Seasonality in India's Key Economic Indicators*

The article presents the seasonal factors of 80 selected economic/financial time series comprising monetary, banking, price statistics, production data, service sector indicators, merchandise trade and alternate modes of payment. This article finds that most of the production-related variables seasonally peak around March and price-related variables record a seasonal trough around the same time. The seasonal variations in the prices of food products and primary articles have become accentuated over the last decade. As regards payment modes, instruments related to bulk transactions tend to peak during March, whereas, in the case of retail payment, seasonality peaks during festivals.

Introduction

Seasonal variations recurring weekly, monthly or quarterly constitute a behavioural component in economic series and therefore can be predictable. It is intertwined with other time series components, *viz.*, trend, cyclical variations and random fluctuations. The presence of seasonality tends to obscure the true underlying characteristics of the economic variable and its data generating process as well as the inter-relationships between variables. At the same time, correctly understanding seasonal variations helps to accurately foresee behavioural changes. In this context, identification and segregation of seasonal factors of an economic variable is a first step to appropriately use the information for the purposes of modelling and forecasting.

Measuring seasonality and undertaking seasonal adjustments has been established as the best practice while modeling time series data. The cross country

experience reveals that the USA measures GDP growth in terms of quarter-on-quarter annualised rates of change after adjusting for seasonality. The Inflation Report of the Bank of England generally uses seasonally adjusted data. The Quarterly Financial Report of Bank of Canada publishes assessment of seasonal demand for bank notes. The International Monetary Fund (2016) has advised member countries to report seasonally adjusted broad money data in their 'Standardised Report Form for Money Aggregates' in its International Financial and Monetary Statistics.

The Reserve Bank has been publishing monthly seasonal factors for important macroeconomic variables since 1980. This article carries forward this endeavor by computing and updating seasonal factors upto 2019-20. The rest of the article is organised as follows. A review of the literature relating to evolution of methodology and global usage of seasonal factors is presented in Section II. The economic variables selected for study and choice of technique for extracting seasonal factors are explained in Section III. Section IV brings out the seasonality patters for various groups of macroeconomic variables based on average monthly seasonal factors in light of data upto 2017-18. Section V presents the results on temporal shifts in seasonality patterns followed by empirical evaluation of seasonal variation. Section VI concludes the article with some policy perspective.

II. Review of the Literature

In literature, time series are assumed to be composed of orthogonal components, *viz.,* trend, seasonal, cyclical and irregular components. In an additive model, the time series is represented as the sum of the four components mentioned above, whereas in a multiplicative model the time series is the product of the components. Seasonality is the yearly or monthly predictable variation of the time series over and above trend and cycle. Seasonality plays a key role in short-term analysis of macro-economic factors and aids in effective decision-making.

The literature refers to unmasking relevant short and long-term movements of economic time series by accounting for the behavioural nature of seasonality (Manna, *et al.*, 2003; HCSO, 2017). Estimates of seasonal factors are observed to have improved the trend-based forecasts of economic variables (Lembke, 2015). Seasonal adjustment has been employed along with various smoothening and filtering techniques to extract the persistent component in economic variables, notably core inflation (Samanta, *et al.*, 2000). The use of non-parametric singular spectrum analysis for extraction of seasonality has been discussed in the context of Global Positioning System (GPS) signal extraction (Chen, *et al*, 2013) and other related fields.

The literature on estimation of seasonal factors has a long history, starting from ratio-to-moving-average method (Macaulay, 1931), further refined as Census Methods by the US Census Bureau in 1954-55. Extensive research on the explicit functional specification of seasonal and trend/cycle components led to development of various versions of seasonal adjustment methods. The X-11 method (US Census Bureau, 1965) provided functional flexibility such as multiplicative as well as additive representation of components, treatment for extreme values and various tests for seasonality (Shiskin, *et al.*, 1967). A major limitation of X-11 method, which is based on moving average or linear smoothing filter, however, was the lack of reliability of estimates for the most recent year because of inability to apply symmetric weights to end points as against central observations. This led to frequent revisions of estimates of most recent observations as more data points get added (Dagum, 1980).

Statistics Canada's X-11-ARIMA method incorporated an Autoregressive Integrated Moving Average (ARIMA) model into the X-11 method to extrapolate original time series data for one year at both ends of the series. This helped to deal with the 'end points' problem and to obtain robust estimates of seasonal factors in a scenario when seasonality is moving rapidly in a stochastic way. The US Census Bureau developed X-12-ARIMA as an enhanced version of X-11 and added a feature called RegARIMA, which has an option of built-in or user-defined regressors that enable estimation of stock trading day and holiday effects as well as disruptions in the series such as sudden changes in levels (US Census Bureau, 2011).

US Census Bureau's latest X-13 ARIMA-SEATS (Signal Extraction in ARIMA Time Series) is an enhanced version of the X-11 variant with two additional options, *viz.,* TRAMO (Time series Regression with ARIMA Noise, Missing Values and Outliers) for automatic model selection and Seasonal Extraction in ARIMA Time Series (SEATS) for conducting the seasonal adjustment procedure (Gomez, *et al.,* 1996; 2001a; 2001b; US Census Bureau, 2011).

III. Data and Methodology

In line with the best country practices and upholding standards set in the past in the Reserve Bank, the macroeconomic indicators covered here are monetary, banking, price statistics, production data, service sector indicators and merchandise trade. In recognition of the rapid proliferation of alternate modes of payment in India, *viz.,* real time gross settlements (RTGS), paper clearing, retail electronic clearing (REC) and card payment, they are also subjected to seasonality analyses. Specifically, 80 monthly macroeconomic variables disaggregated by sector include 14 monetary and banking indicators, 21 categories of indices relating to consumer prices, nine relating to wholesale prices, 23 on industrial production, six on service sector indicators, three on merchandise trade and four series on alternative payment indicators. Seasonal factors are mostly derived from time series dating back to April 1994 (Annex Table 1).

Seasonal factors have been estimated under multiplicative model by using the X13-ARIMA-SEATS software of the US Census Bureau, after configuring it to suit Indian conditions, *e.g.,* incorporating Diwali and Indian trading day effects.
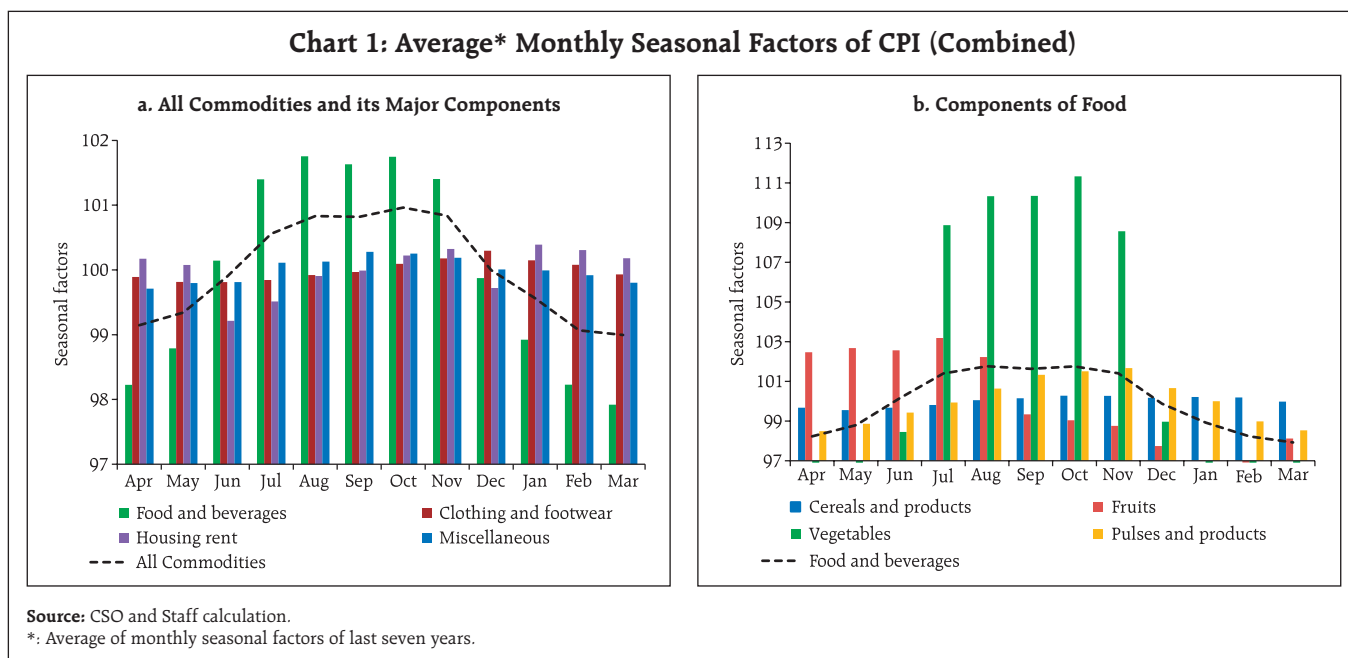
Seasonal adjustment can be done in two ways; i) direct approach - applying the seasonal adjustment procedure directly to the aggregate series; and ii) indirect approach – first seasonally adjusting each components of the composite series and then summing (aggregating) the components to get seasonally adjusted composite (Manna *et al.,* 2003). The article follows the direct approach.

IV. Analysis of Results

All the macroeconomic variables considered here exhibit different seasonality (Annex Tables 2 and 3)[1]. Of the 14 major monetary and banking indicators, 11 recorded seasonal peaks during March or April (around the financial year closure), whereas seasonal troughs for the majority of these series can be located either

in August or in December. For example, bank loans registered a seasonal peak in March, whereas banks' investments register a seasonal trough in the same month. Demand deposits of scheduled commercial banks (SCBs) exhibited the highest seasonal variation (average seasonal factor (SF) range[2] at 9.3) followed by reserve money (average SF range at 6.0) and cash in hand and balances with RBI (SCBs) (average SF range at 5.8). On the other hand, time deposits of SCBs, exhibited the smallest seasonal variation (average SF range at 1.3) indicating preference to banks' deposits as a savings avenue for fixed return and low risk (Annex Table 4).

Turning to prices, the Consumer Price Index (CPI) headline experiences seasonal upside pressure between July and November, which is largely due to the prices of food and beverages. CPI-food is driven by the seasonal patterns of prices of vegetables. Prices of fruits peak during the summer (April - August) and those of vegetables around the monsoon (July - November) due to lower availability and persistent demand (Chart 1).

Chart 1: Average* Monthly Seasonal Factors of CPI (Combined)

Source: CSO and Staff calculation.
*: Average of monthly seasonal factors of last seven years.

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[1]   In case data are available for less than ten years, average for the corresponding period is taken.

[2]   Range, a measure of dispersion, is calculated as the difference between maximum and minimum of monthly seasonal factors. Higher value of range indicates higher seasonality in the variable yielding to heightened activities/prices during a particular period of a year. 'Average seasonal factor range' is the range of average seasonal factors for the last ten years.

CPI-vegetables showed the highest seasonal variation (nine-year average SF range at 23.0). Among vegetables, prices of tomatoes, onions and potatoes recorded average SF range of 65.6, 40.4 and 35.6, respectively. Seasonal variation in fruits prices was found to be lower (average SF range of 6.3) than those of vegetables. Further, seasonal variations in the prices of cereals and products were found to be lower (average SF range at 0.7) than that of pulses and products (average SF range at 3.2), where mismatches between supply and demand were persistent, possibly caused by production uncertainty and diet shifts linked to the economic development. On the other hand, CPI - non-alcoholic beverages exhibited the smallest seasonal variation (average SF range at 0.3), which could be attributed to rising awareness about healthy lifestyle and wellness among consumers. Seasonality in the aggregate CPI series [CPI-Combined, CPI for Industrial Workers (CPI-IW), CPI for Agricultural Labourers (CPI-AL) and CPI for Rural Labourers (CPI-RL)] is low while it is pronounced in some of the components, mainly food items (Annex Table 4).

Seasonal troughs in WPI series were concentrated in only two months (March and December) relative to the distribution of seasonal peaks. Seasonal fluctuations in the WPI-all commodities were largely driven by prices of primary articles, especially food, which have a seasonal pattern similar to CPI-food and beverages. Prices of fuel and power recorded the highest seasonal variation (average SF range at 19.4) and among manufactured products group, manufacture of food products showed the lowest seasonal variation (average SF range at 2.2) (Annex Table 4).

As regards seasonality in output, industrial production is highly seasonal. The index of industrial production (IIP) showed an average SF range of 13.0. Among the major sectors, mining had the highest seasonal variation (average SF range at 30.8); under the use-based classification, capital goods had the highest seasonal fluctuation (average SF range at

35.1). Seasonal peaks in the IIP series mostly occurred in March, the last month of the financial year, which could be due to achieving annual targets; seasonal troughs, on the other hand, were scattered. A seasonal moderation in cement production was observed between July to November, which is the monsoon season in major parts of India. Fertiliser production registered a seasonal decline between February to June, which is the harvesting time of *rabi* crops and a lean season for agricultural activity.

Four of the six services sector indicators recorded seasonal peaks in March. Only in the case of domestic and international passenger traffic, the seasonal peak coincided with the holiday seasons in May and January, respectively.

The seasonal peaks for merchandise exports remained unchanged in March, coinciding with the peak in the industrial production while non-oil non-gold imports also remained unchanged in December, but the peak in imports shifted to October from March earlier (Chart 2 & Annex Table 2).

The analysis of alternate payment modes shows that RTGS, paper clearing and retail electronic clearance recorded high seasonal variations and peak

Chart 2: Seasonal Variation* of Merchandise Trade

Exports — Imports — Non-Oil Non-Gold Imports

* Difference between SF in peak month and SF in trough month during a year.

Chart 3: Seasonal Variation in Alternate Modes of Payment and Currency in Circulation

a. Seasonal Variation in Alternate Payment Modes

b. Seasonal Peak and Trough

Source: : RBI and Staff calculation.
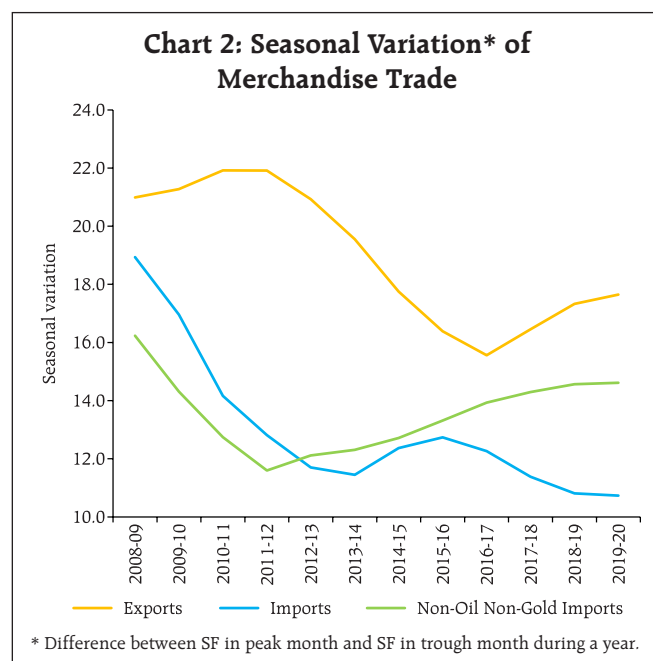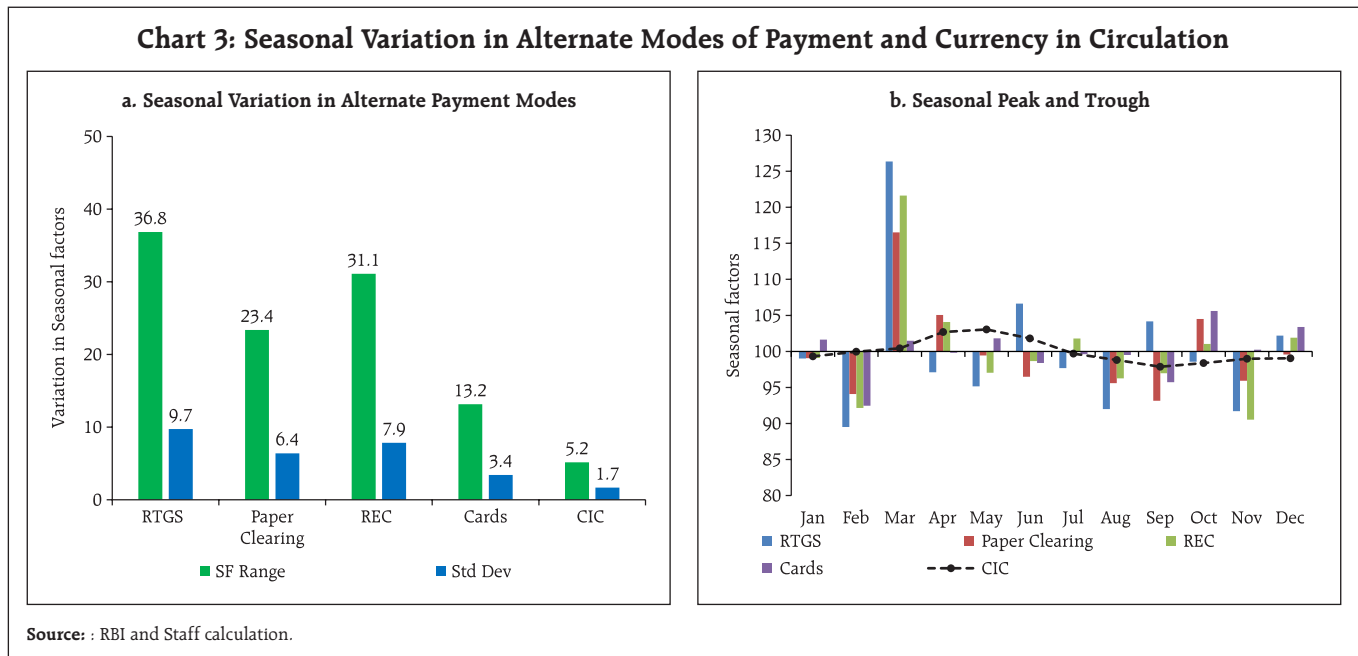
during March, indicating heightened usage of online transfers on annual financial year closing, whereas the seasonal peak of usage of card payments mode was found to be during October, consumption – demand around the festival season. The seasonal troughs, on the other hand, were found to be distributed over February, September and November (Chart 3 and Annex table 2).

V. Has Seasonality Changed?

A simple way of identifying change in seasonality patterns in 2019-20 would be to compare the outcomes for 2019-20 with the average seasonal factors for the last five years (2014-15 to 2018-19). Out of the 80 selected series, the peak and the trough for 41 series remained unchanged whereas four series recorded shifts in both peaks and troughs (Chart 4 and Annex

Chart 4: Instance of Shifting Seasonal Peak and Trough Months

Source: RBI staff calculation.
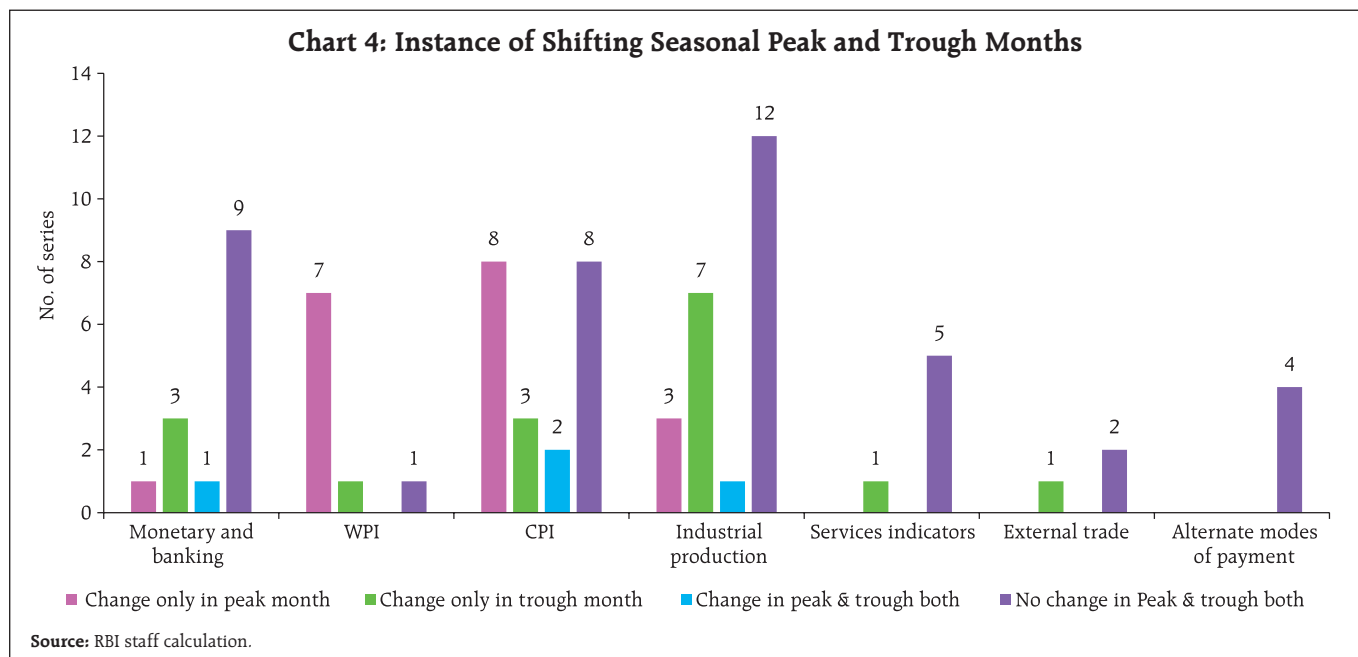
table 5). This change in seasonality was noticed mainly in the case of CPI. The seasonal peak in CPI-all commodities advanced to November in 2019-20 from October earlier, mainly reflecting change in the prices of vegetables. Seasonal peaks in the prices of CPI-food and beverages also shifted to November from August earlier which got aligned with the seasonal peak in the prices of food articles in the wholesale market. Further, greater convergence in the seasonal peaks of the components of industrial production was found in 2019-20.

In order to explore 'moving seasonality'- changes in seasonal factors over time - detecting the presence of secular trend is critical. A downward (upward) trend in the seasonal fluctuation of a series shows decline (increase) in seasonal variation over time.

While in majority of the cases, seasonal variation/ fluctuations (difference between the maximum and the minimum monthly seasonal factors) in 2019-20 remained similar to the previous five years' average (Chart 5), empirical evidence indicates that seasonal fluctuations moderated for 35 series over a longer time horizon of last 10 years (Annex table 6). On the other hand, seasonality became more pronounced in another 22 series.

Seasonal fluctuations in monetary and banking aggregates either moderated or remained broadly unchanged during last 10 years, arguably reflecting better availability of banking services. Though seasonal fluctuation in general IIP remained unchanged, mining, manufacturing and electricity recorded rise in seasonal variation. The mining activity, especially coal, is adversely affected due to rain and slowdown in railway transport during the monsoon season. Hence, supposedly the higher production during active season to meet rising demand for coal and other minerals explains the rise in seasonal fluctuation over time. Seasonal variation moderated for the majority of CPI-combined elements; retail prices of tomatoes, meat and fish exhibited higher seasonality while potato and onion prices showed lower seasonality. In the wholesale market, WPI-all commodities showed more

Chart 5: Comparative Analysis of Seasonal Variation

Source: RBI staff calculation.
Note: The above scatter plot presents a comparative position of seasonal variation in 80 macroeconomic indicators selected for study.

Chart 6: Pattern of Changing Seasonal Fluctuation

■ Increasing Momentum   ■ Decreasing Momentum   ■ Remained Same

Source: RBI staff calculation.
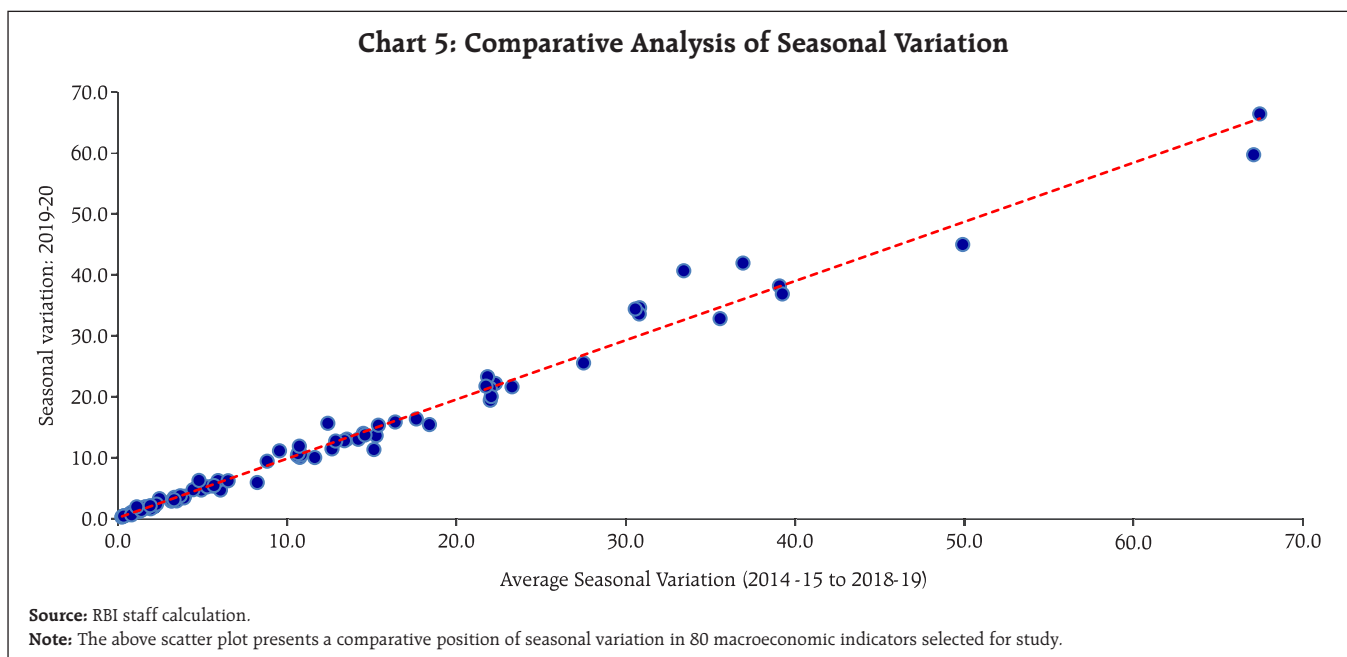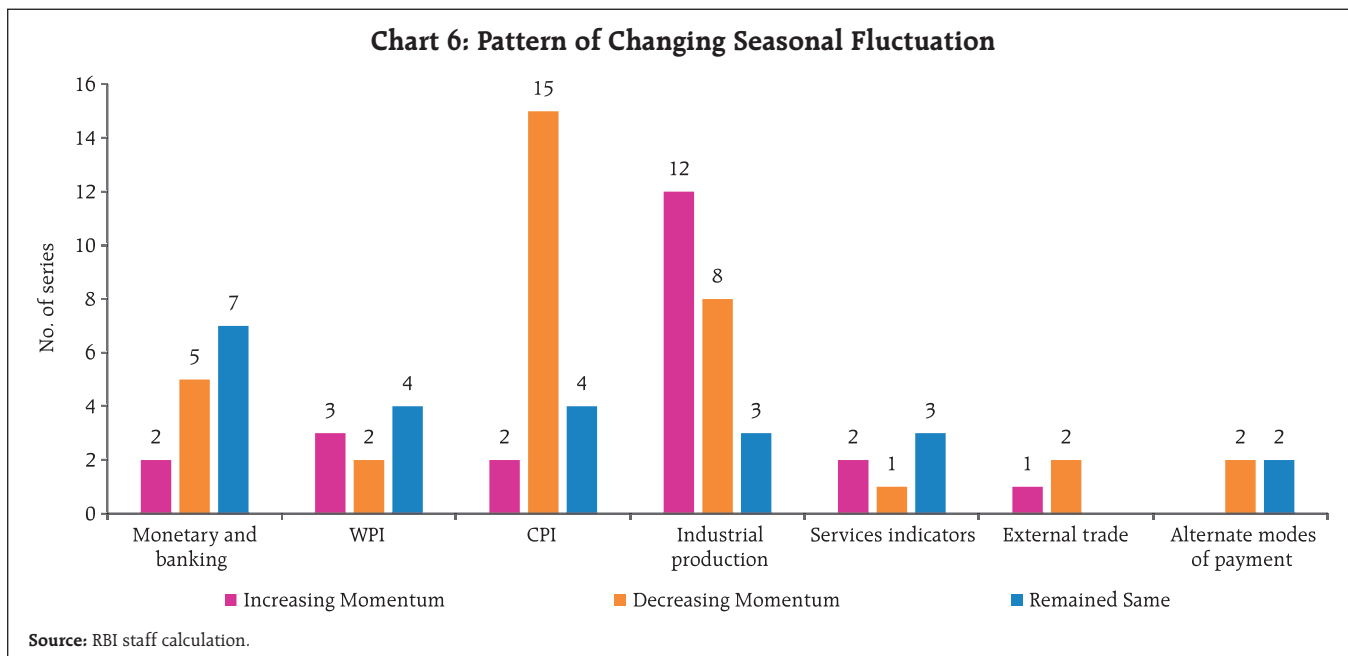
seasonal variation mainly due to prices of chemicals and chemical products (Chart 6).

VI. Conclusion

Seasonal adjustment has a crucial role to play in an accurate reading of the economy and in making policy decisions. It is observed that the heightened seasonal demand for currency in circulation around financial year-end and beginning of agricultural season, *viz.*, March and June gives a cue for efficient currency management in the country, similarly, the knowledge of seasonal pattern in banks' deposits can be used in managing the banks' resources optimally.

Driven by the prices of vegetables, CPI headline inflation exhibited price pressures during the monsoon season. The seasonal peak for general retail prices got advanced to November in 2019-20 from October, aligning with the wholesale market. This calls for efficient supply chain management during such periods.

Majority of categories of industrial production peak in March whereas the production of consumer non-durables peak in December. The seasonal peak

in the manufacture of textiles had advanced to December, the winter season in the country, from August earlier. Imports and exports experience a peak during March. Further, bank credit peaks in March, apparently to cater to the year-end pressure of target achievements. Well strategizing credit availability by banks and credit institutions, keeping in mind the demand around festivals, will provide stimulus to the productive activities.

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Annex

Table 1: Time Period Used for Estimating Seasonal Factors

Name of Sectors/Variables	Time Period	Name of Sectors/Variables	Time Period
Monetary and Banking Indicators (14 series)		**Index of Industrial Production (23 series)**	
A.1.1 Broad Money (M3)	April 1994 to March 2020	E. IIP (Base 2011-12 = 100) General Index	April 1994 to March 2020
A.1.1.1 Net Bank Credit to Government			
A.1.1.2 Bank Credit to Commercial Sector			
A.1.2 Narrow Money (M1)		E.1.1 IIP - Primary goods	April 2012 to March 2020
A.1.3 Reserve Money (RM)		E.1.2 IIP - Capital goods	
A.1.3.1 Currency in Circulation		E.1.3 IIP - Intermediate goods	
A.2.1 Aggregate Deposits (SCBs)		E.1.4 IIP - Infrastructure/ construction goods	
A.2.1.1 Demand Deposits (SCBs)		E.1.5 IIP - Consumer goods	
A.2.1.2 Time Deposits (SCBs)		E.1.5.1 IIP - Consumer durables	
A.3.1 Cash in Hand and Balances with RBI (SCBs)		E.1.5.2 IIP - Consumer non-durables	
A.3.2 Bank Credit (SCBs)		E.2.1 IIP - Mining	April 1994 to March 2020
A.3.2.1 Loans, Cash Credits and Overdrafts (SCBs)		E.2.2 IIP - Manufacturing	
A.3.2.2 Non-Food Credit (SCBs)		E.2.2.1 IIP - Manufacture of food products	April 2012 to March 2020
A.3.3 Investments (SCBs)		E.2.2.2 IIP - Manufacture of beverages	
Price Indices[CPI: 21 series and WPI: 9 series]		E.2.2.3 IIP - Manufacture of textiles	
B. CPI (Base: 2012 = 100) All Commodities	January 2011 to March 2020	E.2.2.4 IIP - Manufacture of chemicals and chemical products	
B.1 CPI - Food and beverages		E.2.2.5 IIP - Manufacture of motor vehicles, trailers and semi-trailers	
B.1 .1 CPI - Cereals and products		E.2.3 IIP - Electricity	April 1994 to March 2020
B.1 .2 CPI - Meat and fish			
B.1 .3 CPI – Egg			
B.1 .4 CPI - Milk and products		E.3 Cement Production	April 2004 to March 2020
B.1 .5 CPI – Fruits		E.4 Steel Production	
B.1 .6 CPI - Vegetables		E.5 Coal Production	
B.1 .6.1 CPI – Potato		E.6 Crude Oil Production	
B.1 .6.2 CPI – Onion		E.7 Petroleum Refinery Production	
B.1 .6.3 CPI – Tomato		E.8 Fertiliser Production	
B.1 .7 CPI - Pulses and products		E.9 Natural Gas Production	
B.1 .8 CPI – Spices		**Service sector Indicators (6 series)**	
B.1 .9 CPI - Non-alcoholic beverages		F.1 Production of Commercial Motor Vehicles	April 1994 to March 2020
B.1 .10 CPI - Prepared meals, snacks, sweets etc.		F.2 Cargo handled at Major Ports	
B.2 CPI - Clothing and footwear		F.3 Railway Freight Traffic	
B.3 CPI – Housing		F.4 Sales of Commercial Motor Vehicles	
B.4 CPI - Miscellaneous		F.5 Passenger flown (Km) - Domestic	
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	January 2000 to March 2020	F.6 Passenger flown (Km) - International	
		Merchandise Trade (3 series)	
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)		G.1 Exports	April 1994 to March 2020
		G.2 Imports	
C.3 Consumer Price Index for Rural Labourers (Base: 1986-87=100)		G.3 Non-Oil Non-Gold Imports	
D. WPI (Base: 2011-12=100) All Commodities	April 1994 to March 2020	**Alternate Modes of Payment (4 Series)**	
D.1 WPI - Primary Articles		H.1 Real Time Gross Settlement	April 2004 to March 2020
D.1.1 WPI - Food Articles			
D.2 WPI - FUEL & POWER		H.2 Paper Clearing	April 2005 to March 2020
D.3 WPI - MANUFACTURED PRODUCTS			
D.3.1 WPI - Manufacture of Food Products			
D.3.2 WPI - Manufacture of Chemicals & Chemical Products		H.3 Retail Electronic Clearing	April 2004 to March 2020
D.3.3 WPI - Manufacture of Basic Metals Alloys & Metals Products		H.4 Cards	
D.3.4 WPI - Manufacture of Machinery & Machine Tools			

Note:

1. CPI-Combined data is available from January 2011 only.
2. CPI-IW, AL & RL data are broadly aligned with the latest base year of CPI-IW.
3. Data on IIP use-based and disaggregated sectors (NIC-2 digit level) was considered since Apr 2012 as back series could not be computed due to major changes in coverage from previous base year.
4. All the data being used for this study are publically available in the Database on India Economy, Reserve Bank of India.

Table 2: No. of Peaks and Trough Observed Over Different Months*

Sectors/sub-sectors		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Monetary and Banking	Peak	4	1		1	1							7	14
	Trough					4	1	2		4	2		1	14
CPI	Peak			1	2	1	2	3	8	2	2			21
	Trough	7	4	2					1			3	4	21
WPI	Peak	2	2		2	1	1	1						9
	Trough									4	1	1	3	9
Industrial Production	Peak		2		1	1		3		2			14	23
	Trough	6		1		3	5		2	1		5		23
Services Indicators	Peak		1								1		4	6
	Trough	1		1			4							6
External Trade	Peak							1		1			1	3
	Trough								1			2		3
Alternate Modes of Payment	Peak							1					3	4
	Trough						1		1			2		4
Total	Peak	6	6	1	6	4	3	9	8	5	3	0	29	80
	Trough	14	4	4	0	7	11	2	5	9	3	13	8	80

*Note:
1. In general, seasonal peaks and troughs have been decided based on the average seasonal factors of last ten years.
2. Blank cells indicate no peak or trough observed.

Table 3: Average* Monthly Seasonal Factors of Selected Economic Time Series *(Contd.)*

Series/Month	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	2	3	4	5	6	7	8	9	10	11	12	13
Monetary and Banking Indicators(14 series)												
A.1.1 Broad Money (M3)	**101.2**	100.8	100.0	100.1	99.8	99.6	99.9	99.6	**99.2**	99.5	99.6	100.7
A.1.1.1 Net Bank Credit to Government	101.2	101.1	100.8	**101.8**	101.2	99.7	99.8	99.7	**97.9**	99.1	99.1	98.7
A.1.1.2 Bank Credit to Commercial Sector	100.9	100.3	100.2	99.5	**99.1**	99.3	99.4	99.2	99.7	100.0	100.4	**102.2**
A.1.2 Narrow Money (M1)	102.0	101.4	100.6	99.2	98.8	99.1	99.0	98.7	98.8	**98.7**	99.9	**103.7**
A.1.3 Reserve Money (RM)	102.0	101.7	101.1	99.7	98.9	98.4	**98.2**	98.9	98.8	99.0	99.2	**104.1**
A.1.3.1 Currency in Circulation	102.7	**103.0**	101.8	99.7	98.8	**97.9**	98.4	99.0	99.0	99.3	100.0	100.4
A.2.1 Aggregate Deposits (SCBs)	**100.9**	100.4	99.8	100.2	99.9	99.8	100.1	99.8	**99.4**	99.5	99.5	100.8
A.2.1.1 Demand Deposits (SCBs)	101.1	99.4	99.6	98.4	98.3	101.0	**98.0**	98.9	100.7	98.2	98.9	**107.3**
A.2.1.2 Time Deposits (SCBs)	**100.7**	100.5	99.8	100.3	100.0	99.6	100.4	100.0	**99.4**	99.7	99.6	100.0
A.3.1 Cash in Hand and Balances with RBI (SCBs)	**101.8**	99.7	101.7	99.9	100.5	101.1	98.7	101.4	101.2	**96.1**	99.0	99.7
A.3.2 Bank Credit (SCBs)	101.0	100.3	100.3	99.5	**99.0**	99.3	99.2	99.1	99.9	99.9	100.3	**102.3**
A.3.2.1 Loans, Cash, Credits and Overdrafts (SCBs)	100.6	100.2	100.4	99.1	**98.9**	100.2	99.4	99.2	100.0	99.9	100.1	**102.0**
A.3.2.2 Non-Food Credit (SCBs)	101.0	100.2	100.2	99.3	**99.0**	99.5	99.4	99.1	99.8	99.8	100.1	**102.5**
A.3.3 Investments (SCBs)	100.1	100.4	100.2	101.0	**101.6**	101.0	100.8	100.5	99.0	99.1	99.1	**97.6**
Price Indices [CPI: 21 series and WPI: 9 series]												
B. CPI (Base: 2012 = 100) All Commodities	99.1	99.3	99.9	100.6	100.8	100.8	**101.0**	100.8	100.0	99.6	99.1	**99.0**
B.1 CPI - Food and beverages	98.2	98.8	100.1	101.4	**101.8**	101.6	101.7	101.4	99.9	98.9	98.2	**97.9**
B.1 .1 CPI - Cereals and products	99.7	**99.6**	99.7	99.8	100.0	100.1	**100.3**	100.3	100.2	100.2	100.2	100.0
B.1 .2 CPI - Meat and fish	99.7	100.5	**101.9**	101.9	100.8	100.0	99.4	**98.8**	98.8	99.6	99.3	99.4
B.1 .3 CPI - Egg	97.0	**96.9**	98.4	100.2	99.3	98.9	99.1	101.2	103.0	**103.8**	102.1	100.0
B.1 .4 CPI - Milk and products	**99.6**	99.9	100.0	100.2	100.2	100.2	100.1	**100.2**	100.1	99.9	99.9	99.7
B.1 .5 CPI - Fruits	102.5	102.7	102.6	**103.2**	102.2	99.3	99.0	98.8	97.7	97.0	**96.9**	98.1
B.1 .6 CPI - Vegetables	89.4	92.8	98.4	108.9	110.3	110.3	**111.3**	108.6	99.0	93.3	89.7	**88.3**
B.1 .6.1 CPI - Potato	86.9	96.1	103.2	109.5	113.0	112.3	114.3	**115.3**	102.3	86.7	**79.6**	80.6
B.1 .6.2 CPI - Onion	80.7	**79.8**	85.7	98.1	109.6	115.1	118.7	**120.1**	110.4	102.6	94.4	84.7
B.1 .6.3 CPI - Tomato	80.7	92.1	110.6	**138.4**	122.6	108.7	108.8	115.8	92.1	81.4	**72.8**	75.7
B.1 .7 CPI - Pulses and products	**98.5**	98.9	99.4	99.9	100.6	101.3	101.5	**101.7**	100.7	100.0	99.0	98.5
B.1 .8 CPI - Spices	**99.3**	99.4	99.6	99.9	100.2	100.3	100.4	100.4	**100.5**	100.3	99.9	99.6
B.1 .9 CPI - Non-alcoholic beverages	99.9	100.0	100.0	100.1	100.1	**100.1**	100.1	100.1	100.0	100.0	99.9	**99.8**
B.1 .10 CPI - Prepared meals, snacks, sweets etc.	99.8	**99.7**	99.8	99.9	100.0	100.1	100.1	**100.3**	100.2	100.1	100.1	99.9
B.2 CPI - Clothing and footwear	99.9	99.8	**99.8**	99.8	99.9	100.0	100.1	100.2	**100.3**	100.1	100.1	99.9
B.3 CPI - Housing	100.2	100.1	**99.2**	99.5	99.9	100.0	100.2	100.3	99.7	**100.4**	100.3	100.2
B.4 CPI - Miscellaneous	**99.7**	99.8	99.8	100.1	100.1	**100.3**	100.3	100.2	100.0	100.0	99.9	99.8
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	**98.8**	99.2	99.4	99.8	101.0	100.9	100.7	**101.1**	100.8	99.8	99.5	99.0
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)	**98.9**	99.1	99.5	100.1	100.6	100.8	100.8	**101.0**	100.6	100.1	99.6	99.0
C.3 Consumer Price Index for Rural Labourers (Base: 1986-87=100)	**98.9**	99.2	99.5	100.1	100.4	100.8	100.8	**100.9**	100.5	100.1	99.6	99.1
D. WPI (Base: 2011-12=100) All Commodities	99.6	99.7	100.1	100.2	100.2	100.2	**100.3**	100.1	99.9	100.0	99.9	**99.6**
D.1 WPI - PRIMARY ARTICLES	99.8	100.1	100.0	100.6	100.5	**100.6**	100.5	100.3	99.5	99.5	**99.3**	99.3
D.1.1 WPI - Food Articles	99.1	99.5	100.4	101.5	**102.0**	101.4	101.2	101.3	99.3	98.6	98.0	**97.6**
D.2 WPI - FUEL & POWER	95.2	96.8	101.7	106.0	107.5	107.3	108.1	**108.1**	97.2	94.2	**88.7**	88.9
D.3 WPI - MANUFACTURED PRODUCTS	98.4	99.1	100.4	101.7	101.9	101.8	**102.3**	102.1	99.3	98.7	97.2	**97.0**
D.3.1 WPI - Manufacture of Food Products	**98.9**	99.0	99.3	100.0	100.5	100.6	101.0	**101.0**	100.6	100.3	99.8	99.1
D.3.2 WPI - Manufacture of Chemicals & Chemical Products	99.0	99.4	99.7	100.7	101.0	101.0	**101.2**	100.6	99.7	99.4	99.4	**98.9**
D.3.3 WPI - Manufacture of Basic Metals Alloys & Metals Products	98.9	98.0	**97.7**	98.5	99.4	99.4	99.6	101.0	101.6	**102.6**	102.3	101.0
D.3.4 WPI - Manufacture of Machinery & Machine Tools	97.6	98.7	99.0	100.5	101.4	101.4	**103.3**	102.7	101.4	99.5	97.7	**97.0**

Table 3: Average* Monthly Seasonal Factors of Selected Economic Time Series *(Concld.)*

Series/Month	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	2	3	4	5	6	7	8	9	10	11	12	13
Index of Industrial Production (23 series)												
E. IIP (Base 2011-12 =A51:A72 100) General Index	**96.6**	100.1	98.6	98.0	96.8	97.9	99.5	97.8	103.2	103.2	98.7	**109.6**
E.1.1 IIP - Primary goods	97.2	102.4	99.4	97.7	97.3	**94.9**	100.4	98.3	103.5	104.2	96.0	**108.8**
E.1.2 IIP - Capital goods	**89.2**	97.1	98.7	94.8	96.7	102.1	96.4	97.8	101.8	98.1	102.6	**124.3**
E.1.3 IIP - Intermediate goods	98.0	100.1	98.5	100.4	100.0	99.9	99.0	97.7	101.1	100.9	**97.4**	**107.5**
E.1.4 IIP - Infrastructure/ construction goods	99.5	104.3	101.5	99.9	97.3	96.0	97.7	**94.4**	100.4	103.6	99.1	**107.0**
E.1.5 IIP - Consumer goods	**95.4**	98.6	96.4	97.7	97.1	100.4	101.7	99.3	103.9	103.1	100.1	**106.2**
E.1.5.1 IIP - Consumer durables	**95.8**	99.2	97.2	98.8	97.9	105.5	**107.8**	99.3	97.6	98.9	96.5	104.6
E.1.5.2 IIP - Consumer non-durables	**94.9**	99.5	95.3	95.8	95.9	96.1	96.1	100.8	108.1	106.3	102.8	**108.7**
E.2.1 IIP - Mining	97.9	100.6	96.1	91.2	89.6	**88.6**	97.6	100.5	107.2	109.0	103.0	**119.4**
E.2.2 IIP - Manufacturing	**96.0**	99.7	98.4	98.7	97.4	99.0	99.7	97.9	103.1	102.6	98.8	**108.5**
E.2.2.1 IIP - Manufacture of food products	94.2	88.2	**85.8**	90.3	88.4	89.0	94.6	104.2	**122.5**	119.9	112.8	110.0
E.2.2.2 IIP - Manufacture of beverages	119.8	**130.2**	108.0	88.9	**85.8**	89.8	91.0	85.9	90.0	95.1	98.8	118.1
E.2.2.3 IIP - Manufacture of textiles	97.8	99.0	98.0	100.9	102.4	101.1	101.3	99.3	101.6	100.9	**96.1**	101.7
E.2.2.4 IIP - Manufacture of chemicals and chemical products	94.7	100.5	99.5	103.8	101.6	101.0	100.5	98.5	101.1	100.8	**93.8**	**104.7**
E.2.2.5 IIP - Manufacture of motor vehicles, trailers and semi-trailers	99.0	100.5	97.4	100.2	99.4	101.1	100.4	100.8	**93.0**	99.8	100.2	**108.3**
E.2.3 IIP - Electricity	100.1	**105.2**	100.5	102.6	102.3	99.6	102.5	94.7	97.7	99.0	**92.2**	102.5
E.3 Cement Production	103.9	103.4	100.5	96.8	**90.5**	91.8	98.6	92.5	102.0	105.9	100.9	**112.9**
E.4 Steel Production	98.5	104.2	99.3	100.1	98.8	96.6	98.9	**95.7**	100.4	103.7	98.1	**105.7**
E.5 Coal Production	91.8	94.1	89.7	83.0	**81.4**	81.4	95.3	103.0	113.3	117.0	112.1	**138.2**
E.6 Crude Oil Production	98.9	101.8	99.3	101.7	101.4	97.9	101.9	99.0	102.0	101.3	**92.2**	**102.7**
E.7 Petroleum Refinery Production	95.8	100.9	99.3	101.3	100.5	95.5	102.2	98.6	103.2	102.8	**95.2**	**104.6**
E.8 Fertiliser Production	**82.2**	95.2	99.4	104.2	106.1	104.5	**107.3**	104.1	105.5	102.9	93.7	95.3
E.9 Natural Gas Production	97.4	101.4	98.6	101.9	101.5	98.6	102.4	99.8	**102.6**	101.9	**91.8**	102.1
Service Sector Indicators (6 series)												
F.1 Production of Commercial Motor Vehicles	95.6	96.5	**92.1**	95.9	96.8	98.3	101.5	99.8	92.7	106.7	107.2	**116.7**
F.2 Cargo handled at Major Ports	100.0	103.9	97.3	99.5	98.3	**93.1**	98.5	98.7	102.5	104.5	94.8	**108.5**
F.3 Railway Freight Traffic	97.3	100.9	97.1	98.1	95.2	**93.5**	98.4	98.4	103.5	106.5	97.7	**113.2**
F.4 Sales of Commercial Motor Vehicles	**86.6**	91.1	96.3	93.6	95.4	106.7	99.4	94.4	97.9	104.5	104.6	**129.9**
F.5 Passenger flown (Km) - Domestic	100.7	**110.7**	102.4	96.9	94.7	**90.6**	99.1	100.2	107.3	102.9	96.0	99.1
F.6 Passenger flown (Km) - International	96.4	101.2	99.6	103.4	102.8	**93.0**	93.5	95.7	107.1	**110.9**	95.0	102.5
Merchandise Trade (3 series)												
G.1 Exports	97.2	101.2	99.0	98.6	97.3	102.4	98.8	**95.0**	102.3	98.0	96.6	**113.8**
G.2 Imports	98.0	103.3	99.3	102.3	98.7	100.9	**104.6**	99.3	100.9	97.9	**92.9**	103.0
G.3 Non-Oil Non-Gold Imports	95.7	99.3	101.3	103.4	99.2	102.0	102.6	101.7	**104.7**	99.2	**91.9**	98.9
Alternate modes of Payment (4 series)												
H.1 RTGS	97.1	95.2	106.6	97.7	92.0	104.2	98.6	91.7	102.2	99.0	89.5	126.4
H.2 Paper Clearing	105.1	99.4	96.5	100.0	95.6	**93.2**	104.5	95.9	99.6	99.1	94.1	**116.5**
H.3 REC	104.1	97.0	98.7	101.8	96.3	97.0	101.0	**90.5**	101.9	99.1	92.2	**121.6**
H.4 Cards	99.8	101.8	98.4	99.6	99.5	95.7	**105.6**	100.2	103.4	101.6	**92.5**	101.5

*: Average of last ten years' monthly seasonal factors, in general. Here, the average monthly seasonal factors have been computed on the basis of last 10 years (i.e., April 2010 to March 2020)

Note:

1. *Seasonal factors:* Deviation from 100 indicates presence of seasonality. For instance, seasonal factor of IIP-Manufacturing increases during March(108.5) and decreases during April (96.0) indicating that manufacturing production rises during March and declines during February due to seasonal fluctuations.
2. For all CPI indices, the average monthly seasonal factors have been computed on the basis of last 9 years (i.e., January 2011 to March 2019).
3. The average linking factor has been used to compute the back series of IIP (Overall, mining, manufacturing and electricity) and WPI series. The average linking factor was calculated based on IIP/ WPI series for the common period from Apr 2012 to Mar 2020. The back series of IIP, however, was not compiled at further disaggregated level (use based and NIC-2 digit level) due to major changes in coverage.
4. Numbers marked in **'bold'** are peaks and troughs of respective series.

Table 4: Range (Difference Between Peak and Trough) of Seasonal Factors *(Contd.)*

Series \ Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Range of Average SF
1	2	3	4	5	6	7	8	9	10	11	12
Monetary and Banking Indicators(14 series)											
A.1.1 Broad Money (M3)	2.3	2.1	1.9	1.8	1.7	1.8	2.0	2.1	2.1	2.1	2.0
A.1.1.1 Net Bank Credit to Government	4.6	4.1	3.8	3.6	3.5	3.6	3.7	3.9	4.0	3.9	3.8
A.1.1.2 Bank Credit to Commercial Sector	3.7	3.3	3.0	2.8	2.7	2.8	3.0	3.1	3.2	3.2	3.1
A.1.2 Narrow Money (M1)	4.7	4.1	4.0	4.2	4.4	5.3	6.1	7.0	7.8	8.2	5.0
A.1.3 Reserve Money (RM)	7.1	6.8	6.4	6.1	5.7	5.4	5.2	4.9	4.8	4.7	6.0
A.1.3.1 Currency in Circulation	5.9	5.6	5.2	5.0	4.8	4.7	4.7	4.7	4.8	4.9	5.2
A.2.1 Aggregate Deposits (SCBs)	2.3	2.0	1.7	1.6	1.5	1.4	1.7	1.9	2.0	2.0	1.5
A.2.1.1 Demand Deposits (SCBs)	11.0	8.5	6.6	6.0	6.9	9.5	11.9	13.9	14.8	15.1	9.3
A.2.1.2 Time Deposits (SCBs)	2.0	1.9	1.6	1.4	1.1	1.0	0.9	0.8	0.8	0.8	1.3
A.3.1 Cash in Hand and Balances with RBI (SCBs)	10.7	9.1	7.0	5.4	4.5	4.9	5.4	5.8	6.0	6.1	5.8
A.3.2 Bank Credit (SCBs)	4.0	3.6	3.2	3.0	2.9	2.9	3.0	3.1	3.2	3.2	3.2
A.3.2.1 Loans, Cash, Credits and Overdrafts (SCBs)	3.7	3.2	2.7	2.4	2.4	2.7	3.0	3.2	3.4	3.5	3.1
A.3.2.2 Non-Food Credit (SCBs)	4.0	3.6	3.1	2.8	2.7	3.1	3.6	3.9	4.0	3.9	3.5
A.3.3 Investments (SCBs)	4.8	4.6	4.4	4.1	3.7	3.5	3.5	3.4	3.4	3.3	4.0
Price Indices [CPI: 21 series and WPI: 9 series]											
B. CPI (Base: 2012 = 100) All Commodities		2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.7	1.7	2.0
B.1 CPI - Food and beverages		4.2	4.2	4.1	4.0	3.9	3.8	3.6	3.6	3.7	3.8
B.1 .1 CPI - Cereals and products		1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.7
B.1 .2 CPI - Meat and fish		3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.1
B.1 .3 CPI - Egg		8.0	7.8	7.5	7.0	6.5	6.2	5.9	5.9	5.9	6.9
B.1 .4 CPI - Milk and products		0.9	0.8	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.6
B.1 .5 CPI - Fruits		6.5	6.5	6.4	6.3	6.2	6.2	6.2	6.4	6.5	6.3
B.1 .6 CPI - Vegetables		24.5	24.5	24.1	23.8	22.8	22.1	21.3	21.7	22.3	23.0
B.1 .6.1 CPI - Potato		38.0	37.9	37.4	36.9	36.3	35.1	33.1	31.8	30.8	35.6
B.1 .6.2 CPI - Onion		45.0	44.7	43.3	42.0	38.8	37.4	37.0	38.0	39.1	40.4
B.1 .6.3 CPI - Tomato		63.1	63.8	65.3	66.1	66.3	66.4	66.6	66.9	67.5	65.6
B.1 .7 CPI - Pulses and products		3.0	3.1	3.2	3.4	3.5	3.4	3.3	3.2	2.5	3.2
B.1 .8 CPI - Spices		1.8	1.7	1.5	1.2	1.1	1.1	1.1	1.0	0.8	1.3
B.1 .9 CPI - Non-alcoholic beverages		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3
B.1 .10 CPI - Prepared meals, snacks, sweets etc.		0.8	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.6
B.2 CPI - Clothing and footwear		0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.5
B.3 CPI - Housing		1.4	1.3	1.2	1.1	1.1	1.2	1.2	1.2	1.3	1.2
B.4 CPI - Miscellaneous		0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.6
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.3	2.2
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)	2.1	2.1	2.2	2.1	2.1	2.1	2.0	1.9	1.7	1.6	2.0
C.3 Consumer Price Index for Rural Labourers (Base: 1986-87=100)	2.1	2.1	2.2	2.1	2.0	2.0	2.0	1.8	1.7	1.6	2.0
D. WPI (Base: 2011-12=100) All Commodities	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.8	0.8	0.8	0.7
D.1 WPI - PRIMARY ARTICLES	1.4	1.3	1.5	1.6	1.7	1.6	1.5	1.4	1.4	1.4	1.3
D.1.1 WPI - Food Articles	3.6	3.9	4.3	4.8	5.1	5.1	4.9	4.6	4.4	4.5	4.4
D.2 WPI - FUEL & POWER	17.3	17.3	18.2	19.8	21.5	22.0	22.2	22.7	23.5	23.3	19.4
D.3 WPI - MANUFACTURED PRODUCTS	5.2	5.2	5.2	5.3	5.6	5.6	5.5	5.5	5.6	5.6	5.3
D.3.1 WPI - Manufacture of Food Products	2.2	2.2	2.3	2.4	2.4	2.2	2.2	2.1	2.0	1.9	2.2
D.3.2 WPI - Manufacture of Chemicals & Chemical Products	2.4	2.9	3.2	3.1	2.9	2.4	1.9	1.5	1.2	1.1	2.3
D.3.3 WPI - Manufacture of Basic Metals Alloys & Metals Products	4.5	4.4	4.5	4.8	5.2	5.3	5.4	5.3	5.3	5.3	4.9
D.3.4 WPI - Manufacture of Machinery & Machine Tools	6.3	6.2	6.5	6.8	7.3	7.2	6.9	6.1	5.4	4.8	6.3

Table 4: Range (Difference Between Peak and Trough) of Seasonal Factors *(Concld.)*

Series \ Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Range of Average SF
1	2	3	4	5	6	7	8	9	10	11	12
Index of Industrial Production (23 series)											
E. IIP (Base 2011-12 = 100) General Index	14.4	14.0	13.4	12.7	12.7	12.9	13.0	13.4	13.5	13.5	13.0
E.1.1 IIP - Primary goods			13.5	13.7	13.8	13.9	14.0	14.1	14.3	14.5	13.9
E.1.2 IIP - Capital goods			39.2	38.4	36.8	35.2	33.2	32.0	31.0	30.8	35.1
E.1.3 IIP - Intermediate goods			10.2	10.2	10.2	10.1	10.2	10.4	10.7	10.8	10.1
E.1.4 IIP - Infrastructure/ construction goods			11.6	12.0	12.3	12.7	13.1	13.6	13.8	14.2	12.7
E.1.5 IIP - Consumer goods			12.0	11.7	11.2	10.7	10.1	9.9	10.1	10.6	10.8
E.1.5.1 IIP - Consumer durables			13.9	13.8	13.3	12.5	11.3	10.3	10.0	9.6	11.9
E.1.5.2 IIP - Consumer non-durables			15.4	15.1	14.3	14.0	13.7	13.9	14.6	15.3	13.8
E.2.1 IIP - Mining	28.0	29.0	29.7	30.5	31.2	32.1	32.9	34.2	35.1	35.6	30.8
E.2.2 IIP - Manufacturing	12.6	12.2	12.0	12.3	12.4	12.6	12.7	13.1	13.2	13.4	12.5
E.2.2.1 IIP - Manufacture of food products			36.3	36.3	35.9	35.9	36.6	37.6	38.5	39.3	36.7
E.2.2.2 IIP - Manufacture of beverages			55.3	54.4	51.3	46.0	39.7	35.3	32.9	33.4	44.5
E.2.2.3 IIP - Manufacture of textiles			8.9	8.5	7.5	6.4	5.2	5.2	5.5	5.7	6.4
E.2.2.4 IIP - Manufacture of chemicals and chemical products			11.1	10.8	10.6	10.9	11.7	12.3	12.6	12.7	10.9
E.2.2.5 IIP - Manufacture of motor vehicles, trailers and semi-trailers			13.5	13.9	14.6	15.6	16.2	16.6	16.5	16.4	15.3
E.2.3 IIP - Electricity	11.3	10.7	11.2	12.0	13.1	14.2	15.5	16.7	17.9	18.4	13.0
E.3 Cement Production	23.3	23.9	23.6	23.3	22.1	21.4	20.9	21.1	21.5	22.0	22.4
E.4 Steel Production	10.3	10.0	10.1	10.1	9.8	9.6	10.0	10.6	11.2	11.6	10.0
E.5 Coal Production	54.6	55.2	55.1	55.0	55.4	56.6	59.1	62.4	65.3	67.1	56.8
E.6 Crude Oil Production	10.2	10.4	10.4	10.4	10.4	10.4	10.5	10.6	10.7	10.8	10.4
E.7 Petroleum Refinery Production	9.3	9.9	10.4	10.6	10.2	9.7	9.5	9.5	9.1	8.8	9.5
E.8 Fertiliser Production	26.7	27.0	27.4	27.3	26.4	24.6	22.8	21.9	21.4	21.9	25.1
E.9 Natural Gas Production	11.1	10.9	10.7	10.9	10.9	11.0	10.9	10.6	10.5	10.7	10.7
Service Sector Indicators (6 series)											
F.1 Production of Commercial Motor Vehicles	28.6	28.7	25.6	24.0	24.1	25.8	25.9	26.2	26.1	27.5	24.7
F.2 Cargo handled at Major Ports	15.9	15.9	14.8	14.6	14.8	15.3	15.6	15.7	15.5	15.4	15.4
F.3 Railway Freight Traffic	20.6	20.6	19.3	18.8	18.3	18.4	19.1	20.3	21.3	22.0	19.7
F.4 Sales of Commercial Motor Vehicles	41.8	41.7	40.7	41.3	41.9	43.2	44.7	46.9	48.5	49.9	43.3
F.5 Passenger flown (Km) - Domestic	25.8	25.8	24.1	22.1	19.7	17.3	15.1	13.6	12.7	12.4	20.1
F.6 Passenger flown (Km) - International	15.2	16.1	16.9	18.1	18.8	19.5	20.0	20.8	21.3	22.1	17.9
Merchandise Trade (3 series)											
G.1 Exports	21.9	21.9	20.9	19.6	17.8	16.4	15.6	16.5	17.3	17.6	18.8
G.2 Imports	14.2	12.8	11.7	11.4	12.4	12.7	12.3	11.4	10.8	10.7	11.8
G.3 Non-Oil Non-Gold Imports	12.7	11.6	12.1	12.3	12.7	13.3	13.9	14.3	14.6	14.6	12.8
Alternate modes of Payment (4 series)											
RTGS	26.9	34.8	39.9	42.6	44.5	44.5	42.5	40.2	38.4	36.9	36.8
Paper Clearing	25.2	25.7	25.3	24.3	22.9	21.9	21.3	21.3	21.5	21.8	23.4
REC	23.3	29.1	33.7	35.9	36.5	36.1	34.8	33.2	31.7	30.6	31.1
Cards	14.3	14.0	13.3	12.6	12.5	12.6	12.8	13.0	12.9	12.9	13.2

Note:

1. Seasonal adjustment for these series is based on 10 years' data depending on availability. Guidelines of both the Office of National Statistics (ONS), UK, and the US Census Bureau, however, suggest using more than ten years' data for estimating stable monthly seasonal factors.
2. Average seasonal factor range is the range of average seasonal factors for last ten years; range is calculated as the difference between maximum and minimum of monthly seasonal factors.

Table 5: Change in Seasonal Peaks and Troughs in 2019-20 *vis-à-vis* previous 5-years
(2014-15 to 2018-19) *(Contd.)*

Series	Based on SF of 2014-15 to 2018-19				Based on SF of 2019-20			
	Peak Month	Peak Value	Trough Month	Trough Value	Peak Month	Peak Value	Trough Month	Trough Value
Monetary and Banking Indicators(14 series)								
A.1.1 Broad Money (M3)	Apr	101.1	Dec	99.2	Apr	101.1	Dec	99.0
A.1.1.1 Net Bank Credit to Government	Jul	101.7	Mar	98.0	Aug	101.7	Mar	97.7
A.1.1.2 Bank Credit to Commercial Sector	Mar	102.0	Aug	99.1	Mar	102.2	Aug	99.0
A.1.2 Narrow Money (M1)	Mar	104.3	Jan	98.3	Mar	105.8	Dec	97.6
A.1.3 Reserve Money (RM)	Mar	103.6	Oct	98.4	Mar	103.1	Nov	98.4
A.1.3.1 Currency in Circulation	May	102.8	Sep	98.0	May	102.8	Sep	97.8
A.2.1 Aggregate Deposits (SCBs)	Mar	101.0	Feb	99.3	Mar	101.2	Feb	99.3
A.2.1.1 Demand Deposits (SCBs)	Mar	108.3	Jan	96.9	Mar	111.4	Jan	96.3
A.2.1.2 Time Deposits (SCBs)	Apr	100.5	Feb	99.6	Apr	100.3	Dec	99.6
A.3.1 Cash in Hand and Balances with RBI (SCBs)	Dec	102.3	Jan	97.6	Mar	104.1	Jul	98.0
A.3.2 Bank Credit (SCBs)	Mar	102.1	Aug	99.1	Mar	102.2	Aug	99.0
A.3.2.1 Loans, Cash Credits and Overdrafts (SCBs)	Mar	101.9	Aug	99.0	Mar	102.3	Aug	98.8
A.3.2.2 Non-Food Credit (SCBs)	Mar	102.4	Aug	99.0	Mar	102.8	Aug	98.9
A.3.3 Investments (SCBs)	Aug	101.2	Mar	97.7	Aug	101.3	Mar	98.0
Price Indices [CPI: 21 series and WPI: 9 series]								
B. CPI (Base: 2012 = 100) All Commodities	Oct	100.9	Mar	99.1	Nov	100.8	Mar	99.1
B.1 CPI - Food and beverages	Aug	101.7	Mar	98.0	Nov	101.7	Mar	98.0
B.1 .1 CPI - Cereals and products	Nov	100.3	May	99.6	Nov	100.3	May	99.7
B.1 .2 CPI - Meat and fish	Jul	102.0	Nov	98.9	Jun	102.1	Oct	98.8
B.1 .3 CPI - Egg	Jan	103.3	May	97.0	Jan	103.1	May	97.1
B.1 .4 CPI - Milk and products	Nov	100.2	Apr	99.7	Oct	100.1	Apr	99.8
B.1 .5 CPI - Fruits	Jul	103.0	Feb	96.7	Jul	102.9	Jan	96.4
B.1 .6 CPI - Vegetables	Oct	110.7	Mar	88.5	Nov	111.3	Mar	89.0
B.1 .6.1 CPI - Potato	Nov	115.2	Feb	80.5	Nov	113.6	Feb	82.7
B.1 .6.2 CPI - Onion	Nov	119.5	May	81.3	Nov	122.9	May	83.8
B.1 .6.3 CPI - Tomato	Jul	139.4	Feb	73.0	Jul	140.7	Feb	73.2
B.1 .7 CPI - Pulses and products	Nov	101.7	Apr	98.4	Sep	101.0	Apr	98.6
B.1 .8 CPI - Spices	Dec	100.5	Apr	99.4	Dec	100.5	Apr	99.6
B.1 .9 CPI - Non-alcoholic beverages	Sep	100.1	Mar	99.8	Aug	100.1	Mar	99.9
B.1 .10 CPI - Prepared meals, snacks, sweets etc.	Nov	100.2	May	99.8	Nov	100.2	Jun	99.9
B.2 CPI - Clothing and footwear	Dec	100.2	May	99.8	Dec	100.2	Mar	99.9
B.3 CPI - Housing	Nov	100.4	Jun	99.2	Nov	100.4	Jun	99.1
B.4 CPI - Miscellaneous	Sep	100.2	Apr	99.8	Nov	100.2	Jun	99.8
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	Aug	101.2	Mar	98.8	Aug	101.2	Mar	98.9
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)	Nov	100.9	Apr	98.9	Dec	100.7	Apr	99.1
C.3 Consumer Price Index for Rural Labourers (Base: 1986-87=100)	Nov	100.9	Apr	98.9	Dec	100.7	Apr	99.1
D. WPI (Base: 2011-12=100) All Commodities	Aug	100.3	Mar	99.7	Aug	100.4	Feb	99.6
D.1 WPI - PRIMARY ARTICLES	Oct	100.6	Mar	99.2	Nov	100.7	Mar	99.3
D.1.1 WPI - Food Articles	Aug	102.1	Mar	97.4	Nov	101.9	Mar	97.4
D.2 WPI - FUEL & POWER	Oct	109.2	Mar	87.6	Nov	110.6	Mar	87.3
D.3 WPI - MANUFACTURED PRODUCTS	Oct	102.2	Mar	96.8	Nov	102.5	Mar	96.9
D.3.1 WPI - Manufacture of Food Products	Nov	100.9	Apr	98.8	Nov	100.8	Apr	98.9
D.3.2 WPI - Manufacture of Chemicals & Chemical Products	Sep	101.0	Mar	99.0	Oct	100.6	Mar	99.5
D.3.3 WPI - Manufacture of Basic Metals Alloys & Metals Products	Jan	102.7	Jun	97.4	Feb	102.6	Jun	97.4
D.3.4 WPI - Manufacture of Machinery & Machine Tools	Oct	103.4	Apr	97.1	Nov	102.4	Apr	97.6

Table 5: Change in Seasonal Peaks and Troughs in 2019-20 *vis-à-vis* previous 5-years (2014-15 to 2018-19) *(Concld.)*

Series	Based on SF of 2014-15 to 2018-19				Based on SF of 2019-20			
	Peak Month	Peak Value	Trough Month	Trough Value	Peak Month	Peak Value	Trough Month	Trough Value
Industrial Production (23 series)								
E. IIP (Base 2011-12 =A51:A72 100) General Index	Mar	109.3	Apr	96.2	Mar	109.7	Apr	96.2
E.1.1 IIP - Primary goods	Mar	108.9	Sep	94.9	Mar	109.3	Sep	94.8
E.1.2 IIP - Capital goods	Mar	123.1	Apr	89.5	Mar	121.5	Apr	90.7
E.1.3 IIP - Intermediate goods	Mar	107.8	Feb	97.7	Mar	108.3	Apr	97.5
E.1.4 IIP - Infrastructure/ construction goods	Mar	107.5	Nov	94.5	Mar	108.9	Sep	94.7
E.1.5 IIP - Consumer goods	Mar	105.7	Apr	95.4	Mar	105.5	Jun	94.9
E.1.5.1 IIP - Consumer durables	Oct	107.3	Apr	96.1	Oct	105.8	Feb	96.2
E.1.5.2 IIP - Consumer non-durables	Mar	108.1	Apr	94.4	Dec	107.9	Jun	92.7
E.2.1 IIP - Mining	Mar	121.0	Sep	88.2	Mar	121.8	Aug	86.2
E.2.2 IIP - Manufacturing	Mar	108.3	Apr	95.5	Mar	108.7	Apr	95.3
E.2.2.1 IIP - Manufacture of food products	Dec	122.5	Jun	85.6	Dec	124.0	Jun	84.7
E.2.2.2 IIP - Manufacture of beverages	May	127.7	Nov	87.0	May	122.3	Oct	88.9
E.2.2.3 IIP - Manufacture of textiles	Aug	101.9	Feb	96.4	Dec	102.8	Feb	97.1
E.2.2.4 IIP - Manufacture of chemicals and chemical products	Mar	105.4	Feb	93.9	Mar	107.0	Feb	94.4
E.2.2.5 IIP - Manufacture of motor vehicles, trailers and semi-trailers	Mar	108.5	Dec	92.6	Mar	108.9	Dec	92.5
E.2.3 IIP - Electricity	May	106.2	Feb	90.8	May	108.0	Feb	89.6
E.3 Cement Production	Mar	111.9	Aug	90.5	Mar	112.1	Aug	90.1
E.4 Steel Production	Mar	106.7	Nov	96.6	Mar	108.5	Sep	96.9
E.5 Coal Production	Mar	140.1	Aug	80.3	Mar	144.4	Aug	77.3
E.6 Crude Oil Production	Mar	102.7	Feb	92.2	Mar	103.0	Feb	92.1
E.7 Petroleum Refinery Production	Mar	104.4	Feb	94.9	Mar	103.6	Feb	94.8
E.8 Fertiliser Production	Oct	106.3	Apr	83.0	Dec	105.1	Apr	83.3
E.9 Natural Gas Production	Oct	102.7	Feb	92.0	Dec	103.2	Feb	92.6
Service Sector Indicators (6 series)								
F.1 Production of Commercial Motor Vehicles	Mar	116.5	Dec	90.9	Mar	118.5	Aug	91.0
F.2 Cargo handled at Major Ports	Mar	108.9	Sep	93.5	Mar	108.8	Sep	93.4
F.3 Railway Freight Traffic	Mar	113.3	Sep	93.8	Mar	114.7	Sep	92.7
F.4 Sales of Commercial Motor Vehicles	Mar	131.6	Apr	86.6	Mar	134.9	Apr	85.0
F.5 Passenger flown (Km) - Domestic	May	108.7	Sep	93.0	May	106.7	Sep	94.3
F.6 Passenger flown (Km) - International	Jan	112.6	Sep	92.6	Jan	114.4	Sep	92.4
Merchandise Trade (3 series)								
G.1 Exports	Mar	112.8	Nov	96.4	Mar	113.4	Jul	95.8
G.2 Imports	Mar	104.8	Feb	92.9	Mar	103.7	Feb	92.9
G.3 Non-Oil Non-Gold Imports	Dec	104.9	Feb	91.1	Dec	104.7	Feb	90.1
Alternate modes of Payment (4 series)								
H.1 RTGS	Mar	129.9	Feb	87.9	Mar	125.4	Feb	88.4
H.2 Paper Clearing	Mar	115.4	Sep	93.6	Mar	115.0	Sep	93.3
H.3 REC	Mar	125.8	Nov	91.4	Mar	123.9	Nov	93.3
H.4 Cards	Oct	105.4	Feb	92.6	Oct	106.2	Feb	93.4

Table 6: Change in Seasonal Variation in 2019-20 *vis-à-vis* previous 5-years (2014-15 to 2018-19)

Name of Variable	2019-20	Average Range*	Change	Name of Variable	2019-20	Average Range*	Change
1	2	3	4	5	6	7	8
Monetary and Banking Indicators (14 serties)				D.3.2 WPI - Manufacture of Chemicals & Chemical Products	1.1	2.0	-0.9
A.1.1 Broad Money (M3)	2.1	2.0	0.2	D.3.3 WPI - Manufacture of Basic Metals Alloys & Metals Products	5.3	5.3	0.0
A.1.1.1 Net Bank Credit to Government	3.9	3.7	0.3	D.3.4 WPI - Manufacture of Machinery & Machine Tools	4.8	6.3	-1.5
A.1.1.2 Bank Credit to Commercial Sector	3.2	2.9	0.2	**Industrial Production (23 series)**			
A.1.2 Narrow Money (M1)	8.2	6.0	2.3	E. IIP (Base 2011-12 = 100) General Index	13.5	13.1	0.5
A.1.3 Reserve Money (RM)	4.7	5.2	-0.5	E.1.1 IIP - Primary goods	14.5	14.0	0.5
A.1.3.1 Currency in Circulation	4.9	4.7	0.2	E.1.2 IIP - Capital goods	30.8	33.6	-2.8
A.2.1 Aggregate Deposits (SCBs)	2.0	1.6	0.3	E.1.3 IIP - Intermediate goods	10.8	10.1	0.7
A.2.1.1 Demand Deposits (SCBs)	15.1	11.4	3.8	E.1.4 IIP - Infrastructure/ construction goods	14.2	13.0	1.2
A.2.1.2 Time Deposits (SCBs)	0.8	0.9	-0.2	E.1.5 IIP - Consumer goods	10.6	10.4	0.2
A.3.1 Cash in Hand and Balances with RBI (SCBs)	6.1	4.7	1.3	E.1.5.1 IIP - Consumer durables	9.6	11.2	-1.6
A.3.2 Bank Credit (SCBs)	3.2	3.0	0.2	E.1.5.2 IIP - Consumer non-durables	15.3	13.7	1.6
A.3.2.1 Loans, Cash, Credits and Overdrafts (SCBs)	3.5	2.9	0.5	E.2.1 IIP - Mining	35.6	32.9	2.7
A.3.2.2 Non-Food Credit (SCBs)	3.9	3.4	0.5	E.2.2 IIP - Manufacturing	13.4	12.8	0.6
A.3.3 Investments (SCBs)	3.3	3.5	-0.2	E.2.2.1 IIP - Manufacture of food products	39.3	36.9	2.4
Price Indices[CPI: 21 series and WPI: 9 series]				E.2.2.2 IIP - Manufacture of beverages	33.4	40.7	-7.3
B. CPI (Base: 2012 = 100) All Commodities	1.7	1.8	-0.1	E.2.2.3 IIP - Manufacture of textiles	5.7	5.5	0.2
B.1 CPI - Food and beverages	3.7	3.8	-0.1	E.2.2.4 IIP - Manufacture of chemicals and chemical products	12.7	11.5	1.2
B.1 .1 CPI - Cereals and products	0.6	0.7	-0.1	E.2.2.5 IIP - Manufacture of motor vehicles, trailers and semi-trailers	16.4	15.9	0.5
B.1 .2 CPI - Meat and fish	3.3	3.1	0.2	E.2.3 IIP - Electricity	18.4	15.5	2.9
B.1 .3 CPI - Egg	5.9	6.3	-0.3	E.3 Cement Production	22.0	21.4	0.6
B.1 .4 CPI - Milk and products	0.3	0.5	-0.1	E.4 Steel Production	11.6	10.1	1.6
B.1 .5 CPI - Fruits	6.5	6.3	0.3	E.5 Coal Production	67.1	59.8	7.4
B.1 .6 CPI - Vegetables	22.3	22.2	0.1	E.6 Crude Oil Production	10.8	10.5	0.3
B.1 .6.1 CPI - Potato	30.8	34.7	-3.8	E.7 Petroleum Refinery Production	8.8	9.5	-0.6
B.1 .6.2 CPI - Onion	39.1	38.2	0.9	E.8 Fertiliser Production	21.9	23.3	-1.5
B.1 .6.3 CPI - Tomato	67.5	66.5	1.0	E.9 Natural Gas Production	10.7	10.7	-0.1
B.1 .7 CPI - Pulses and products	2.5	3.3	-0.9	**Service sector Indicators (6 series)**			
B.1 .8 CPI - Spices	0.8	1.1	-0.3	F.1 Production of Commercial Motor Vehicles	27.5	25.6	2.0
B.1 .9 CPI - Non-alcoholic beverages	0.2	0.3	-0.1	F.2 Cargo handled at Major Ports	15.4	15.4	0.0
B.1 .10 CPI - Prepared meals, snacks, sweets etc.	0.4	0.5	-0.1	F.3 Railway Freight Traffic	22.0	19.5	2.5
B.2 CPI - Clothing and footwear	0.3	0.4	-0.1	F.4 Sales of Commercial Motor Vehicles	49.9	45.0	4.9
B.3 CPI - Housing	1.3	1.2	0.1	F.5 Passenger flown (Km) - Domestic	12.4	15.7	-3.3
B.4 CPI - Miscellaneous	0.3	0.4	-0.1	F.6 Passenger flown (Km) - International	22.1	20.1	2.0
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	2.3	2.4	-0.1	**Merchandise Trade (3 series)**			
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)	1.6	2.0	-0.3	G.1 Exports	17.6	16.4	1.2
				G.2 Imports	10.7	11.9	-1.2
C.3 Consumer Price Index for Rural Labourers (Base: 1986-87=100)	1.6	1.9	-0.3	G.3 Non-Oil Non-Gold Imports	14.6	13.8	0.8
D. WPI (Base: 2011-12=100) All Commodities	0.8	0.7	0.2	**Alternate modes of Payment (4 series)**			
D.1 WPI - PRIMARY ARTICLES	1.4	1.4	0.0	H.1 RTGS	36.9	42.0	-5.0
D.1.1 WPI - Food Articles	4.5	4.8	-0.3	H.2 Paper Clearing	21.8	21.8	0.0
D.2 WPI - FUEL & POWER	23.3	21.7	1.6	H.3 REC	30.6	34.5	-3.9
D.3 WPI - MANUFACTURED PRODUCTS	5.6	5.4	0.2	H.4 Cards	12.9	12.8	0.1
D.3.1 WPI - Manufacture of Food Products	1.9	2.2	-0.2				

*Average Range of Monthly Seasonal Factors of 5 year ending 2018-19.

Table 7: List of Top-Twenty and Bottom-Twenty Series Based on Average Range of Monthly Seasonal Factors During Last Five Years (2015-16 to 2019-20) and Corresponding Peak and Trough Months

Name of Top-Twenty Series	Average Range	Peak Month	Trough Month
1	2	3	4
B.1 .6.3 CPI - Tomato	65.6	Jul	Feb
E.5 Coal Production	56.8	Mar	Aug
E.2.2.2 IIP - Manufacture of beverages	44.5	May	Aug
F.4 Sales of Commercial Motor Vehicles	43.3	Mar	Apr
B.1 .6.2 CPI - Onion	40.4	Nov	May
H.1 RTGS	36.8	Mar	Feb
E.2.2.1 IIP - Manufacture of food products	36.7	Dec	Jun
B.1 .6.1 CPI - Potato	35.6	Nov	Feb
E.1.2 IIP - Capital goods	35.1	Mar	Apr
H.3 REC	31.1	Mar	Nov
E.2.1 IIP - Mining	30.8	Mar	Sep
E.8 Fertiliser Production	25.1	Oct	Apr
F.1 Production of Commercial Motor Vehicles	24.7	Mar	Jun
H.2 Paper Clearing	23.4	Mar	Sep
B.1 .6 CPI - Vegetables	23.0	Oct	Mar
E.3 Cement Production	22.4	Mar	Aug
F.5 Passenger flown (Km) - Domestic	20.1	May	Sep
F.3 Railway Freight Traffic	19.7	Mar	Sep
D.2 WPI - FUEL & POWER	19.4	Nov	Feb
G.1 Exports	18.8	Mar	Nov
B.1 .9 CPI - Non-alcoholic beverages	0.3	Sep	Mar
B.2 CPI - Clothing and footwear	0.5	Dec	Jun
B.1 .10 CPI - Prepared meals, snacks, sweets etc.	0.6	Nov	May
B.4 CPI - Miscellaneous	0.6	Sep	Apr
B.1 .4 CPI - Milk and products	0.6	Nov	Apr
B.1 .1 CPI - Cereals and products	0.7	Oct	May
D. WPI (Base: 2011-12=100) All Commodities	0.7	Oct	Mar
B.3 CPI - Housing	1.2	Jan	Jun
B.1 .8 CPI - Spices	1.3	Dec	Apr
A.2.1.2 Time Deposits (SCBs)	1.3	Apr	Dec
B.1 WPI - Primary Articles	1.3	Sep	Feb
A.2.1 Aggregate Deposits (SCBs)	1.5	Apr	Dec
B. CPI (Base: 2012 = 100) All Commodities	2.0	Oct	Mar
C.3 Consumer Price Index for Rural Labourers (Base: 198687=100)	2.0	Nov	Apr
C.2 Consumer Price Index for Agricultural Labourers (Base: 1986-87=100)	2.0	Nov	Apr
A.1.1 Broad Money (M3)	2.0	Apr	Dec
D.3.1 WPI - Manufacture of Food Products	2.2	Nov	Apr
C.1 Consumer Price Index for Industrial Workers (Base: 2001=100)	2.2	Nov	Apr
D.3.2 WPI - Manufacture of Chemicals & Chemical Products	2.3	Oct	Mar
A.3.3.1 Loans, Cash, Credits and Overdrafts (SCBs)	3.1	Mar	Aug