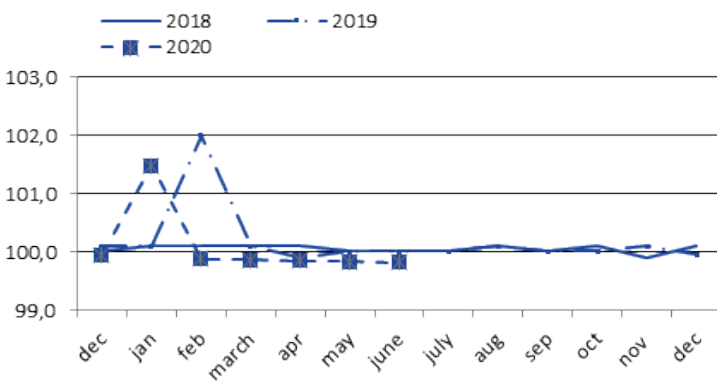
Fig. 31. The index of pipeline tariffs (for each year, as a percentage of that in the previous month)

Fig. 32. The Brent oil price ($ per barrel)
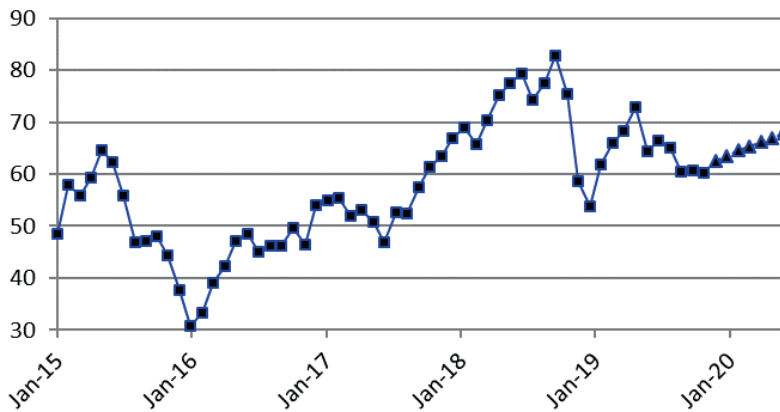
Fig. 33. The aluminum price ($ per ton)
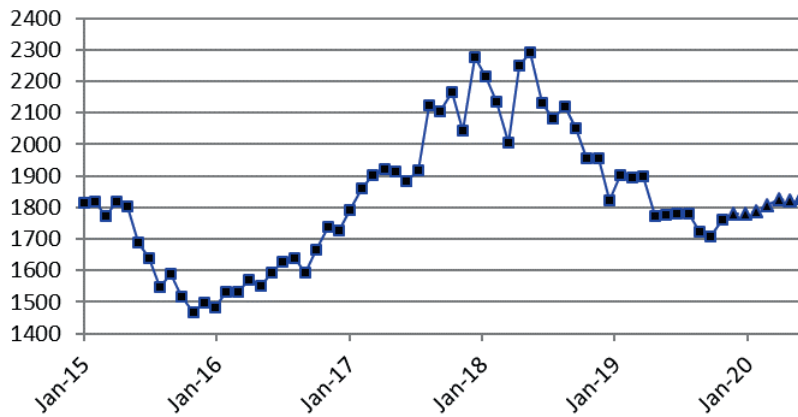
Fig. 34. The gold price ($ per ounce)
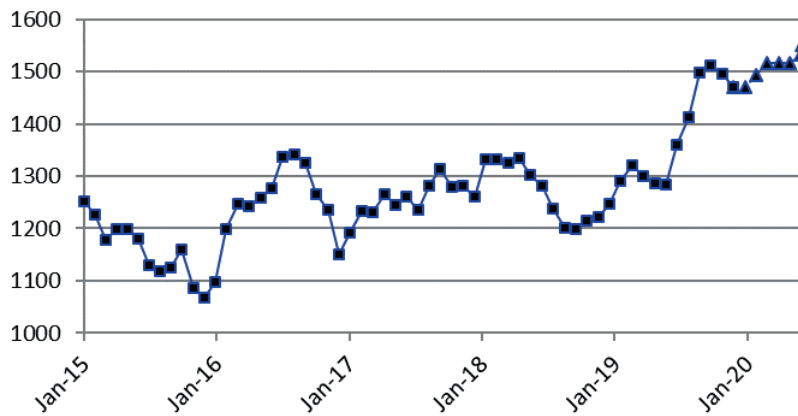
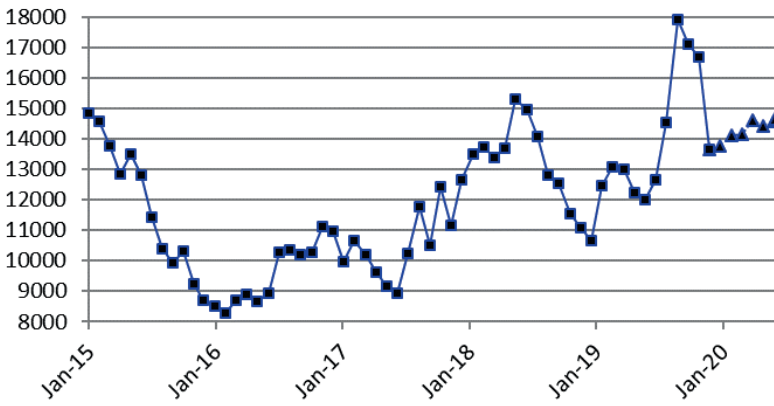*Fig. 35. The nickel price ($ per ton)*

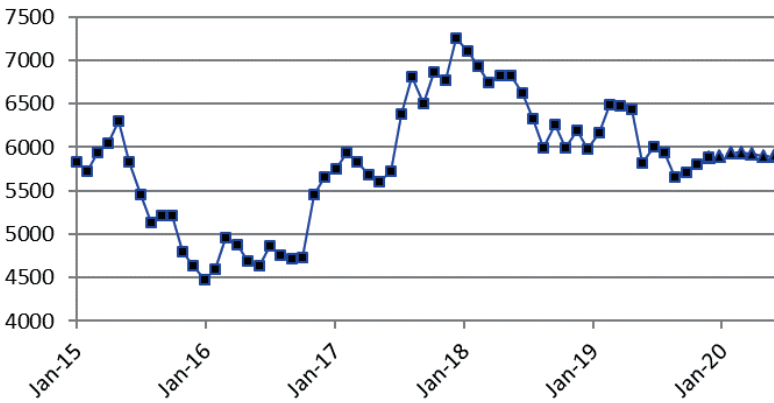*Fig. 36. The copper price ($ per ton)*
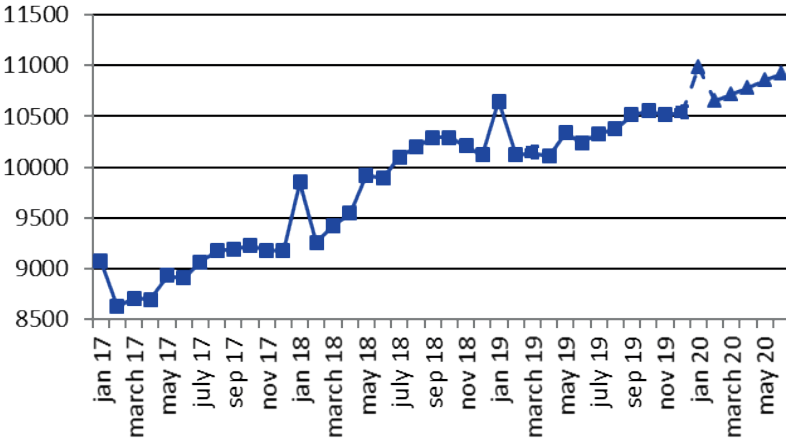

Fig. 37. The monetary base, billion RUB
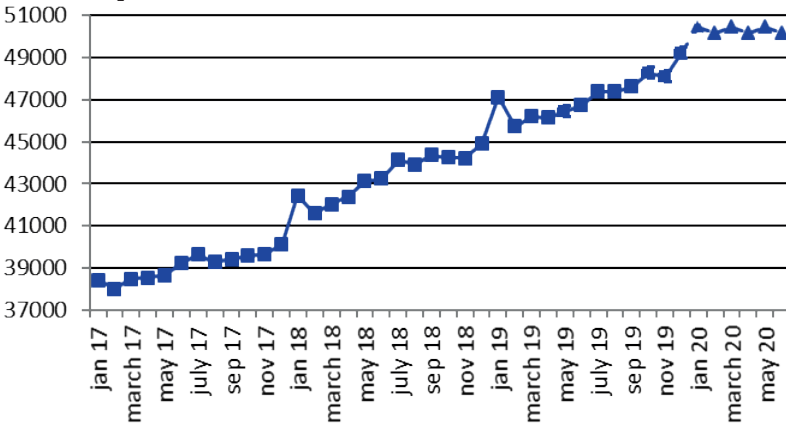

Fig. 38. M_2, billion RUB

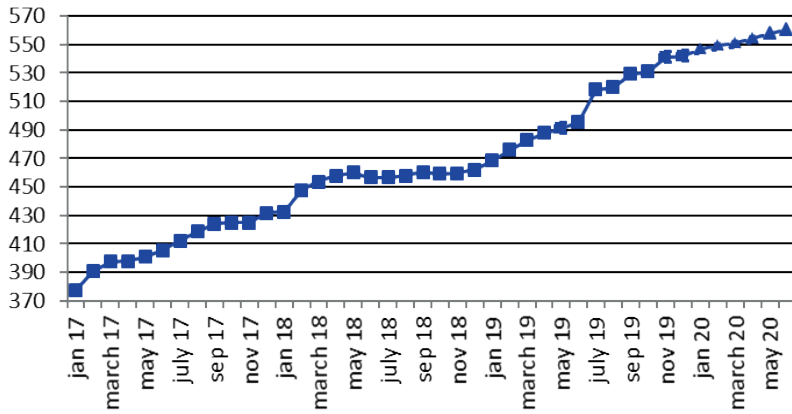*Fig. 39. The international reserves of the Russian Federation, million USD*

Fig. 40. The RUB/USD exchange rate
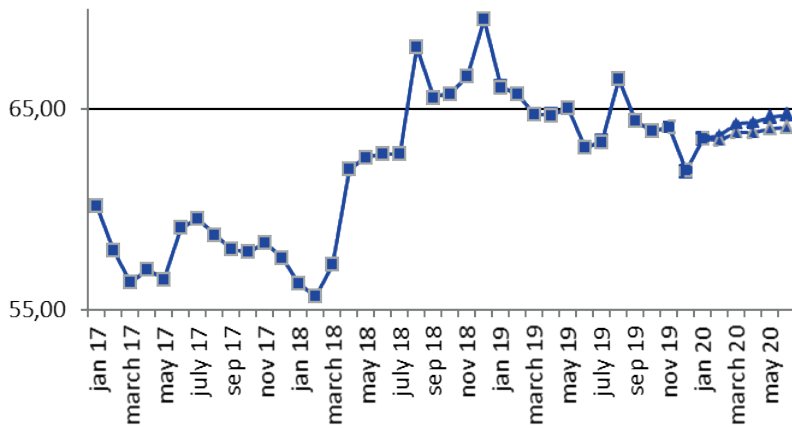
Fig. 41. The USD/EUR exchange rate
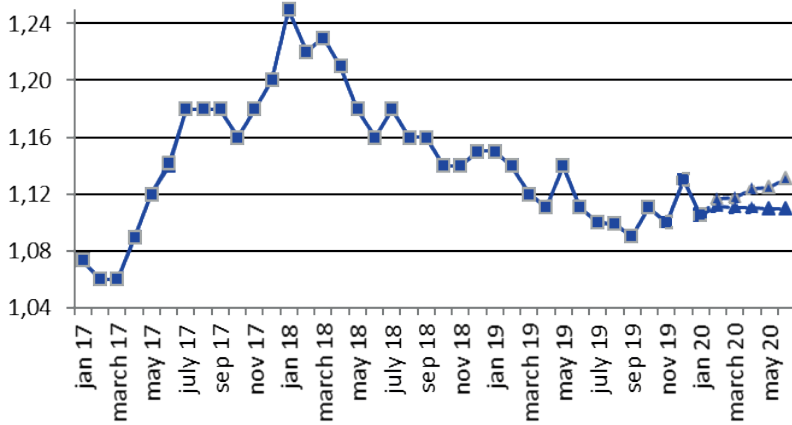
Fig. 42. Real disposable cash income (as a percentage of that in the same period of the previous year)
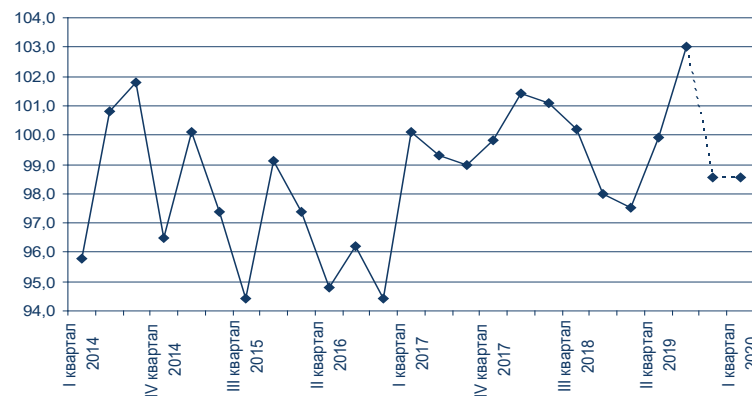
Fig. 43. Real cash income (as a percentage of that in the same period of the previous year)
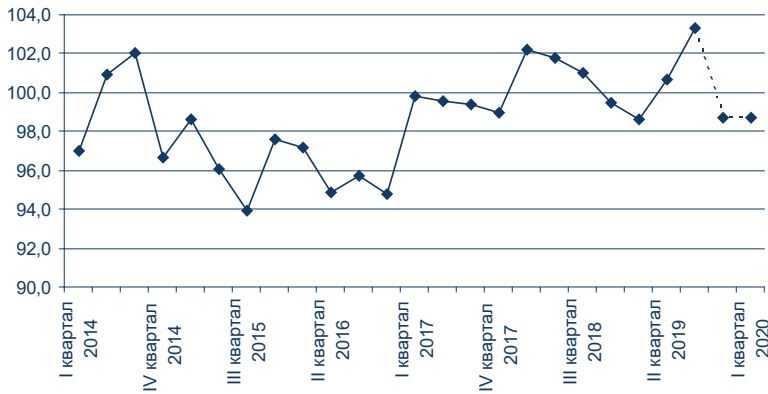

Fig. 44. Real accrued wages (as a percentage of those in the same period of the previous year)
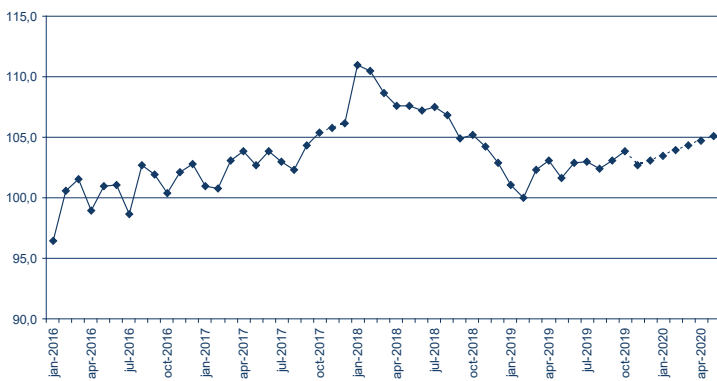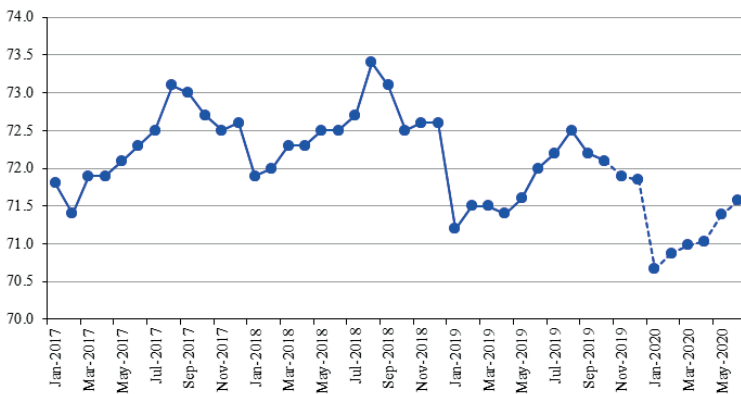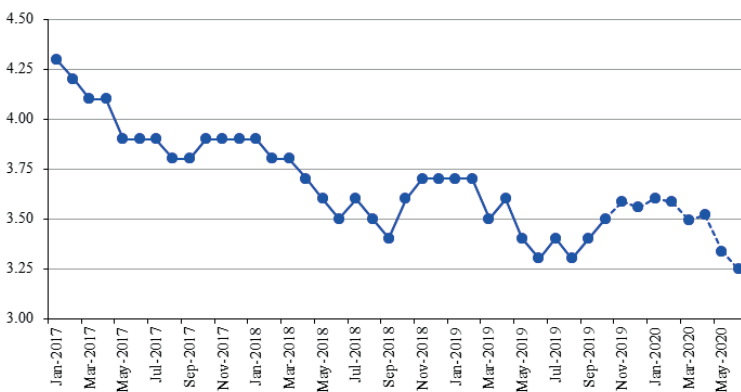

Fig. 45. Employment (million people)

Fig. 46. Unemployment (million people)

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

	2019			2020					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	jun
Rosstat IIIP (growth rate, %)*	**2.6**	2.3	2.2	2.1	1.6	2.2	1.7	1.6	2.2
HSE IIP (growth rate %)*	**3.6**	**0.0**	-0.9	1.9	1.7	2.7	2.4	0.7	1.5
Rosstat IIP for mining (growth rate, %)*	**0.9**	0.0	0.0	0.9	0.5	0.4	0.1	1.0	0.8
HSE IIP for mining (growth rate, %)*	**-0.7**	**-0.1**	-0.4	0.4	0.9	0.9	1.1	1.0	1.2
Rosstat IIIP for manufacturing (growth rate, %)*	**3.7**	2.8	3.2	3.0	1.6	2.8	1.5	3.1	1.7
HSE IIP for manufacturing (growth rate, %)*	**6.2**	**0.1**	4.1	1.4	2.4	5.2	1.9	4.5	3.4
Rosstat IIP for utilities (electricity, water, and gas) (growth rate, %)*	**2.5**	0.7	0.2	1.5	1.3	1.1	0.9	0.6	1.1
HSE for utilities (electricity, water, and gas) (growth rate, %)*	**2.5**	**-0.2**	-1.7	-0.8	0.3	1.0	0.1	1.1	1.6
Rosstat IIP for food products (growth rate, %)*	**4.5**	1.5	2.8	4.8	2.4	4.2	2.2	3.1	5.2
HSE IIP for food products (growth rate, %)*	**2.7**	**3.7**	6.0	5.5	4.4	3.2	3.2	4.2	4.5
Rosstat IIP for coke and petroleum (growth rate, %)*	**6.8**	3.8	1.0	1.5	2.4	2.4	5.1	3.6	2.5
HSE for coke and petroleum (growth rate, %)*	**4.1**	**-1.7**	-0.9	0.4	0.7	3.4	0.5	5.7	3.3
Rosstat for primary metals and fabricated metal products (growth rate, %)*	**-4.3**	0.6	7.3	2.1	-2.6	8.5	4.8	-1.8	0.0
HSE IIP for primary metals and fabricated metal products (growth rate, %)*	**-2.6**	**-1.4**	-1.5	-1.9	1.9	1.0	-2.6	-0.7	-2.4
Rosstat IIP for machinery (growth rate, %)*	**6.0**	-3.2	-1.3	-2.4	-15.3	-8.7	-2.9	-4.0	-5.9
HSE IIP for machinery (growth rate %)*	**20.0**	**2.3**	-9.8	1.7	-5.5	-5.1	-5.4	0.8	-7.6
Retail sales, trillion Rb	**2.90**	2.92	3.47	2.62	2.56	2.79	2.77	2.82	2.86
Real retail sales (growth rate, %)*	**1.7**	2.3	1.9	1.5	0.5	0.3	0.4	1.7	1.1
Export to all countries (billion $)	**36.8**	**35.4**	41.1	36.0	37.0	40.1	39.3	38.0	38.6
Export to countries outside the CIS (billion $)	**32.0**	**30.3**	36.0	31.7	34.5	35.6	35.3	35.3	35.3
Import from all countries (billion $)	**23.8**	**23.2**	23.9	19.1	20.7	22.4	22.3	22.2	21.7
Import from countries outside the CIS (billion $)	**21.5**	**20.3**	21.6	16.1	17.4	19.0	19.2	19.3	19.2
CPI (growth rate, %)**	**0.1**	0.2	0.4	0.7	0.4	0.4	0.4	0.4	0.3
PPI for industrial goods (growth rate, %)**	**-0.2**	-0.2	-0.1	0.2	0.5	0.6	0.5	0.5	0.3
PPI for mining (growth rate, %)**	**-1.3**	-0.3	-6.5	3.1	2.3	-0.2	-5.2	0.6	-0.9
PPI for manufacturing (growth rate, %)**	**0.0**	-0.1	-0.7	0.1	0.7	0.3	0.5	0.5	0.4
PPI for utilities (electricity, water, and gas) (growth rate, %)**	**0.5**	0.1	0.0	-0.1	1.5	0.5	-0.5	0.5	-0.6
PPI for food products (growth rate, %)**	**-0.2**	-0.3	-0.1	0.2	-0.1	0.3	0.4	0.6	0.5
PPI for the textile and sewing industry (growth rate, %)**	**1.4**	0.7	0.7	0.5	0.5	0.4	0.4	0.5	0.3
PPI for wood products (growth rate, %)**	**-0.7**	0.1	0.0	0.0	0.8	0.4	0.3	0.4	0.5
PPI for the pulp and paper industry (growth rate, %)**	**-0.5**	-0.8	0.1	0.7	0.0	0.2	0.6	0.2	0.5
PPI for coke and petroleum (growth rate, %)**	**0.8**	0.3	0.7	-2.7	3.4	2.3	2.9	2.3	2.5
PPI for the chemical industry (growth rate, %)**	**-0.8**	-0.4	-0.7	0.4	0.3	-0.3	-0.6	-0.6	-0.4
PPI for primary metals and fabricated metal products (growth rate, %)**	**-0.4**	0.1	0.2	0.7	1.2	-0.3	0.6	1.3	1.2
PPI for machinery (growth rate, %)**	**0.1**	0.2	0.3	1.5	0.9	0.3	0.3	0.3	0.4
PPI for transport equipment manufacturing (growth rate, %)**	**0.0**	0.4	0.4	0.1	0.1	0.3	0.7	0.8	0.7
The cost of the monthly per capita minimum food basket (thousand Rb)	**4.02**	4.03	4.07	4.11	4.15	4.21	4.27	4.37	4.40
The composite index of transportation tariffs (growth rate, %)**	**0.0**	**0.1**	0.0	1.5	-0.1	-0.1	-0.2	-0.2	-0.2
The index of pipeline tariffs (growth rate, %)**	**-9.9**	**0.0**	3.6	-3.2	-4.2	1.7	6.7	0.8	0.0
The index of motor freight tariffs (growth rate, %)**	**-4.2**	**0.0**	0.0	0.0	0.0	0.0	3.8	-0.1	-0.1
The Brent oil price ($ a barrel)	**60.2**	**62.4**	63.3	64.6	65.3	66.2	67.0	67.8	68.7
The aluminum price (thousand $ a ton)	**1.76**	**1.78**	1.78	1.79	1.81	1.83	1.82	1.83	1.84
The gold price (thousand $ per ounce)	**1.49**	**1.47**	1.47	1.49	1.52	1.52	1.52	1.53	1.55
The nickel price (thousand $ a ton)	**5.81**	**5.88**	5.90	5.94	5.94	5.92	5.90	5.90	5.91
The copper price (thousand $ a ton)	**16.7**	**13.7**	13.8	14.1	14.1	14.6	14.4	14.6	14.7

	2019			2020					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	jun
The monetary base (trillion Rb)	**10.6**	**10.5**	**10.5**	11.0	10.7	10.7	10.8	10.9	10.9
M2 (trillion Rb)	**48.3**	**48.1**	**49.2**	50.4	50.1	50.4	50.1	50.4	50.1
Gold and foreign exchange reserves (billion $)	**0.53**	**0.54**	0.54	0.55	0.55	0.55	0.55	0.56	0.56
The RUR/USD exchange rate (rubles per one USD)	**63.87**	**64.08**	**61.91**	63.52	63.58	64.06	64.09	64.29	64.42
The USD/EUR exchange rate (USD per one Euro)	**1.11**	**1.10**	**1.13**	1.11	1.12	1.12	1.12	1.12	1.12
Real accrued wages (growth rate, %)*	**3.1**	**3.8**	2.7	3.1	3.5	3.9	4.3	4.7	5.1
Employment (million people)	72.1	71.9	71.8	70.7	70.9	71.0	71.0	71.4	71.6
Unemployment (million people)	**3.5**	3.6	3.6	3.6	3.6	3.5	3.5	3.4	3.3

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