



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Inclusive and Sustainable Industrial Development Working Paper Series  
WP 4 | 2020

# THE INFLUENCE OF SEASONAL ADJUSTMENT AND CALENDAR EFFECTS ON THE TIME SERIES OF RUSSIA'S MANUFACTURING SECTOR AT THE 2-DIGIT LEVEL SINCE 2010

DEPARTMENT OF POLICY, RESEARCH AND STATISTICS

WORKING PAPER 4/2020

**The influence of seasonal adjustment and calendar effects on the time series of Russia's manufacturing sector at the 2-digit level since 2010**

Artem Dushechkin  
Federal State Statistics Service of Russian Federation  
UNIDO Consultant



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna, 2020

The designations employed, descriptions and classifications of countries, and the presentation of the material in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. The views expressed in this paper do not necessarily reflect the views of the Secretariat of the UNIDO. The responsibility for opinions expressed rests solely with the authors, and publication does not constitute an endorsement by UNIDO. Although great care has been taken to maintain the accuracy of information herein, neither UNIDO nor its member States assume any responsibility for consequences which may arise from the use of the material. Terms such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment. Any indication of, or reference to, a country, institution or other legal entity does not constitute an endorsement. Information contained herein may be freely quoted or reprinted but acknowledgement is requested. This report has been produced without formal United Nations editing.

## Table of Contents

1. Introduction.....	1
1.1 Seasonal adjustment.....	9
1.2 Calendar effects.....	13
2. Results and recommendations.....	17
3. Methodological aspects.....	18
Appendix.....	20

## List of Tables

Table 1: Time series of total manufacturing.....	4
Table 2: ISIC13.....	28
Table 3: ISIC14.....	33
Table 4: ISIC15.....	38
Table 5: ISIC18.....	43
Table 6: ISIC22.....	48
Table 7: ISIC 23.....	53
Table 8: ISIC25.....	59
Table 9: ISIC26.....	64
Table 10: ISIC27.....	69
Table 11: ISIC31.....	74

## List of Figures

Figure 1: Original time series (yellow), seasonal adjustment + calendar effects (blue), trend component (green).....	2
Figure 2: Original time series.....	2
Figure 3: Seasonally adjusted time series, including calendar effects.....	3
Figure 4: Seasonally adjusted time series without calendar effects.....	15
Figure 5: Seasonally adjusted time series including calendar effects.....	15
Figure 6: ISIC 10 (Food products).....	20
Figure 7: ISIC 11 (Beverages).....	20
Figure 8: ISIC 12 (Tobacco products).....	20

Figure 9: ISIC 13 (Textiles) .....	21
Figure 10: ISIC 14 (Wearing apparel) .....	21
Figure 11: ISIC 15 (Leather and related products) .....	21
Figure 12: ISIC 16 (Wood and products of wood and cork, except furniture; articles of straw and plaiting materials) .....	22
Figure 13: ISIC 17 (Paper and paper products) .....	22
Figure 14: ISIC 18 (Printing and reproduction of recorded media).....	22
Figure 15: ISIC 19 (Coke and refined petroleum products) .....	23
Figure 16: ISIC 20 (Chemicals and chemical products) .....	23
Figure 17: ISIC 21 (Pharmaceuticals, medicinal chemical and botanical products) .....	23
Figure 18: ISIC 22 (Rubber and plastics products).....	24
Figure 19: ISIC 23 (Other non-metallic mineral products).....	24
Figure 20: ISIC 24 (Basic metals).....	24
Figure 21: ISIC 25 (Fabricated metal products, except machinery and equipment) .....	25
Figure 22: ISIC 26 (Computer, electronic and optical products).....	25
Figure 23: ISIC 27 (Electrical equipment).....	25
Figure 24: ISIC 28 (Machinery and equipment n.e.c.) .....	26
Figure 25: ISIC 29 (Motor vehicles, trailers and semi-trailers).....	26
Figure 26: ISIC 30 (Other transport equipment).....	26
Figure 27: ISIC 31 (Furniture) .....	27
Figure 28: ISIC 32 (Other manufacturing) .....	27
Figure 29: ISIC 33 (Repair and installation of machinery and equipment .....	27

## **Abstract**

This study analyses the influence of seasonal adjustment and national calendar effects on the time series of Russia's manufacturing sector (ISIC Section C) at the 2-digit level for the period 2010–2019.

Rosstat publishes non-adjusted time series on its official website under the section **Industrial Production > Indices of Industrial Production**. Time series are provided for Sections BCDE in full compliance with ISIC Rev. 3 with the base year 2010.

Additional data used in this study were taken from the national calendar of Russia for the period 1960–2019 and the seasonally adjusted time series based on that calendar, which serve internal purposes (yearbooks, reports, etc.).

The analysis is conducted using JDemetra+, which allows for an automatic production of advanced seasonally adjusted time series based on the national calendar.

This study consists of three major parts:

1. An analysis of applying seasonal adjustment to the time series downloaded from Rosstat's official website (raw data without seasonal adjustment and calendar effects);
2. An analysis of applying national calendar effects to seasonally adjusted time series (series from part 1);
3. Results and recommendations based on this analysis.

## 1. Introduction

Seasonal adjustment is used to estimate and remove seasonal and calendar-related shifts from time series, resulting in data that present a clearer picture of economic trends. JDemetra+ is a tool that can be used for seasonal adjustment based on TRAMO/SEATS and X-12-ARIMA in full compliance with ESS Guidelines on Seasonal Adjustment (2015)<sup>1</sup>. UNIDO primarily uses TRAMO/SEATS which the following analysis is based on.

The main aim of seasonal adjustment is to provide reliable results for datasets. Seasonal adjustment consists of two major steps. The first one is pre-adjustment, which removes the deterministic effects from the series by means of a regression model with ARIMA noise. The second step is the decomposition of the time series to estimate and remove seasonal components. Both steps are required to obtain the most reliable data and to present the real economic situation in a given country.

Seasonality tests allow to detect and identify extreme results and trend shifts in the form of economic outliers that should be further analysed. The results are provided in green, yellow or red text, depending on the result of the statistical test used. Those in green denote that the problematic characteristic has not been detected. The results in yellow indicate that the test outcome is uncertain. The red results denote the existence of an unresolved issue that needs to be addressed. The user should investigate the problematic test statistics and try to improve the model to eliminate any ambiguous or rejected results of the seasonality tests.

Simple seasonal adjustment of multiple time series is intended for the seasonal adjustment of a dataset of multiple time series. This is particularly useful when numerous series need to be processed and the quality of their adjustment assessed. It is not recommended for the adjustment of key indicators, which requires a detailed analysis of the results as this approach does not focus on individual series.

The functionality of JDemetra+ allows keeping track of calendar effects within time series. To make the data more realistic and reliable, we can use the national calendar excluding all holidays and non-business days in a year. This can be achieved by either uploading a national calendar designed for a certain period of time or by manually selecting those days considered holidays or non-business days using a special tool in JDemetra+.

---

<sup>1</sup> <https://ec.europa.eu/eurostat/documents/3859598/6830795/KS-GQ-15-001-EN-N.pdf>

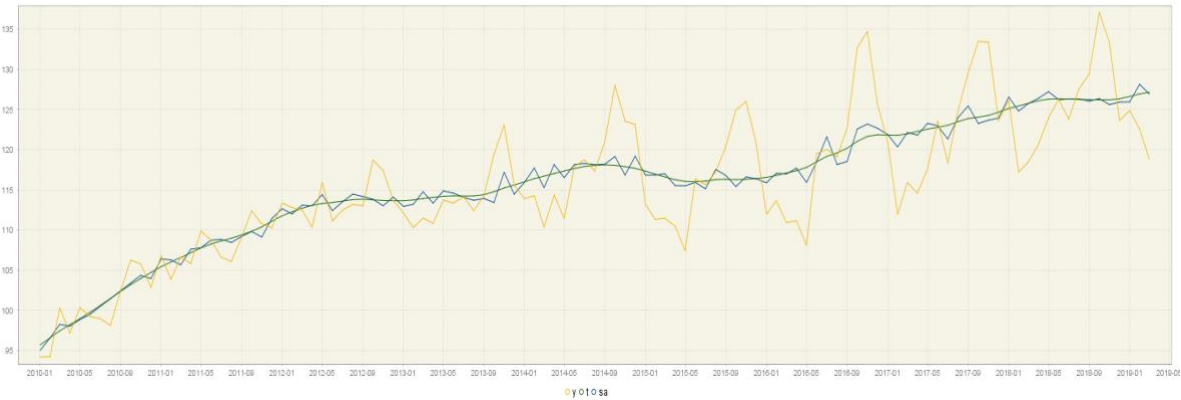
The Russian national calendar used in this analysis was designed by Rosstat. When the government publishes a national calendar for a specific year including all national holidays of the Russian Federation, this calendar (applied to a time series in JDemetra+) is revised to account for all holidays and non-business days.

When a calendar is composed and uploaded into the JDemetra+ workspace, the programme automatically provides regression parameters for time series. Generally, there are seven parameters – days of the week excluding Sundays (permanent non-business day) and leap year. The parameters for the leap year are predefined while parameters for business days are calculated as a subtraction of a number of business days each month (Mondays to Saturdays) from a number of Sundays in the same month. The figures are then presented in a table, forming a regression model that can be applied to the time series.

The analysis entails a comparison of original time series and time series after seasonal adjustment and the application of the national calendar in table and chart forms. Figures 1-3 illustrate the dynamics of original time series and seasonally adjusted time series, including calendar effects, starting with the year 2010. The table presents the original figures of the monthly IIP and seasonally adjusted monthly indices, including calendar effects, starting with the year 2010.

The figures below reflect the dynamics of manufacturing total IIP on each level of the analysis.

**Figure 1: Original time series (yellow), seasonal adjustment + calendar effects (blue), trend component (green)**





**Figure 2: Original time series**



**Figure 3: Seasonally adjusted time series, including calendar effects**



**Table 1: Time series of total manufacturing**

	<b>Original TS</b>	<b>Seasonally adjusted TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Calendar effects (III-II)</b>	<b>Difference (III-I)</b>
<b>Date</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	94.21	94.8	95.03	0.23	0.82
2/1/2010	94.25	96.41	96.55	0.14	2.3
3/1/2010	100.31	98.26	98.26	0	-2.05
4/1/2010	97.18	98.03	98.04	0.01	0.86
5/1/2010	100.35	99.03	98.86	-0.17	-1.49
6/1/2010	99.22	99.52	99.51	-0.01	0.29
7/1/2010	99	100.49	100.49	0	1.49
8/1/2010	98.14	101.41	101.44	0.03	3.3
9/1/2010	102.43	102.44	102.44	0	0.01
10/1/2010	106.25	103.38	103.39	0.01	-2.86
11/1/2010	105.79	104.26	104.36	0.1	-1.43
12/1/2010	102.87	103.98	103.96	-0.02	1.09
1/1/2011	106.83	106.51	106.4	-0.11	-0.43
2/1/2011	103.86	106.21	106.28	0.07	2.42
3/1/2011	106.63	105.52	105.67	0.15	-0.96
4/1/2011	105.83	107.59	107.61	0.02	1.78
5/1/2011	109.88	107.88	107.79	-0.09	-2.09
6/1/2011	108.74	108.96	108.74	-0.22	0
7/1/2011	106.62	108.73	108.84	0.11	2.22
8/1/2011	106.09	108.44	108.45	0.01	2.36
9/1/2011	109.09	109.2	109.2	0	0.11
10/1/2011	112.41	109.72	109.82	0.1	-2.59
11/1/2011	110.77	109.03	109.13	0.1	-1.64
12/1/2011	110.28	111.24	111.44	0.2	1.16

	Original TS	Seasonally adjusted TS	Seasonally adjusted TS incl. calendar effects	Calendar effects (III-II)	Difference (III-I)
Date	I	II	III	IV	V
1/1/2012	113.35	112.79	112.65	-0.14	-0.7
2/1/2012	112.79	111.84	112	0.16	-0.79
3/1/2012	112.5	113.05	113.08	0.03	0.58
4/1/2012	110.38	112.79	113.01	0.22	2.63
5/1/2012	115.93	114.06	114.41	0.35	-1.52
6/1/2012	111.13	112.04	112.4	0.36	1.27
7/1/2012	112.48	113.45	113.51	0.06	1.03
8/1/2012	113.2	114.45	114.48	0.03	1.28
9/1/2012	113.02	114.01	114.17	0.16	1.15
10/1/2012	118.71	113.81	113.83	0.02	-4.88
11/1/2012	117.41	113.34	113.01	-0.33	-4.4
12/1/2012	113.69	114.31	114.11	-0.2	0.42
1/1/2013	112.1	112.71	112.93	0.22	0.83
2/1/2013	110.31	113.37	113.2	-0.17	2.89
3/1/2013	111.49	114.48	114.76	0.28	3.27
4/1/2013	110.82	113.37	113.35	-0.02	2.53
5/1/2013	113.72	114.51	114.87	0.36	1.15
6/1/2013	113.36	114.54	114.59	0.05	1.23
7/1/2013	114.17	114.03	114.08	0.05	-0.09
8/1/2013	112.4	113.62	113.7	0.08	1.3
9/1/2013	114.26	113.83	113.93	0.1	-0.33
10/1/2013	119.42	113.37	113.42	0.05	-6
11/1/2013	123.05	117.01	117.19	0.18	-5.86
12/1/2013	115.63	114.22	114.45	0.23	-1.18
1/1/2014	113.9	115.92	115.94	0.02	2.04
2/1/2014	114.28	117.91	117.72	-0.19	3.44

	Original TS	Seasonally adjusted TS	Seasonally adjusted TS incl. calendar effects	Calendar effects (III-II)	Difference (III-I)
Date	I	II	III	IV	V
3/1/2014	110.37	115.37	115.27	-0.1	4.9
4/1/2014	114.37	118.05	118.14	0.09	3.77
5/1/2014	111.45	116.39	116.52	0.13	5.07
6/1/2014	117.89	117.86	118.14	0.28	0.25
7/1/2014	118.74	118.2	118.27	0.07	-0.47
8/1/2014	117.35	117.99	118.13	0.14	0.78
9/1/2014	121	118.12	118.18	0.06	-2.82
10/1/2014	128.02	119.09	119.15	0.06	-8.87
11/1/2014	123.54	116.49	116.84	0.35	-6.7
12/1/2014	123.14	119.09	119.18	0.09	-3.96
1/1/2015	113.21	116.56	116.84	0.28	3.63
2/1/2015	111.31	116.5	116.85	0.35	5.54
3/1/2015	111.48	117.18	117	-0.18	5.52
4/1/2015	110.48	115.45	115.53	0.08	5.05
5/1/2015	107.44	115.65	115.5	-0.15	8.06
6/1/2015	116.36	115.75	115.93	0.18	-0.43
7/1/2015	115.65	115.06	115.13	0.07	-0.52
8/1/2015	117.23	117.36	117.55	0.19	0.32
9/1/2015	120.4	116.7	116.8	0.1	-3.6
10/1/2015	124.94	115.28	115.41	0.13	-9.53
11/1/2015	126.01	116.51	116.62	0.11	-9.39
12/1/2015	120.8	116.29	116.38	0.09	-4.42
1/1/2016	111.97	115.57	115.88	0.31	3.91
2/1/2016	113.65	116.98	117.08	0.1	3.43
3/1/2016	110.92	116.6	116.97	0.37	6.05
4/1/2016	111.14	117.62	117.7	0.08	6.56

	Original TS	Seasonally adjusted TS	Seasonally adjusted TS incl. calendar effects	Calendar effects (III-II)	Difference (III-I)
Date	I	II	III	IV	V
5/1/2016	108.08	115.9	115.92	0.02	7.84
6/1/2016	119.5	118.78	118.48	-0.3	-1.02
7/1/2016	120.04	121.42	121.61	0.19	1.57
8/1/2016	119.11	118.09	118.14	0.05	-0.97
9/1/2016	122.69	118.46	118.53	0.07	-4.16
10/1/2016	132.69	122.38	122.57	0.19	-10.12
11/1/2016	134.71	122.92	123.2	0.28	-11.51
12/1/2016	125.63	122.55	122.66	0.11	-2.97
1/1/2017	120.93	122.31	121.88	-0.43	0.95
2/1/2017	111.94	120.04	120.34	0.3	8.4
3/1/2017	115.91	122.14	122.12	-0.02	6.21
4/1/2017	114.59	121.71	121.81	0.1	7.22
5/1/2017	117.59	123.07	123.28	0.21	5.69
6/1/2017	123.56	122.8	122.98	0.18	-0.58
7/1/2017	118.36	121.17	121.33	0.16	2.97
8/1/2017	124.83	123.88	123.99	0.11	-0.84
9/1/2017	129.56	125.31	125.45	0.14	-4.11
10/1/2017	133.49	123.12	123.26	0.14	-10.23
11/1/2017	133.36	123.73	123.66	-0.07	-9.7
12/1/2017	123.62	123.84	123.93	0.09	0.31
1/1/2018	126.13	126.21	126.54	0.33	0.41
2/1/2018	117.21	124.49	124.8	0.31	7.59
3/1/2018	118.46	125.48	125.74	0.26	7.28
4/1/2018	120.66	126.15	126.39	0.24	5.73
5/1/2018	123.94	127	127.22	0.22	3.28
6/1/2018	126.28	125.89	126.22	0.33	-0.06

	Original TS	Seasonally adjusted TS	Seasonally adjusted TS incl. calendar effects	Calendar effects (III-II)	Difference (III-I)
Date	I	II	III	IV	V
7/1/2018	123.81	126.22	126.33	0.11	2.52
8/1/2018	127.57	126.17	126.32	0.15	-1.25
9/1/2018	129.43	125.85	126.04	0.19	-3.39
10/1/2018	137.09	126.27	126.36	0.09	-10.73
11/1/2018	133.36	125.56	125.61	0.05	-7.75
12/1/2018	123.62	125.73	125.92	0.19	2.3
1/1/2019	124.87	125.81	125.95	0.14	1.08
2/1/2019	122.6	128.38	128.13	-0.25	5.53
3/1/2019	118.82	126.89	126.93	0.04	8.11
4/1/2019	123.02	127.33	127.31	-0.02	4.29
5/1/2019	125.17	127.52	127.48	-0.04	2.31
6/1/2019	127.37	127.71	127.66	-0.05	0.29
7/1/2019	126.56	127.9	127.83	-0.07	1.27
8/1/2019	128.79	128.09	128.01	-0.08	-0.78
9/1/2019	132.77	128.28	128.18	-0.1	-4.59
10/1/2019	139.56	128.47	128.36	-0.11	-11.2
11/1/2019	135.36	128.67	128.54	-0.13	-6.82
12/1/2019	127.22	128.86	128.71	-0.15	1.49
1/1/2020	127.65	129.05	128.89	-0.16	1.24
2/1/2020	127.44	129.24	129.07	-0.17	1.63
3/1/2020	121.91	129.43	129.24	-0.19	7.33

## 1.1 Seasonal adjustment

The starting point of our analysis is an application of seasonal adjustment to the original time series of total manufacturing (ISIC sector C) indices of the Russian Federation. The original indices reflect the dynamics of total industrial production of Russia's manufacturing sector.

The first figure provides insights about the overall time series dynamics. It combines original time series of the Russian Federation calculated by Rosstat and published on Rosstat's official website<sup>2</sup> (yellow curve), seasonally adjusted time series with calendar effects (blue curve) and trend dynamics (green curve).

The second figure, which presents an upward trend of indices, usually reaches its peak values in October or November of each year, while the most significant decline in total manufacturing production occurs in the spring months – from March to May. This reflects a national pattern, namely the fact that in the spring months and especially in May, there are a number of holidays in Russia while there are none in months like October or November, i.e. there are more business days in autumn and thus higher productivity.

Overall, the total IIP of the manufacturing sector rose from 94.21 per cent in January 2010 to 118.82 per cent in March 2019, reaching its peaks in November 2016 (134.71 per cent) and October 2018 (137.09 per cent). The most visible declines were recorded in May 2015 (107.44 per cent) and in May 2016 (108.08 per cent).

An in-depth analysis of ISIC 2-digit industries in the Russian Federation explains the causality of these dynamics. The growth periods are mainly driven by a sharp increase in the manufacturing of food products (division 10), of computer, electronic and optical products (division 26), of electrical equipment (division 27), and of machinery and equipment (division 28). The share of these industries in total manufacturing as well as their average growth rates account for the dynamics of total manufacturing. Typically, the output of these industries tends to grow in the fourth quarter of the year, which is considered the period of highest productivity.

Meanwhile, the decline of total manufacturing is mostly explained by the slowdown in the manufacturing of basic metals (division 24), of other transport equipment (division 30), of tobacco products (division 12) and of textiles (division 13). The decline in production of these industries is

---

<sup>2</sup> [https://gks.ru/enterprise\\_industrial](https://gks.ru/enterprise_industrial)

evident in the first and second quarters of the year, when the lion's share of holidays and non-business days occur.

The figures of 2-digit divisions of the manufacturing sector C are presented in the Appendix.

After carrying out seasonal adjustment and applying the national calendar, we find that seasonality tests have a major impact on original time series. Seasonal adjustment allows setting seasonal patterns aside in order to obtain more stable and comparable time series data. It is much easier to provide a detailed and illustrative analysis of cross-country IIP dynamics when using time series clean of seasonality effects.

The third figure presents data on seasonally adjusted time series including calendar effects. Compared to Figure 2, the curve has changed – it is now free of those extreme peak values that are typical for original index series and it is shaped more like a plane curve illustrating a realistic picture of trends in manufacturing.

The seasonally adjusted curve reached its peak values in May 2018 (127.21 per cent) and in February 2019 (128.13 per cent). Major growth slowdowns were recorded in October 2013 (113.42 per cent), July 2015 (115.13 per cent) and February 2017 (120.34 per cent). The IIP figures' overall trend is upward.

Analysing the results before and after seasonal adjustment and removing the national patterns, the figures reveal the biggest difference in the months with the highest productivity, namely those with peak values. In Table 1, Column V denotes the discrepancy between the original time series and those that have been seasonally adjusted, including calendar effects. The biggest difference between the figures is coloured in grey.

Table 1 shows that seasonal adjustment mostly affects the time series in the spring months, resulting in an upward trend, while a downward trend is visible in the autumn months, which is continuous. The seasonal adjustment revised the values upward for March 2019 from 118.82 per cent to 126.93 per cent with a difference of 8.11 per cent, for February 2017 from 111.94 per cent to 120.34 per cent with a difference of 8.4 per cent, and for May 2015 from 107.44 per cent to 115.5 per cent with a difference of 8.06 per cent. The highest discrepancy in terms of a downward revision of values was registered in November 2016, namely by 11.51 per cent, i.e. from 134.71 per cent to 123.2 per cent, in October 2018 by 10.73 per cent, from 137.09 per cent to 126.36 per cent, and in October 2017 by



10.23 per cent, from 133.49 per cent to 123.26 per cent. Other major revisions are presented in Table 1.

The analysis at the 2-digit level shows that seasonal adjustments affect time series at varying degrees, depending on industry. The industries that are least affected by seasonal adjustments are coke and refined petroleum products (ISIC Division 19), chemicals and chemical products (ISIC Division 20), and basic metals (ISIC Division 24). These industries account for the lion's share of Russian manufacturing value added (MVA), demonstrating the most stable dynamics in term of production and no major fluctuations, i.e. there are no periods of sharp rises or declines.

The effects of seasonal adjustment are visible when we analyse trend dynamics. From the list of industries least affected by seasonal adjustment, changes in ISIC Division 19 (coke and refined petroleum products) seem to be the smoothest – a seasonal adjustment revised the value for December to approximately +6 per cent compared with the original series (from 109.61 per cent to 115.75 per cent for December 2018 with an increase of 6.15 per cent) while it decreased the value for January by approximately -6.5 per cent compared with the original series (from 125.36 per cent to 118.7 per cent in January 2019, with a decline of 6.66 per cent). For the second least affected industry—ISIC Division 20 (chemicals and chemical products)—the trend dynamics show the highest decrease in November (the biggest difference was registered in November 2016, with the value being revised from 161.91 per cent to 153.19 per cent, with a decrease of 8.72 per cent) and the highest increase in January (the biggest difference was registered in January 2018, with the value being revised from 144.13 per cent to 153.06 per cent, with an increase of 6.66 per cent).

Overall, the highest average difference between the original and the seasonally adjusted data falls at the end (November, December) and beginning (January) of the year. This can partly be explained by the seasonal pattern, i.e. the number of holidays in that period and partly by the specificities in the given industry. Usually, if there is a significant rise or slowdown in production, seasonal adjustment levels the dynamics.

The most significant modifications of index figures due to seasonal adjustment are found in the following industries – motor vehicles, trailers and semi-trailers (ISIC Division 29), beverages (ISIC Division 11), pharmaceuticals, medicinal chemical and botanical products (ISIC Division 21), and repair and installation of machinery and equipment (ISIC Division 33). These industries, which are characterized by ongoing periods of slowdown and upsurges, are subject to greater seasonal fluctuations.

The biggest difference in values after applying seasonal adjustment is evident in pharmaceuticals, medicinal chemical and botanical products – seasonal adjustment revises the figure for December by approximately +40 per cent from the original series (from 159.61 per cent to 203.09 per cent in December 2018, with an increase of 51.13 per cent) while the figure dropped in May to approximately -36 per cent (from 237.47 per cent to 196.49 per cent in May 2018, with a decrease of 40.98 per cent). For the second most affected industry—motor vehicles, trailers and semi-trailers—the trend dynamics show a decrease in December (the biggest difference is observed in December 2018 – the figure was revised from 165.37 per cent to 128.13 per cent, with a decrease of 37.24 per cent) and a rise in January and July (the figure was revised from 89.62 per cent to 122.33 per cent in July 2018, with an increase of 32.71 per cent).

These fluctuations in time series are subject to the same explanation. On the one hand, a decrease in production at the end of the year is attributable to the winter holidays in Russia while periods of increases in production mostly occur in summer, and are due to the general rise in economic activity during that period. On the other hand, fluctuations may be caused by the specificities of Russia's manufacturing sector. Despite the reasons for these changes, the time series' trend after applying seasonal adjustment becomes clearer, thus allowing for a more effective analysis of index dynamics based on more reliable economic data.

Seasonal adjustment generally allows moderating the disproportionate index figures to present smoother data completely free from any economic outliers and acute fluctuations. In all of the above-mentioned revisions, as well as those presented in the Annex (Figures 6-29), the seasonality tests are designed to present the most accurate statistical data. Seasonal adjustment is an essential tool for ascertaining the real economic trend behind those peak and lowest index values.

Seasonal adjustment may be difficult for a few manufacturing industries due to the short period of the time series under observation. Tobacco products (ISIC Division 12) are mostly affected in this regard. The problem lies in the fact that a variety of highly disproportionate index figures of this particular industry in a short period does not allow the programme to build realistic time series. An abundance of outliers, mostly additive ones<sup>3</sup>, lead to seasonally adjusted time series being a straight continuous line, and that can in no way be considered a real economic situation (Figure 8). One way of resolving this problem is to consider longer time series. When using longer time series, the

---

<sup>3</sup> An **additive outlier** appears as a surprisingly large or small value occurring for a single observation.

programme will automatically recognize trend dynamics and provide a realistic seasonal adjustment free from economic outliers.

Seasonal adjustment is an integral part of compiling international comparisons of industrial production. As this analysis demonstrates, seasonally adjusted time series of the Russian Federation reflect a much more realistic economic situation of the country's manufacturing sector, and the figures, in line with the methodology of seasonal adjustment, can now be easily compared with the time series of other countries.

Summing up, seasonally adjusted data help uncover real monthly changes, short- and long-term patterns of growth or declines and turning points. Unadjusted data can be misleading when used to measure these types of underlying changes because of calendar-related effects.

Another instrument that can be used to increase data reliability is associated with calendar effects. It will be addressed in the next section.

## **1.2 Calendar effects**

A calendar effect in international practice means any market anomaly, deviations in the time series, or economic effects that appear to be related to the calendar, such as the day of the week, time of the month, time of the year, etc. In the present research, calendar effects represent a reliance of industrial production in section C (manufacturing) on the national calendar of the Russian Federation in the form of time series dynamics – growths and slowdowns of IIP.

Calendar effects are movements in time series caused by different numbers of weekdays in calendar months. They appear as the number of occurrences of each day of the week in a month differs from year to year. These differences cause regular effects in some time series. In particular, such variation caused by the leap year effect due to the additional day in February every four years. As with seasonal adjustment, a time series' calendar effects must also be estimated.

Calendar effects can be divided into a mean effect, a seasonal and a structural component. The mean effect<sup>4</sup> is independent from the period and should therefore be allocated to the trend cycle. The seasonal component arises from the properties of the calendar that recur each year. For one, the number of working days in a month with 31 calendar days is on average larger than that of months with 30 calendar days. This effect is part of the seasonal pattern captured by the seasonal component

---

<sup>4</sup> Mean effect expresses the mean difference between two groups in standard deviation units.

(with the exception of the leap year effect). The structural component of the calendar effect is determined by calendar adjustment. For example, the number of working days of the same month in different years varies from year to year. This approach is in line with the ESS Guidelines on Seasonal Adjustment (2015).

The calendars of JDemetra+ correspond to the standard trading days contrasting variables based on the Gregorian calendar, modified to take some specific holidays into account. Those holidays are considered “Sundays” and the variables are properly adjusted to account for the long-term mean effects.

The Federal State Statistics Service of Russia (Rosstat) composes calendars on a regular basis, adding years subsequently. The calendar effects of the Russian Federation can be divided into two categories introducing year-to-year variation in seasonal movements. The first category entails trading day effects resulting from differences in the number of days in the month across months and the number of times each day of the week occurs in the month over the years. Trading day effects do not affect all time series, because they tend to influence time series with significant variations in activity by day of the week.

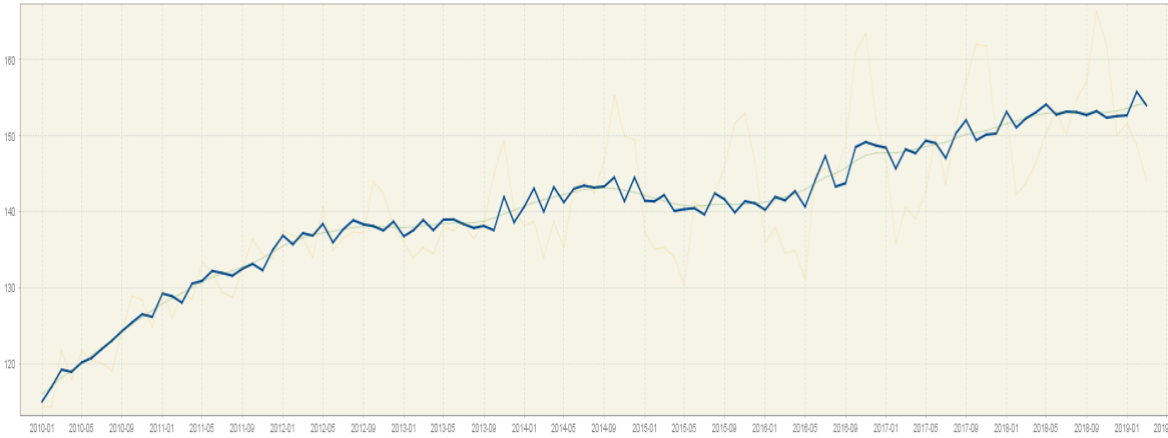
The second category entails trading day effects resulting from holidays that occur on different days of the month (Labour Day, for instance) and from holidays that move between months across the years. Holidays generate holiday-related activity, such as an increase in production or retail sales, before and/or after the holiday itself.

When a holiday falls close to the beginning of the end of the month, holiday-related activity may occur in the month before or in the month after the actual month with the holiday. This may introduce non-seasonal movement into the time series.

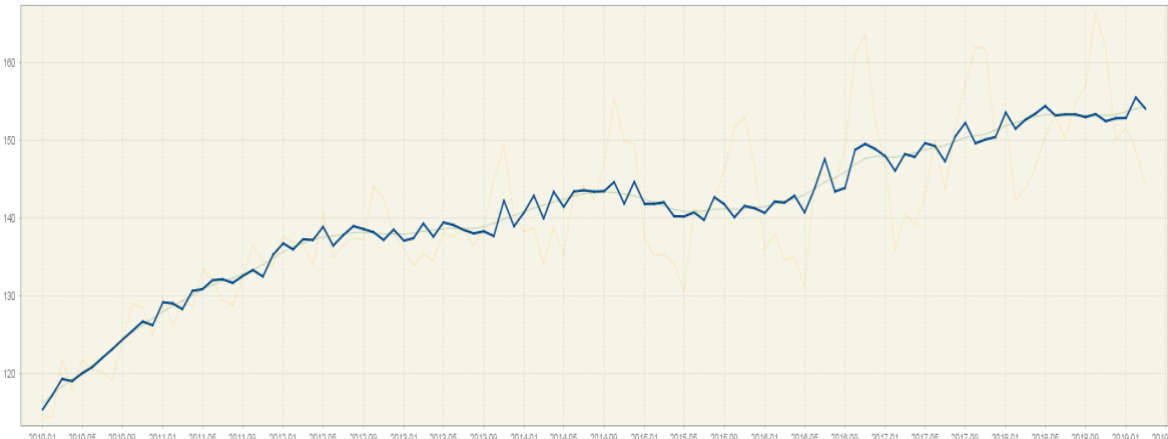
In some cases, there may be no effect. This occurs when the holiday-related activity does not carry over into the month before or after the holiday month, or when the holiday-related activity that carries over is not large enough to significantly change the expected amount of activity for that month.

The figures below illustrate the effect of the applying national calendar to the time series of Russia’s manufacturing sector from 2010 to 2019.

**Figure 4: Seasonally adjusted time series without calendar effects**



**Figure 5: Seasonally adjusted time series including calendar effects**



Column IV in Table 1 presents the absolute difference between seasonally adjusted figures and seasonally adjusted figures including calendar effects. According to the table and figures above, applying the calendar effects influences the time series, but not sufficiently to change the time series’ actual trend. The biggest differences between figures with and without calendar effects are marked in grey in Table 1.

The manufacturing total, including the maximum discrepancy between seasonally adjusted indices before and after applying the national calendar, amounts to 0.43 per cent in January 2017, with an average of only 0.06 per cent. The highest level of discrepancy is observed in those months during which longer holidays usually take place, namely January and May, and varies from 0.02 per cent in January 2014 to 0.43 per cent in January 2017. Other months with high levels of discrepancy include

February, March, June and November. There is at least one extra holiday per year in all of these months.

A closer inspection of 2-digit level shows that calendar effects have an impact on time series; however, depending on industry, some series are affected more than others.

The industries least affected by calendar effects are other non-metallic mineral products (ISIC Division 23), fabricated metal products, except machinery and equipment (ISIC Division 25), and textiles (ISIC Division 13). The lowest change in index figures when applying the national calendar of Russia occurred in other non-metallic mineral products – the revision of the index accounts for less than 1 per cent change for the entire period of analysis. The highest deviation was observed in January (the figure was revised from 122.02 per cent to 121.19 per cent, a decline of 0.84 per cent in January 2017 due to national calendar effects), when winter holidays take place and overall economic activity tends to be lower. In fabricated metal products, except machinery and equipment, calendar effects have the highest impact in the first half of the year (the highest deviation is observed in March 2016 – the index figure is revised from 156.8 per cent to 157.96 per cent, with an increase of 1.17 per cent compared to the seasonally adjusted time series).

The industries impacted the most by calendar effects are leather and related products (ISIC Division 15), furniture (ISIC Division 31), and computer, electronic and optical products (ISIC Division 26). The impact of calendar effects is highest on leather and related products, with divergences primarily observed in September (the highest discrepancy between the figures before and after applying the national calendar is registered in September 2015. The figure is revised from 97.62 per cent to 101.58 per cent, the difference being nearly 4 per cent). In computer, electronic and optical products, the difference is lower, with the highest discrepancy observed in May 2013 (the figure is revised from 97.33 per cent to 100.18 per cent, the difference amounting to 2.85 per cent). However, when analysing the trend dynamics, we find that the national calendar effects mostly affect the winter months (i.e. January, February) for this industry, which is due to the long holidays in those months.

As the tables in the appendix (Tables 2-11) indicate, calendar effects have a varying impact on the time series under observation. This can partly be estimated and explained by the specificities of Russia's manufacturing sector and Russian economics. The results clearly show that applying the national calendar to seasonally adjusted time series to some manufacturing industries has very minor effects, which means there is low correlation between the level of industrial production in those industries and the number of holidays and non-working days in a month.

Summing up, it must be mentioned that even in cases of hardly noticeable impacts when applying the national calendar, calendar effects provide more reliable and realistic time series data. Subject to availability, the national calendars of different countries must be considered to produce more efficient cross-country comparisons and analyses of a much higher quality.

## **2. Results and recommendations**

Firstly, it is clear that seasonal adjustment has a significant impact on the original time series of the Russian Federation. Year-over-year comparisons become more accurate and realistic when we use seasonally adjusted data because seasonal adjustment controls for calendar effects and data outliers. As seasonal adjustment removes seasonal effects, data can be directly compared across months and years. Such a comparison can, however, be misleading with unadjusted data. Seasonal movements in unadjusted data make it difficult to see trends within the time series. Seasonal adjustment provides a more nuanced picture of the data than year-over-year comparisons.

In times of an abundance of economic data and various indicators, it is crucial to rely on the most precise and authentic statistical data provided by seasonal adjustment, especially for industrial production indices. Seasonal adjustment is a perfect measure for analysing the specificities of national manufacturing, even if these are not visible at first glance, and to recognize trends in current manufacturing dynamics, a country's economic situation in retrospect or even its current perspective.

Secondly, according to the present research, the impact of applying the national calendar to the seasonally adjusted time series of the Russian Federation is ambiguous, i.e. the calendar effects vary from significant to virtually not visible. It is indisputable that calendar effects have a higher impact on the time series of those months with long holidays, i.e. January, February and May. On average, calendar effects account for a difference of 0 to 2 per cent from the seasonally adjusted series. However, even the slightest change in the results provides more realistic and accurate statistical data. That is why the significance of the national calendar should not be neglected or underestimated.

During the analysis, a problem of transition from ISIC Rev. 3 to Rev. 4 emerged. Rosstat only switched to ISIC Rev. 3<sup>5</sup> in 2017, and that is why the data on the website is only provided retroactively starting in 2013, and unfortunately not earlier. Consequently, some industries, including tobacco products (ISIC Division 12), are included in other divisions, because there is no unambiguous

---

<sup>5</sup> Rosstat uses the classification OKVED 2 (compiled in full compliance with ISIC Rev.4) since 2017.

transition between two versions of classifications (for instance, Division 12 was included in 10 –food products).

Furthermore, using longer time series significantly increases the quality of analysis, as it allows building more precise seasonally adjusted time series and to recognize clearer economic trends. This can only be complicated by the unavailability of statistical data to implement such an analysis.

To avoid these problems in the future, it is recommended to conduct a similar analysis of other countries' manufacturing sectors. The objective of this work was to determine whether applying seasonal adjustment and the national calendar to the time series of a country provide completely different results – more significant deviations between the original and seasonally adjusted data or a higher visibility of calendar effects.

The most important question lies in the availability of national calendars to conduct further analyses. It is known that a number of countries use national calendars specifically designed within JDemetra + for their internal purposes. However, these calendars are not published on NSOs' homepages. The procedure of obtaining national calendars is subject to further discussion and building a dialog with those responsible for designing national calendars in statistical offices.

### **3. Methodological aspects**

The methodology involved all sources of information as well as computer software used to analyse the effects of applying seasonal adjustment and the national calendar to time series of Russia's manufacturing sector (ISIC Section C).

Computer software:

- JDemetra + (ver.2.2.2)
- Microsoft Excel (ver.2016)

Guidelines:

- ESS guidelines on seasonal adjustment, Eurostat (European Union, 2015)
- World Manufacturing Production. Methodology of the Quarterly Report, UNIDO (Vienna, 2017)
- Working paper: Seasonal adjustment of national indices of industrial production at international level, UNIDO (Vienna, 2015)
- JDemetra User Guide, Narodowy Bank Polski (Warsaw, 2015)



- JDemetra Reference Manual Version 2.1, Narodowy Bank Polski (Warsaw, 2016)

Data sources:

- Federal State Statistics Service of Russian Federation website ([www.gks.ru](http://www.gks.ru))
- UNIDO Statistics Data Portal (<https://stat.unido.org>)

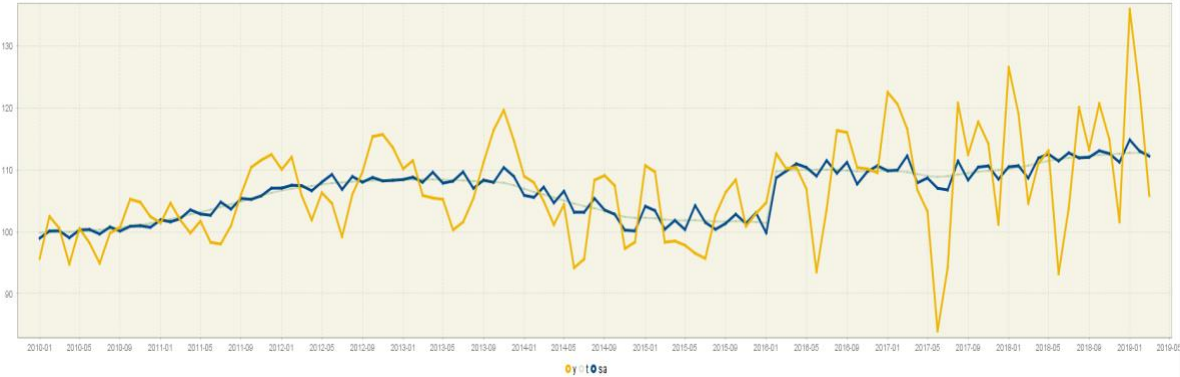
**Appendix**

The figures show the original and seasonally adjusted data for Russia’s manufacturing sector of ISIC on a 2-digit level (10-33)

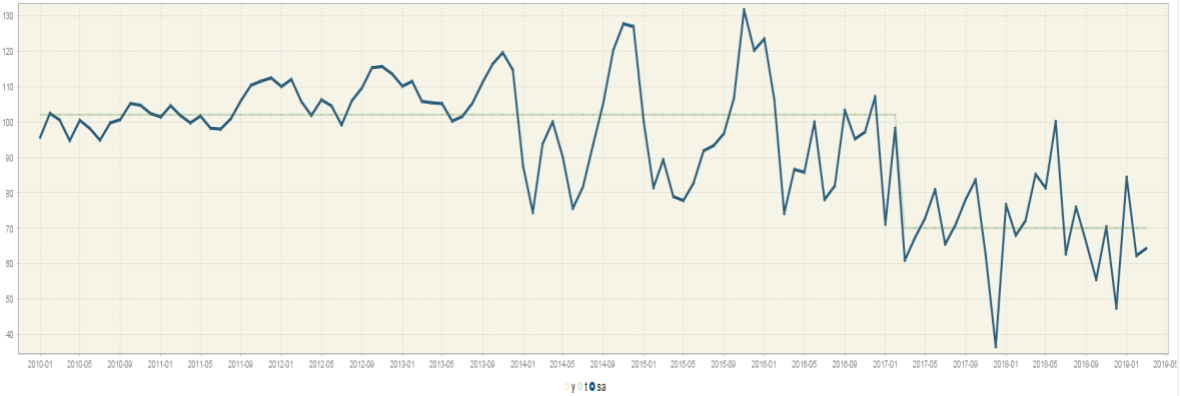
**Figure 6: ISIC 10 (Food products)**



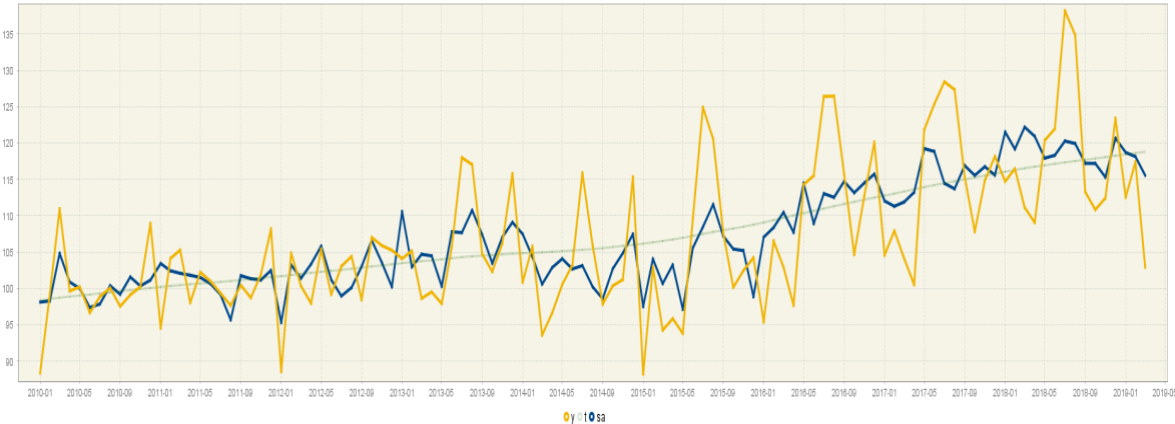
**Figure 7: ISIC 11 (Beverages)**



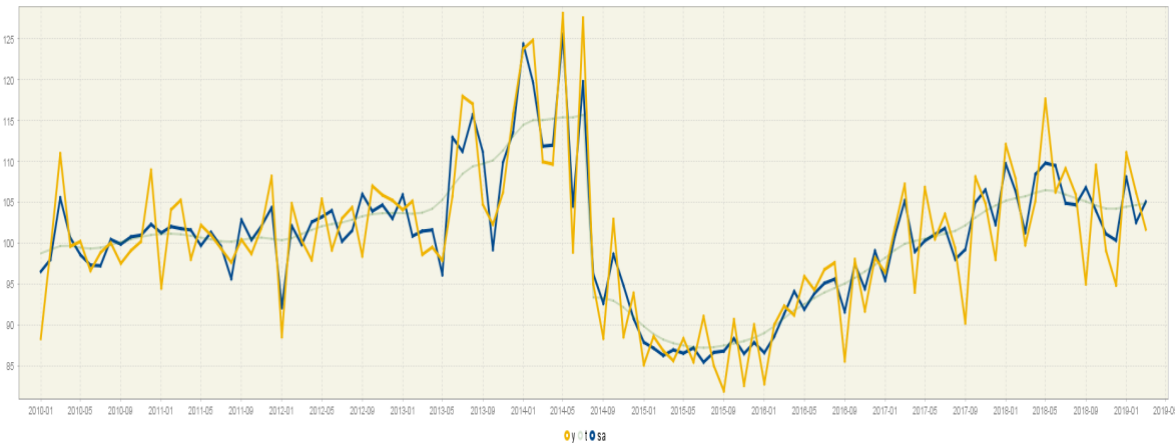
**Figure 8: ISIC 12 (Tobacco products)**



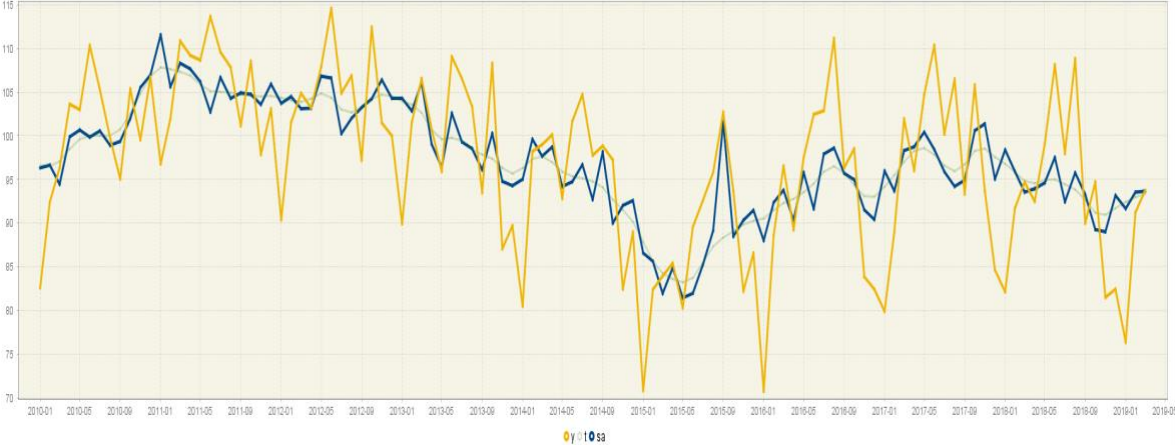
**Figure 9: ISIC 13 (Textiles)**



**Figure 10: ISIC 14 (Wearing apparel)**



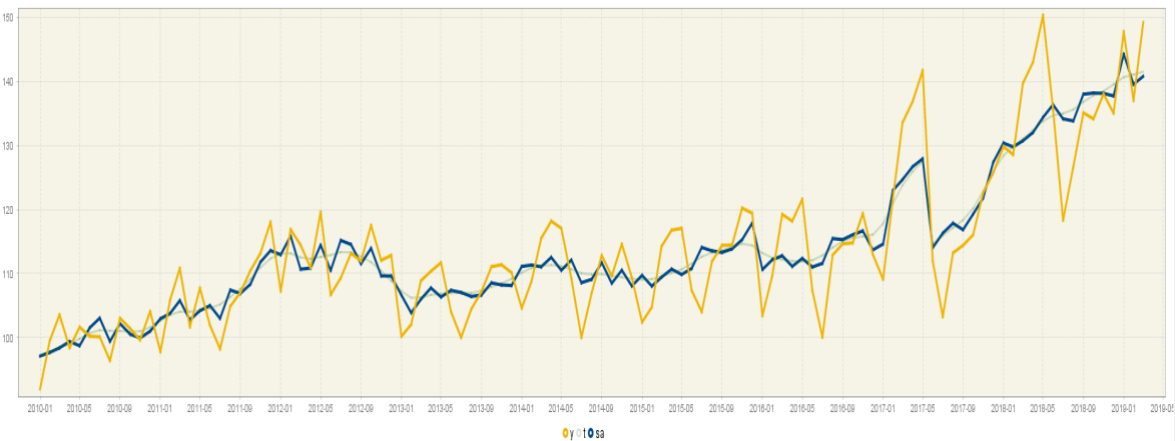
**Figure 11: ISIC 15 (Leather and related products)**



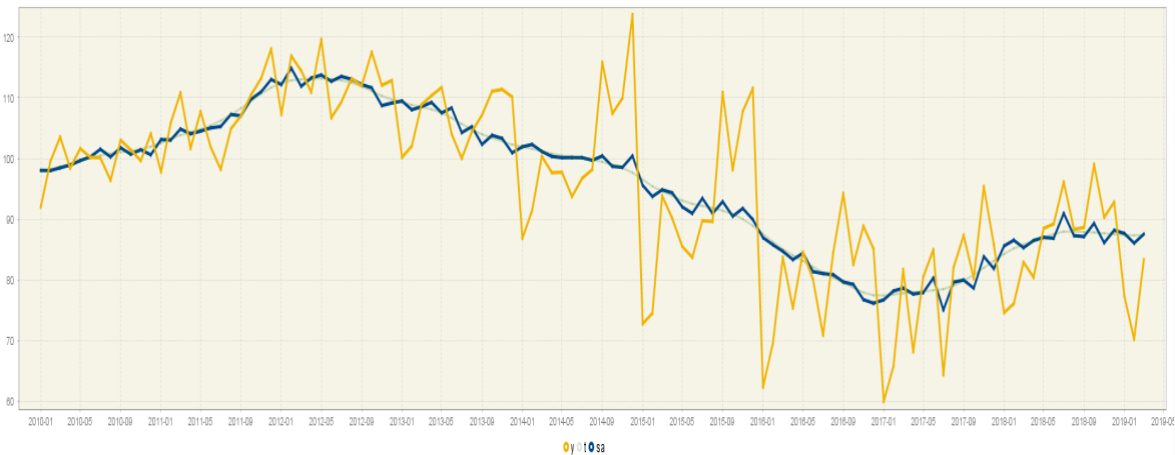
**Figure 12: ISIC 16 (Wood and products of wood and cork, except furniture; articles of straw and plaiting materials)**



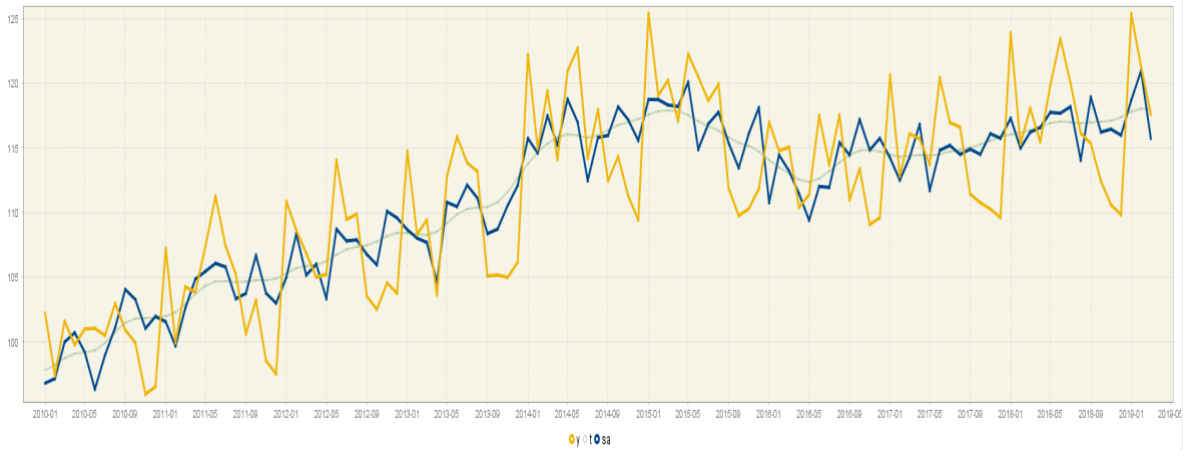
**Figure 13: ISIC 17 (Paper and paper products)**



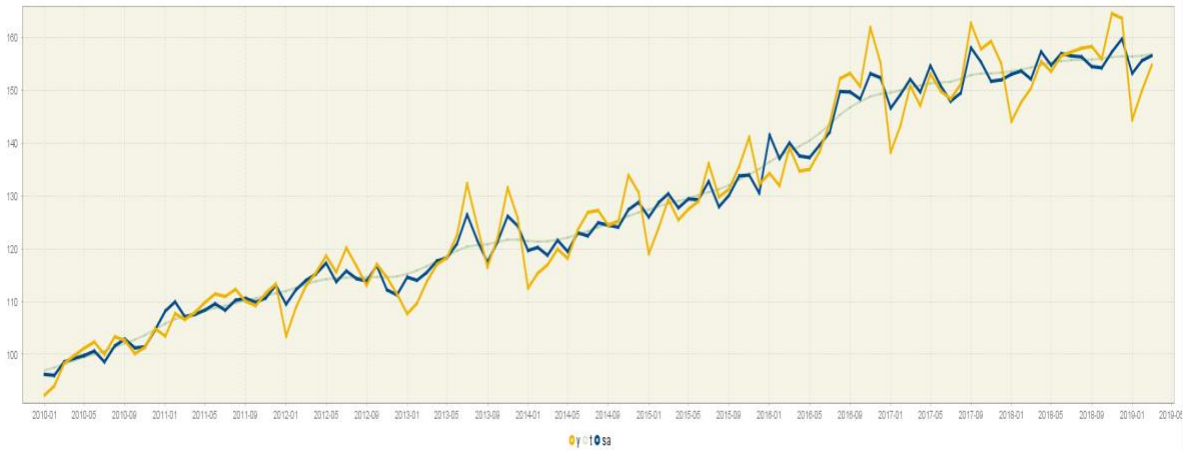
**Figure 14: ISIC 18 (Printing and reproduction of recorded media)**



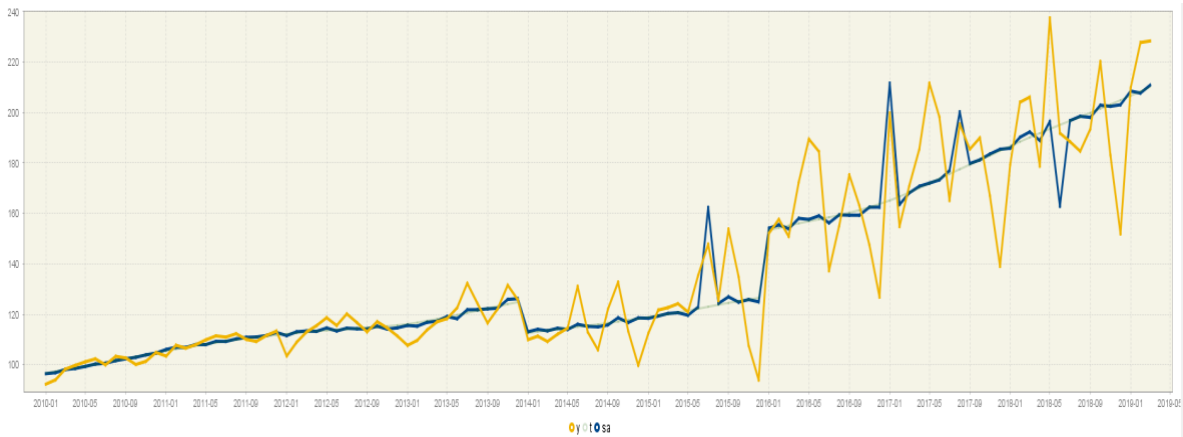
**Figure 15: ISIC 19 (Coke and refined petroleum products)**



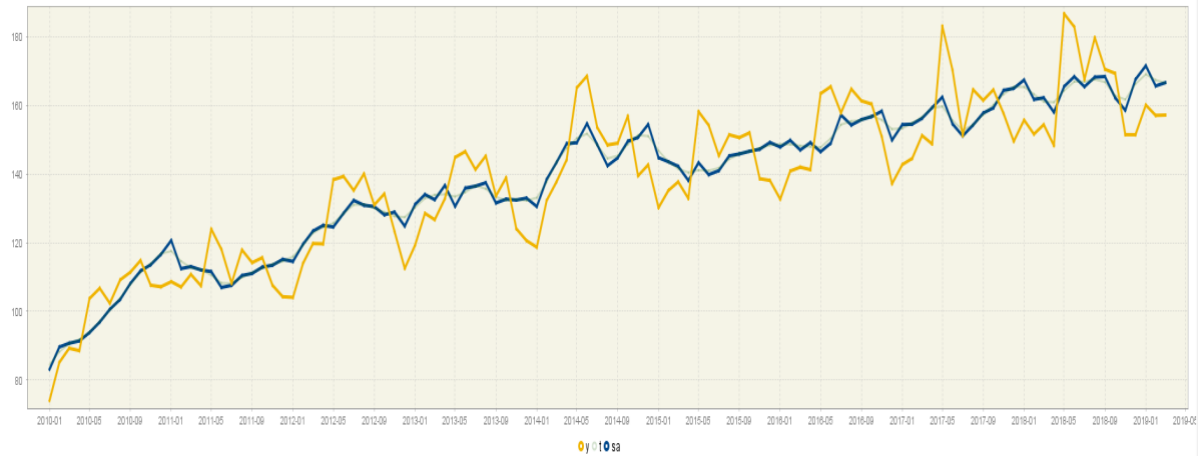
**Figure 16: ISIC 20 (Chemicals and chemical products)**



**Figure 17: ISIC 21 (Pharmaceuticals, medicinal chemical and botanical products)**



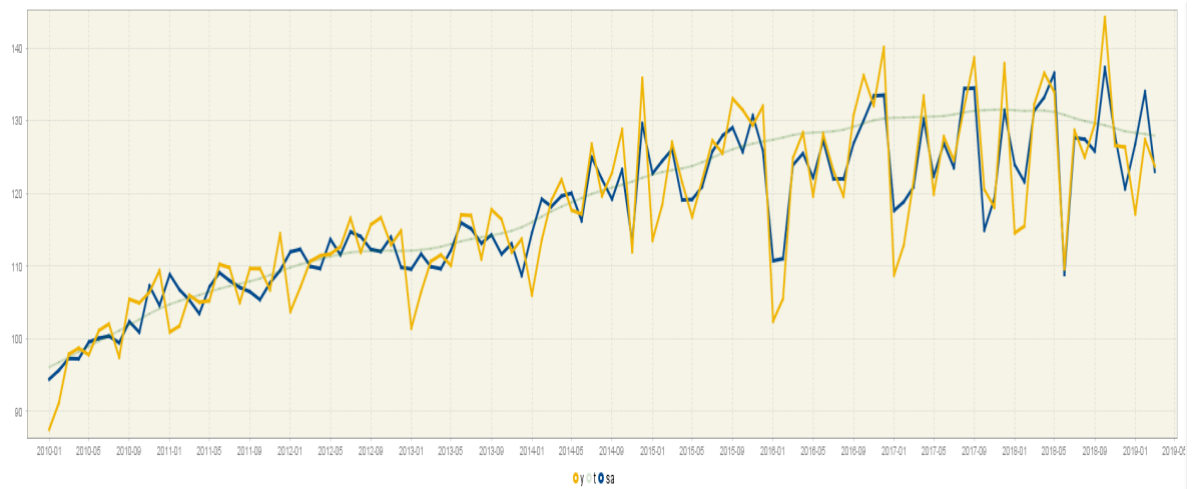
**Figure 18: ISIC 22 (Rubber and plastics products)**



**Figure 19: ISIC 23 (Other non-metallic mineral products)**

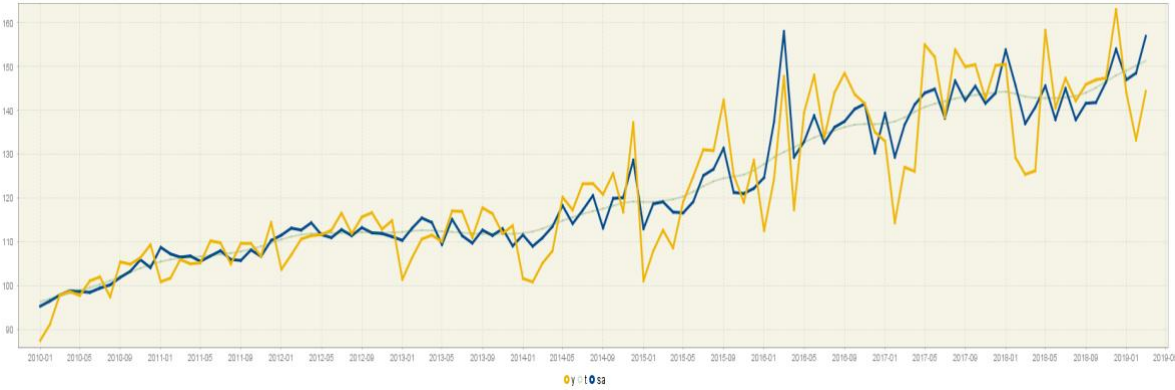


**Figure 20: ISIC 24 (Basic metals)**

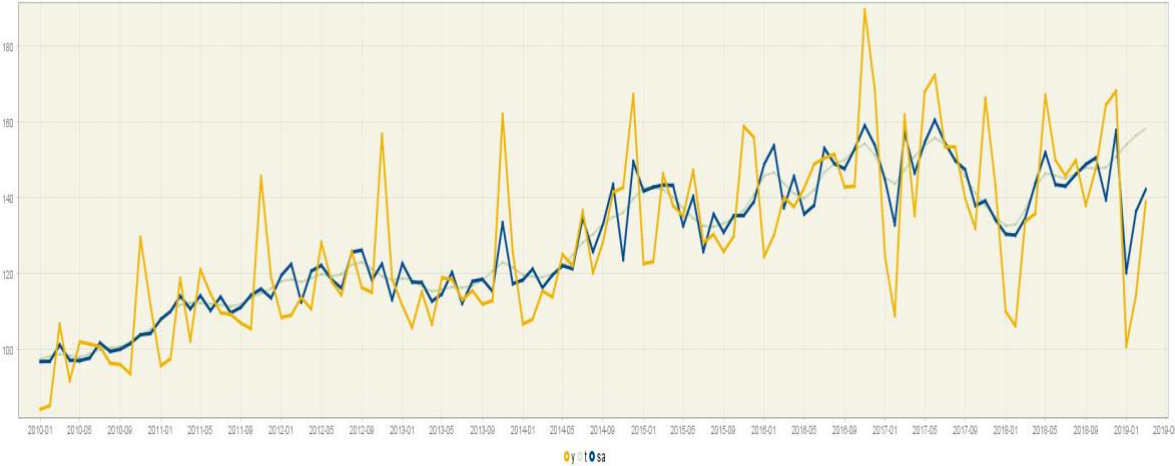




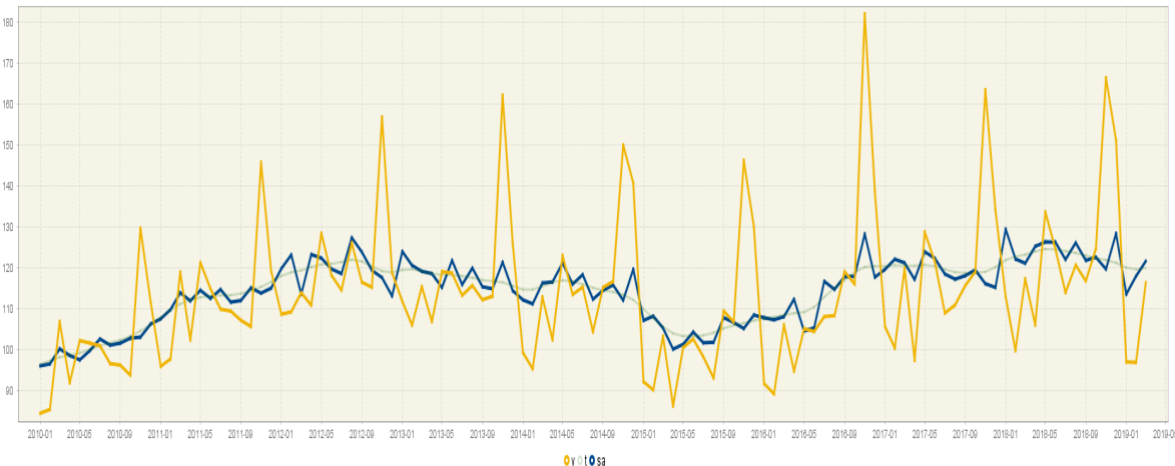
**Figure 21: ISIC 25 (Fabricated metal products, except machinery and equipment)**



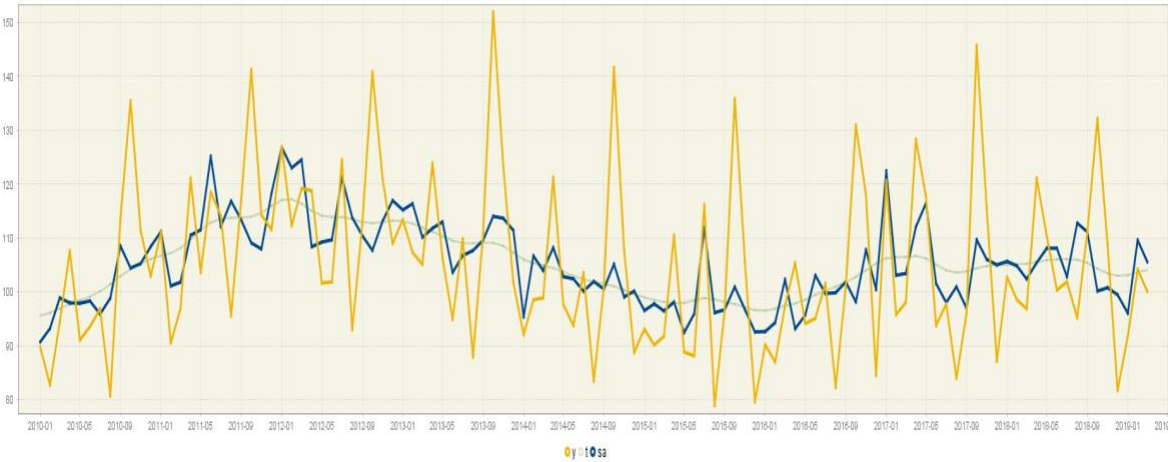
**Figure 22: ISIC 26 (Computer, electronic and optical products)**



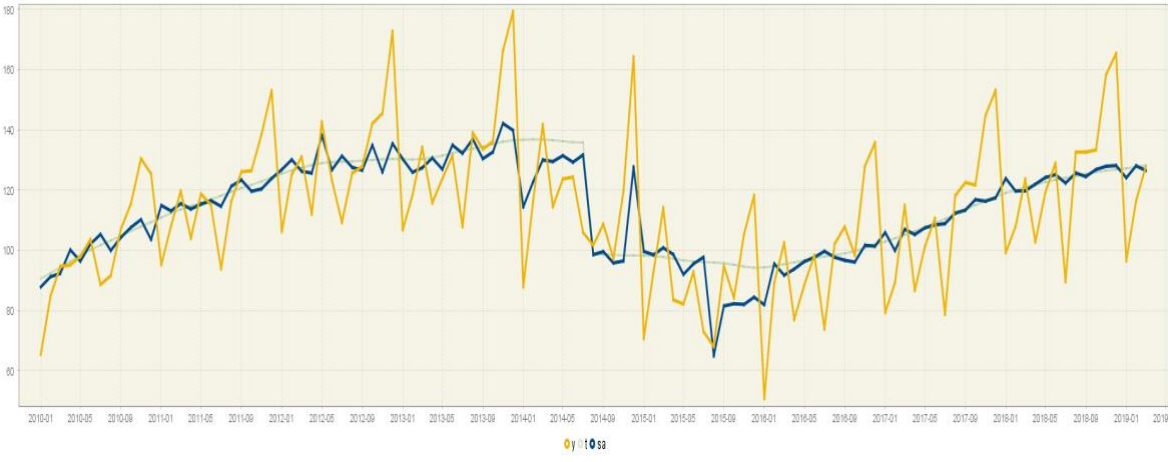
**Figure 23: ISIC 27 (Electrical equipment)**



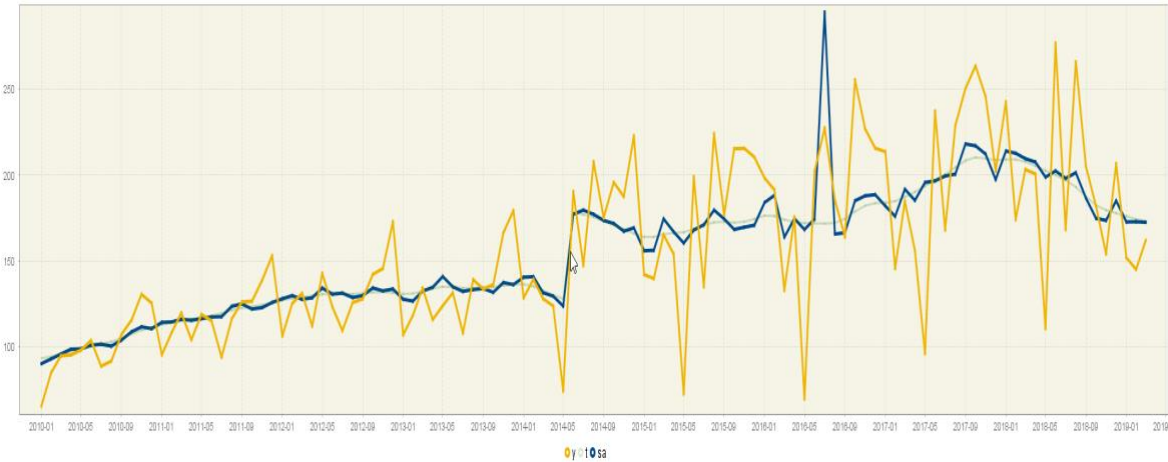
**Figure 24: ISIC 28 (Machinery and equipment n.e.c.)**



**Figure 25: ISIC 29 (Motor vehicles, trailers and semi-trailers)**

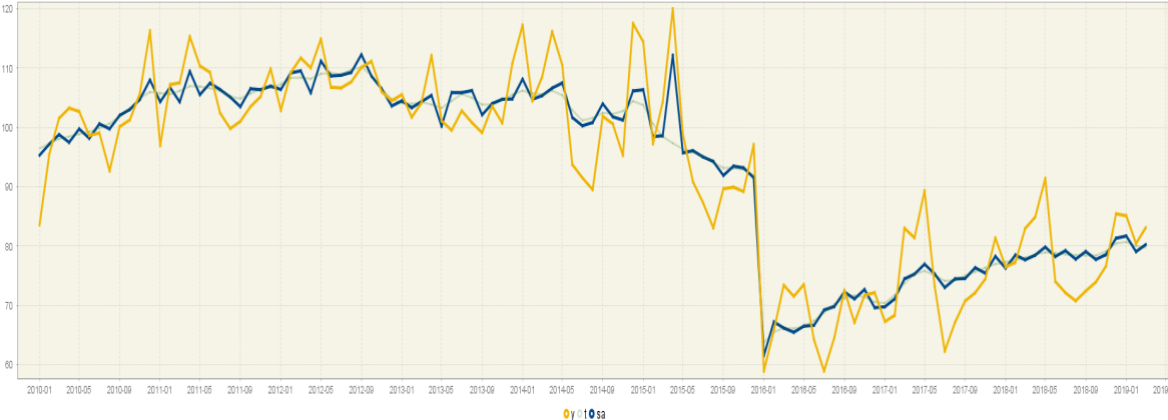


**Figure 26: ISIC 30 (Other transport equipment)**





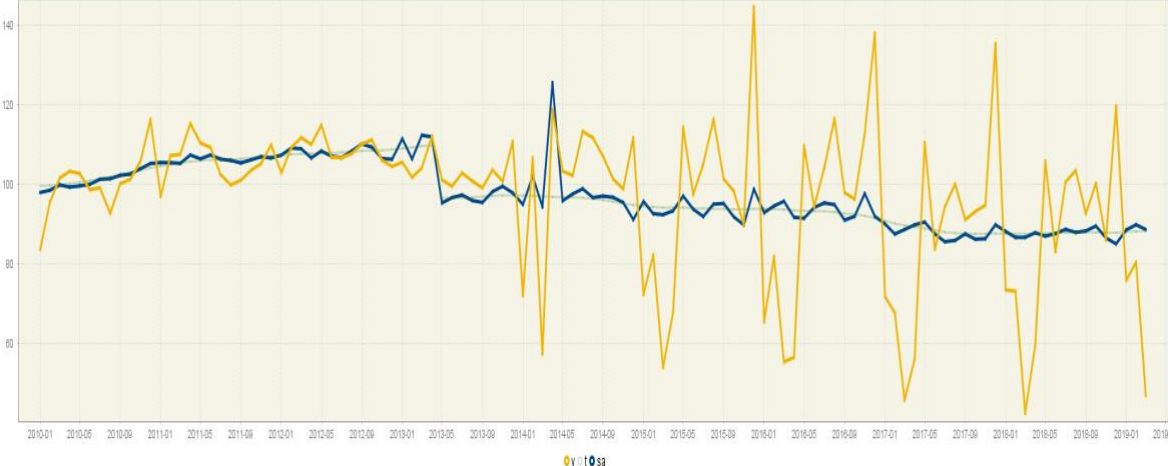
**Figure 27: ISIC 31 (Furniture)**



**Figure 28: ISIC 32 (Other manufacturing)**



**Figure 29: ISIC 33 (Repair and installation of machinery and equipment)**



The tables reflect the impact of seasonal adjustment and calendar effects on time series of Russia's manufacturing sector at the 2-digit level. The biggest deviations from the original time series are marked in grey.

**Table 2: ISIC13**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	88.38	98.14	97.93	0.21	9.76
2/1/2010	99.27	98.31	98.01	0.30	-0.96
3/1/2010	110.95	104.84	104.54	0.30	-6.12
4/1/2010	99.66	100.90	100.72	0.19	1.24
5/1/2010	100.24	100.01	101.38	-1.37	-0.22
6/1/2010	96.67	97.39	97.83	-0.43	0.73
7/1/2010	98.88	97.88	98.00	-0.12	-1.00
8/1/2010	100.08	100.40	100.57	-0.18	0.32
9/1/2010	97.55	99.21	99.00	0.22	1.66
10/1/2010	99.13	101.59	101.39	0.20	2.46
11/1/2010	100.24	100.35	99.69	0.66	0.11
12/1/2010	108.95	101.17	100.73	0.45	-7.78
1/1/2011	94.57	103.45	104.29	-0.85	8.88
2/1/2011	104.13	102.44	102.27	0.17	-1.69
3/1/2011	105.30	102.10	101.26	0.84	-3.20
4/1/2011	98.07	101.83	101.87	-0.04	3.76
5/1/2011	102.24	101.52	101.91	-0.38	-0.72
6/1/2011	101.02	100.68	101.22	-0.53	-0.34
7/1/2011	99.37	99.20	99.51	-0.31	-0.18
8/1/2011	97.68	95.70	95.68	0.02	-1.98
9/1/2011	100.48	101.77	101.48	0.29	1.29

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
10/1/2011	98.73	101.35	101.21	0.14	2.62
11/1/2011	101.94	101.18	100.80	0.39	-0.76
12/1/2011	108.19	102.50	102.09	0.41	-5.69
1/1/2012	88.61	95.34	95.92	-0.57	6.73
2/1/2012	104.86	103.25	102.58	0.67	-1.61
3/1/2012	100.35	101.41	101.20	0.22	1.06
4/1/2012	97.97	103.37	102.90	0.47	5.40
5/1/2012	105.41	105.84	104.42	1.42	0.43
6/1/2012	99.20	101.21	100.38	0.83	2.02
7/1/2012	103.05	98.97	99.02	-0.05	-4.08
8/1/2012	104.42	100.14	99.96	0.18	-4.28
9/1/2012	98.47	103.04	103.15	-0.11	4.57
10/1/2012	107.03	106.64	106.12	0.52	-0.39
11/1/2012	105.92	103.59	104.28	-0.69	-2.33
12/1/2012	105.27	100.24	101.24	-1.00	-5.02
1/1/2013	104.12	110.57	109.70	0.87	6.45
2/1/2013	105.18	102.97	103.92	-0.95	-2.21
3/1/2013	98.64	104.71	104.53	0.18	6.07
4/1/2013	99.54	104.50	104.41	0.09	4.96
5/1/2013	97.93	100.30	98.96	1.35	2.38
6/1/2013	105.75	107.81	107.85	-0.04	2.06
7/1/2013	117.99	107.69	107.35	0.34	-10.30
8/1/2013	117.05	110.77	110.54	0.22	-6.29
9/1/2013	104.77	107.41	107.31	0.10	2.64
10/1/2013	102.32	103.47	103.14	0.33	1.15

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
11/1/2013	106.24	107.06	106.65	0.41	0.83
12/1/2013	115.79	109.11	108.58	0.53	-6.68
1/1/2014	100.89	107.50	106.91	0.59	6.61
2/1/2014	105.81	104.37	105.27	-0.90	-1.44
3/1/2014	93.61	100.60	101.54	-0.94	6.99
4/1/2014	96.65	102.89	102.70	0.19	6.24
5/1/2014	100.57	104.09	103.84	0.26	3.52
6/1/2014	103.21	102.70	101.93	0.76	-0.51
7/1/2014	115.87	103.15	102.67	0.48	-12.72
8/1/2014	105.93	100.25	100.09	0.15	-5.68
9/1/2014	97.86	98.59	98.29	0.30	0.73
10/1/2014	100.37	102.72	102.36	0.36	2.35
11/1/2014	101.24	104.88	104.16	0.71	3.64
12/1/2014	115.33	107.49	106.91	0.58	-7.84
1/1/2015	88.28	97.54	96.85	0.69	9.26
2/1/2015	102.95	104.08	103.42	0.65	1.13
3/1/2015	94.27	100.68	101.45	-0.78	6.41
4/1/2015	95.88	103.26	102.97	0.29	7.39
5/1/2015	93.83	97.17	98.09	-0.91	3.34
6/1/2015	109.61	105.59	104.97	0.62	-4.02
7/1/2015	124.91	108.48	107.78	0.70	-16.43
8/1/2015	120.55	111.57	111.30	0.27	-8.98
9/1/2015	107.64	107.22	106.79	0.43	-0.42
10/1/2015	100.17	105.44	105.26	0.17	5.26
11/1/2015	102.46	105.21	104.83	0.38	2.75

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
12/1/2015	104.26	98.89	98.60	0.29	-5.37
1/1/2016	95.43	107.06	106.92	0.13	11.63
2/1/2016	106.55	108.39	107.49	0.90	1.84
3/1/2016	102.94	110.49	109.46	1.03	7.55
4/1/2016	97.70	107.72	107.66	0.06	10.02
5/1/2016	114.29	114.48	114.52	-0.04	0.19
6/1/2016	115.53	108.93	109.62	-0.69	-6.60
7/1/2016	126.41	113.05	112.81	0.24	-13.36
8/1/2016	126.46	112.54	111.97	0.57	-13.92
9/1/2016	115.72	114.73	114.25	0.49	-0.98
10/1/2016	104.68	113.17	113.29	-0.12	8.49
11/1/2016	112.70	114.52	113.71	0.80	1.81
12/1/2016	120.11	115.74	115.64	0.10	-4.36
1/1/2017	104.59	112.04	113.45	-1.41	7.45
2/1/2017	107.94	111.31	110.52	0.79	3.37
3/1/2017	104.17	111.89	111.67	0.22	7.72
4/1/2017	100.53	113.24	113.40	-0.16	12.71
5/1/2017	121.83	119.24	118.25	0.99	-2.59
6/1/2017	125.35	118.85	118.19	0.66	-6.50
7/1/2017	128.43	114.48	114.26	0.21	-13.95
8/1/2017	127.34	113.71	113.32	0.39	-13.63
9/1/2017	115.37	116.91	116.66	0.25	1.54
10/1/2017	107.82	115.55	115.48	0.07	7.73
11/1/2017	114.85	116.76	117.23	-0.47	1.91
12/1/2017	118.18	115.59	115.73	-0.15	-2.60

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2018	114.73	121.53	120.71	0.82	6.80
2/1/2018	116.47	119.17	118.62	0.55	2.70
3/1/2018	111.15	122.20	121.67	0.53	11.05
4/1/2018	109.08	120.93	120.10	0.83	11.86
5/1/2018	120.37	117.92	117.08	0.84	-2.45
6/1/2018	121.96	118.32	117.47	0.86	-3.64
7/1/2018	138.19	120.28	119.72	0.56	-17.91
8/1/2018	134.86	119.93	119.52	0.42	-14.92
9/1/2018	113.29	117.22	117.23	-0.01	3.93
10/1/2018	110.84	117.20	116.98	0.22	6.36
11/1/2018	112.43	115.31	115.73	-0.43	2.87
12/1/2018	123.38	120.66	120.26	0.40	-2.72
1/1/2019	112.55	118.71	118.17	0.55	6.16
2/1/2019	117.40	118.13	119.40	-1.26	0.74
3/1/2019	102.93	115.56	116.00	-0.44	12.63
4/1/2019	108.23	117.53	118.39	-0.86	9.30
5/1/2019	119.48	118.48	119.36	-0.87	-1.00
6/1/2019	121.10	119.03	119.88	-0.84	-2.07
7/1/2019	139.99	119.39	120.23	-0.83	-20.59
8/1/2019	132.34	119.67	120.51	-0.84	-12.67
9/1/2019	118.10	119.91	120.77	-0.86	1.81
10/1/2019	113.73	120.13	121.03	-0.90	6.40
11/1/2019	113.55	120.34	121.28	-0.94	6.79
12/1/2019	126.54	120.55	121.53	-0.98	-5.99
1/1/2020	114.53	120.76	121.78	-1.02	6.23

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2020	118.08	120.97	122.03	-1.07	2.89
3/1/2020	111.27	121.18	122.29	-1.11	9.91

**Table 3: ISIC14**

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2010	88.38	96.56	95.56	1.00	8.18
2/1/2010	99.27	98.05	97.02	1.03	-1.22
3/1/2010	110.95	105.58	105.61	-0.03	-5.37
4/1/2010	99.66	100.69	100.65	0.04	1.03
5/1/2010	100.24	98.62	100.76	-2.14	-1.62
6/1/2010	96.67	97.35	97.97	-0.62	0.68
7/1/2010	98.88	97.28	96.97	0.31	-1.60
8/1/2010	100.08	100.49	100.29	0.19	0.41
9/1/2010	97.55	99.91	99.89	0.02	2.36
10/1/2010	99.13	100.81	100.66	0.14	1.67
11/1/2010	100.24	101.02	100.21	0.81	0.78
12/1/2010	108.95	102.34	102.15	0.20	-6.61
1/1/2011	94.57	101.29	101.90	-0.61	6.73
2/1/2011	104.13	102.06	101.58	0.49	-2.07
3/1/2011	105.30	101.82	101.02	0.79	-3.48
4/1/2011	98.07	101.64	101.65	-0.01	3.57
5/1/2011	102.24	99.74	100.47	-0.73	-2.51
6/1/2011	101.02	101.37	102.19	-0.82	0.36

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
7/1/2011	99.37	99.64	99.42	0.21	0.26
8/1/2011	97.68	95.70	95.43	0.26	-1.98
9/1/2011	100.48	102.90	102.87	0.03	2.42
10/1/2011	98.73	100.43	100.25	0.17	1.69
11/1/2011	101.94	102.14	101.87	0.27	0.20
12/1/2011	108.19	104.37	104.14	0.23	-3.81
1/1/2012	88.61	92.18	92.74	-0.56	3.58
2/1/2012	104.86	102.15	101.44	0.71	-2.71
3/1/2012	100.35	99.86	99.56	0.31	-0.48
4/1/2012	97.97	102.62	101.88	0.73	4.65
5/1/2012	105.41	103.24	101.28	1.96	-2.17
6/1/2012	99.20	104.02	102.75	1.28	4.83
7/1/2012	103.05	100.24	100.01	0.23	-2.81
8/1/2012	104.42	101.58	101.37	0.21	-2.83
9/1/2012	98.47	106.03	106.11	-0.08	7.56
10/1/2012	107.03	103.95	103.57	0.37	-3.08
11/1/2012	105.92	104.70	106.02	-1.32	-1.21
12/1/2012	105.27	103.03	104.47	-1.44	-2.24
1/1/2013	104.12	105.95	105.09	0.87	1.84
2/1/2013	105.18	100.90	102.36	-1.46	-4.28
3/1/2013	98.64	101.50	101.01	0.50	2.86
4/1/2013	99.54	101.65	101.42	0.23	2.12
5/1/2013	97.93	96.19	93.98	2.21	-1.74
6/1/2013	105.75	112.97	112.50	0.47	7.22
7/1/2013	117.99	111.23	110.98	0.25	-6.76



	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
8/1/2013	117.05	115.74	115.67	0.07	-1.31
9/1/2013	104.77	111.18	111.08	0.10	6.41
10/1/2013	102.32	99.27	98.88	0.38	-3.05
11/1/2013	106.24	109.90	109.46	0.44	3.66
12/1/2013	115.79	113.59	113.19	0.40	-2.20
1/1/2014	123.79	124.38	123.63	0.74	0.58
2/1/2014	124.84	119.70	121.41	-1.72	-5.15
3/1/2014	109.98	111.88	113.01	-1.12	1.90
4/1/2014	109.69	112.01	111.70	0.31	2.33
5/1/2014	128.09	125.52	124.53	0.99	-2.57
6/1/2014	98.98	104.58	103.33	1.25	5.60
7/1/2014	127.55	119.76	119.50	0.26	-7.79
8/1/2014	95.05	96.27	96.25	0.02	1.23
9/1/2014	88.43	92.67	92.41	0.26	4.24
10/1/2014	102.93	98.68	98.41	0.27	-4.25
11/1/2014	88.60	94.86	93.88	0.98	6.26
12/1/2014	93.91	90.82	90.45	0.37	-3.09
1/1/2015	85.17	87.93	86.87	1.05	2.76
2/1/2015	88.64	87.20	86.53	0.68	-1.43
3/1/2015	86.89	86.32	87.17	-0.85	-0.57
4/1/2015	85.67	86.99	86.77	0.21	1.32
5/1/2015	88.38	86.59	87.39	-0.80	-1.79
6/1/2015	85.52	87.23	86.71	0.52	1.72
7/1/2015	91.07	85.49	85.26	0.23	-5.58
8/1/2015	85.07	86.68	86.59	0.10	1.62

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
9/1/2015	81.97	86.85	86.51	0.34	4.88
10/1/2015	90.68	88.37	88.24	0.13	-2.31
11/1/2015	82.66	86.53	85.99	0.54	3.87
12/1/2015	90.06	87.90	87.53	0.36	-2.16
1/1/2016	82.87	86.65	86.16	0.49	3.78
2/1/2016	90.06	88.64	87.46	1.17	-1.42
3/1/2016	92.36	91.38	90.31	1.07	-0.98
4/1/2016	91.23	94.15	94.06	0.09	2.92
5/1/2016	95.98	91.93	92.16	-0.24	-4.06
6/1/2016	94.33	93.88	94.94	-1.06	-0.45
7/1/2016	96.81	95.14	94.99	0.15	-1.67
8/1/2016	97.66	95.64	95.32	0.32	-2.01
9/1/2016	85.66	91.64	91.19	0.45	5.98
10/1/2016	98.03	97.50	97.42	0.08	-0.53
11/1/2016	91.76	94.44	93.58	0.87	2.68
12/1/2016	98.25	99.09	98.74	0.36	0.84
1/1/2017	96.46	95.47	97.08	-1.61	-0.99
2/1/2017	101.94	100.95	99.65	1.30	-0.99
3/1/2017	107.23	105.22	104.85	0.37	-2.01
4/1/2017	94.06	98.98	99.01	-0.02	4.92
5/1/2017	106.83	100.33	99.66	0.67	-6.50
6/1/2017	100.55	101.11	100.70	0.41	0.56
7/1/2017	103.59	101.86	101.66	0.20	-1.73
8/1/2017	99.41	98.06	97.64	0.42	-1.35
9/1/2017	90.29	99.27	98.81	0.46	8.98

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
10/1/2017	108.13	105.01	104.82	0.18	-3.12
11/1/2017	104.88	106.57	107.11	-0.54	1.69
12/1/2017	98.06	102.30	101.95	0.35	4.24
1/1/2018	112.09	109.73	109.13	0.60	-2.36
2/1/2018	107.96	106.38	105.54	0.85	-1.58
3/1/2018	99.83	101.34	100.41	0.94	1.51
4/1/2018	105.16	108.43	107.73	0.70	3.27
5/1/2018	117.62	109.82	109.21	0.61	-7.80
6/1/2018	106.28	109.52	108.58	0.93	3.23
7/1/2018	109.18	104.92	104.62	0.30	-4.26
8/1/2018	105.97	104.73	104.26	0.47	-1.25
9/1/2018	95.07	106.85	106.47	0.38	11.78
10/1/2018	109.53	104.01	103.73	0.27	-5.53
11/1/2018	99.11	101.17	101.52	-0.35	2.06
12/1/2018	94.92	100.38	99.36	1.02	5.46
1/1/2019	111.08	108.11	107.67	0.44	-2.97
2/1/2019	106.23	102.55	103.93	-1.38	-3.68
3/1/2019	101.73	105.10	104.92	0.18	3.37
4/1/2019	105.16	105.12	105.22	-0.10	-0.04
5/1/2019	111.54	105.39	105.50	-0.11	-6.15
6/1/2019	100.98	105.65	105.78	-0.13	4.67
7/1/2019	112.85	105.92	106.06	-0.15	-6.94
8/1/2019	104.99	106.18	106.34	-0.16	1.19
9/1/2019	97.04	106.45	106.63	-0.18	9.41
10/1/2019	112.39	106.71	106.91	-0.20	-5.68

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
11/1/2019	100.61	106.98	107.19	-0.21	6.37
12/1/2019	104.39	107.25	107.48	-0.23	2.86
1/1/2020	110.59	107.52	107.76	-0.25	-3.07
2/1/2020	109.01	107.78	108.05	-0.26	-1.22
3/1/2020	108.88	108.05	108.34	-0.28	-0.82

**Table 4: ISIC15**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	82.57	96.32	95.48	0.84	13.75
2/1/2010	92.43	96.63	96.21	0.43	4.20
3/1/2010	96.31	94.45	94.66	-0.21	-1.87
4/1/2010	103.61	99.88	99.60	0.28	-3.74
5/1/2010	102.99	100.66	101.60	-0.95	-2.34
6/1/2010	110.35	99.85	100.24	-0.38	-10.49
7/1/2010	105.27	100.55	100.49	0.06	-4.71
8/1/2010	99.76	98.91	99.26	-0.35	-0.85
9/1/2010	95.06	99.36	99.45	-0.09	4.30
10/1/2010	105.37	101.98	102.06	-0.08	-3.39
11/1/2010	99.55	105.52	104.91	0.61	5.97
12/1/2010	106.71	106.96	106.49	0.46	0.25
1/1/2011	96.78	111.55	111.69	-0.14	14.77
2/1/2011	101.96	105.60	105.35	0.26	3.65
3/1/2011	110.86	108.31	107.76	0.55	-2.55

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
4/1/2011	109.21	107.66	107.49	0.17	-1.55
5/1/2011	108.66	106.19	106.52	-0.33	-2.46
6/1/2011	113.66	102.71	103.33	-0.63	-10.95
7/1/2011	109.58	106.69	106.68	0.01	-2.90
8/1/2011	107.84	104.28	104.58	-0.30	-3.56
9/1/2011	101.15	104.91	104.73	0.18	3.76
10/1/2011	108.53	104.75	104.72	0.03	-3.78
11/1/2011	97.86	103.58	103.32	0.26	5.72
12/1/2011	103.08	105.93	105.38	0.56	2.85
1/1/2012	90.39	103.71	104.07	-0.36	13.32
2/1/2012	101.55	104.49	103.89	0.60	2.94
3/1/2012	104.87	103.10	102.84	0.26	-1.77
4/1/2012	103.20	103.16	102.69	0.47	-0.04
5/1/2012	107.89	106.83	105.68	1.15	-1.07
6/1/2012	114.57	106.61	105.61	0.99	-7.96
7/1/2012	104.87	100.23	100.31	-0.08	-4.64
8/1/2012	106.87	102.00	102.22	-0.22	-4.87
9/1/2012	97.20	103.23	102.58	0.65	6.02
10/1/2012	112.44	104.23	104.07	0.16	-8.20
11/1/2012	101.48	106.41	107.29	-0.88	4.93
12/1/2012	99.99	104.29	105.01	-0.71	4.30
1/1/2013	89.94	104.29	103.74	0.54	14.35
2/1/2013	101.55	102.83	103.64	-0.81	1.28
3/1/2013	106.55	106.11	105.51	0.60	-0.44
4/1/2013	100.73	99.03	99.13	-0.10	-1.69

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
5/1/2013	95.92	96.41	95.48	0.92	0.49
6/1/2013	109.07	102.59	102.37	0.22	-6.48
7/1/2013	106.55	99.30	99.28	0.02	-7.25
8/1/2013	103.35	98.52	98.61	-0.09	-4.82
9/1/2013	93.51	96.11	94.76	1.35	2.60
10/1/2013	108.28	100.28	100.18	0.09	-8.00
11/1/2013	87.07	94.78	94.59	0.18	7.71
12/1/2013	89.69	94.29	94.03	0.26	4.59
1/1/2014	80.49	95.02	94.99	0.03	14.53
2/1/2014	98.20	99.61	100.46	-0.85	1.42
3/1/2014	98.98	97.66	98.29	-0.63	-1.33
4/1/2014	100.12	98.72	98.75	-0.04	-1.40
5/1/2014	92.85	94.19	94.26	-0.07	1.34
6/1/2014	101.65	94.74	94.31	0.43	-6.91
7/1/2014	104.74	96.70	96.59	0.11	-8.04
8/1/2014	97.76	92.69	92.61	0.08	-5.08
9/1/2014	98.84	98.15	95.32	2.83	-0.69
10/1/2014	97.23	89.99	89.98	0.01	-7.24
11/1/2014	82.46	92.02	91.45	0.57	9.56
12/1/2014	88.97	92.58	92.46	0.12	3.61
1/1/2015	70.83	86.58	86.36	0.22	15.74
2/1/2015	82.39	85.62	85.37	0.24	3.23
3/1/2015	83.94	81.93	82.84	-0.90	-2.01
4/1/2015	85.40	84.88	85.16	-0.28	-0.52
5/1/2015	80.31	81.44	82.45	-1.02	1.12

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
6/1/2015	89.55	81.96	82.22	-0.26	-7.59
7/1/2015	92.59	85.25	85.24	0.01	-7.34
8/1/2015	95.81	89.13	88.86	0.27	-6.68
9/1/2015	102.69	101.58	97.62	3.96	-1.11
10/1/2015	93.73	88.48	88.42	0.06	-5.25
11/1/2015	82.21	90.32	90.23	0.10	8.12
12/1/2015	86.57	91.47	91.60	-0.14	4.90
1/1/2016	70.76	88.00	88.07	-0.07	17.24
2/1/2016	88.57	92.35	91.93	0.42	3.78
3/1/2016	96.53	93.77	93.27	0.50	-2.76
4/1/2016	89.25	90.33	90.55	-0.23	1.08
5/1/2016	97.50	95.80	96.07	-0.27	-1.70
6/1/2016	102.45	91.62	92.71	-1.09	-10.83
7/1/2016	102.87	97.91	97.76	0.16	-4.95
8/1/2016	111.14	98.59	98.31	0.28	-12.55
9/1/2016	96.33	95.71	93.09	2.62	-0.62
10/1/2016	98.51	94.96	94.96	0.00	-3.55
11/1/2016	83.85	91.52	91.26	0.26	7.66
12/1/2016	82.42	90.41	90.74	-0.33	7.99
1/1/2017	79.89	95.98	97.36	-1.38	16.09
2/1/2017	89.01	93.67	93.14	0.52	4.66
3/1/2017	101.93	98.30	98.25	0.05	-3.63
4/1/2017	96.03	98.74	98.79	-0.05	2.71
5/1/2017	104.72	100.42	99.74	0.68	-4.29
6/1/2017	110.34	98.43	98.07	0.35	-11.91

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
7/1/2017	100.19	95.88	95.79	0.09	-4.31
8/1/2017	106.47	94.20	93.94	0.26	-12.27
9/1/2017	93.34	94.91	93.51	1.41	1.57
10/1/2017	105.80	100.58	100.48	0.10	-5.22
11/1/2017	93.66	101.37	101.89	-0.52	7.71
12/1/2017	84.64	95.04	95.33	-0.29	10.40
1/1/2018	82.13	98.39	97.97	0.43	16.26
2/1/2018	91.68	95.91	95.51	0.40	4.23
3/1/2018	94.70	93.55	93.13	0.42	-1.15
4/1/2018	92.48	93.94	93.53	0.41	1.46
5/1/2018	99.06	94.61	93.99	0.62	-4.45
6/1/2018	108.13	97.53	96.54	0.99	-10.61
7/1/2018	97.99	92.42	92.37	0.06	-5.56
8/1/2018	108.81	95.77	95.40	0.37	-13.04
9/1/2018	89.98	93.27	92.33	0.94	3.29
10/1/2018	94.69	89.26	89.39	-0.13	-5.43
11/1/2018	81.49	89.00	89.50	-0.50	7.52
12/1/2018	82.44	93.17	93.04	0.13	10.73
1/1/2019	76.38	91.65	91.42	0.24	15.27
2/1/2019	91.22	93.54	94.43	-0.89	2.32
3/1/2019	93.75	93.66	93.67	-0.01	-0.09
4/1/2019	94.24	93.46	93.64	-0.17	-0.78
5/1/2019	97.07	93.50	93.66	-0.16	-3.57
6/1/2019	102.81	93.53	93.68	-0.15	-9.29
7/1/2019	100.91	93.55	93.70	-0.14	-7.36



	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
8/1/2019	104.76	93.58	93.71	-0.13	-11.18
9/1/2019	92.00	93.60	93.72	-0.12	1.60
10/1/2019	99.11	93.62	93.73	-0.12	-5.49
11/1/2019	82.98	93.64	93.74	-0.11	10.65
12/1/2019	84.86	93.65	93.75	-0.10	8.79
1/1/2020	78.00	93.67	93.76	-0.09	15.67
2/1/2020	89.82	93.68	93.77	-0.09	3.86
3/1/2020	96.71	93.69	93.77	-0.08	-3.02

**Table 5: ISIC18**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	91.99	98.04	97.54	0.51	6.05
2/1/2010	99.51	98.02	97.85	0.17	-1.49
3/1/2010	103.57	98.47	98.54	-0.07	-5.10
4/1/2010	98.42	98.92	98.71	0.21	0.50
5/1/2010	101.64	99.66	99.82	-0.17	-1.98
6/1/2010	100.20	100.27	99.73	0.54	0.06
7/1/2010	100.11	101.52	100.87	0.65	1.40
8/1/2010	96.39	100.27	100.25	0.03	3.88
9/1/2010	103.02	101.77	101.44	0.33	-1.25
10/1/2010	101.43	100.71	100.68	0.03	-0.72
11/1/2010	99.64	101.44	101.73	-0.29	1.80
12/1/2010	104.09	100.61	101.23	-0.62	-3.47

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2011	97.78	103.12	102.94	0.18	5.34
2/1/2011	105.88	103.05	102.90	0.15	-2.83
3/1/2011	110.81	104.85	104.22	0.63	-5.97
4/1/2011	101.66	104.07	104.24	-0.17	2.41
5/1/2011	107.74	104.51	104.81	-0.30	-3.23
6/1/2011	101.91	105.04	105.54	-0.50	3.13
7/1/2011	98.21	105.27	105.73	-0.47	7.06
8/1/2011	104.88	107.24	107.35	-0.11	2.37
9/1/2011	107.04	107.03	107.51	-0.48	-0.01
10/1/2011	110.46	109.75	109.86	-0.11	-0.71
11/1/2011	113.19	110.98	110.20	0.77	-2.21
12/1/2011	118.03	113.01	112.23	0.78	-5.02
1/1/2012	107.27	112.17	111.87	0.30	4.90
2/1/2012	116.89	114.88	113.10	1.78	-2.01
3/1/2012	114.47	111.89	112.39	-0.49	-2.58
4/1/2012	110.91	113.25	112.71	0.54	2.33
5/1/2012	119.59	113.75	112.96	0.79	-5.84
6/1/2012	106.70	112.71	112.45	0.27	6.02
7/1/2012	109.31	113.51	113.15	0.36	4.21
8/1/2012	113.16	113.04	112.35	0.69	-0.12
9/1/2012	111.96	112.18	112.31	-0.13	0.22
10/1/2012	117.53	111.64	111.14	0.50	-5.88
11/1/2012	112.05	108.72	110.21	-1.49	-3.34
12/1/2012	112.84	109.13	109.73	-0.60	-3.71
1/1/2013	100.19	109.47	108.94	0.54	9.28

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2013	102.04	108.03	108.81	-0.79	5.98
3/1/2013	108.86	108.54	107.89	0.64	-0.33
4/1/2013	110.36	109.23	108.61	0.62	-1.13
5/1/2013	111.69	107.52	106.64	0.88	-4.17
6/1/2013	104.03	108.33	107.42	0.91	4.30
7/1/2013	100.02	104.27	104.43	-0.16	4.25
8/1/2013	104.45	105.24	105.09	0.15	0.79
9/1/2013	107.15	102.32	102.97	-0.65	-4.83
10/1/2013	111.06	103.82	103.59	0.23	-7.25
11/1/2013	111.38	103.32	102.56	0.76	-8.07
12/1/2013	110.13	100.94	101.92	-0.98	-9.19
1/1/2014	86.86	101.93	101.87	0.06	15.07
2/1/2014	91.43	102.31	101.59	0.72	10.88
3/1/2014	100.37	101.15	101.33	-0.18	0.78
4/1/2014	97.67	100.34	100.33	0.01	2.67
5/1/2014	97.73	100.14	100.30	-0.16	2.41
6/1/2014	93.73	100.16	99.69	0.47	6.43
7/1/2014	96.72	100.14	99.87	0.27	3.42
8/1/2014	98.18	99.71	99.42	0.29	1.53
9/1/2014	115.83	100.41	99.26	1.15	-15.42
10/1/2014	107.40	98.71	98.77	-0.06	-8.69
11/1/2014	109.93	98.55	98.07	0.47	-11.39
12/1/2014	123.68	100.44	98.00	2.44	-23.24
1/1/2015	72.79	95.58	95.92	-0.34	22.79
2/1/2015	74.52	93.74	94.93	-1.18	19.23

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
3/1/2015	93.85	94.84	94.64	0.20	0.99
4/1/2015	90.15	94.35	93.66	0.68	4.20
5/1/2015	85.52	92.03	93.31	-1.27	6.52
6/1/2015	83.70	90.96	91.60	-0.65	7.25
7/1/2015	89.75	93.46	92.73	0.73	3.70
8/1/2015	89.64	90.94	90.92	0.03	1.30
9/1/2015	110.85	92.90	92.03	0.88	-17.94
10/1/2015	98.16	90.48	90.14	0.34	-7.68
11/1/2015	107.74	91.78	90.56	1.22	-15.96
12/1/2015	111.56	89.95	88.58	1.37	-21.61
1/1/2016	62.38	86.96	87.23	-0.27	24.58
2/1/2016	69.60	85.79	85.54	0.25	16.19
3/1/2016	83.71	84.72	84.57	0.15	1.01
4/1/2016	75.36	83.35	83.61	-0.26	7.99
5/1/2016	84.58	84.42	83.22	1.19	-0.16
6/1/2016	80.10	81.37	81.98	-0.61	1.27
7/1/2016	70.90	81.05	81.05	0.01	10.15
8/1/2016	84.53	80.86	80.46	0.40	-3.67
9/1/2016	94.22	79.67	79.23	0.44	-14.55
10/1/2016	82.56	79.26	78.85	0.41	-3.30
11/1/2016	88.88	76.75	77.06	-0.31	-12.13
12/1/2016	85.12	76.17	77.12	-0.95	-8.95
1/1/2017	60.01	76.72	76.74	-0.02	16.71
2/1/2017	65.77	78.18	77.65	0.53	12.41
3/1/2017	81.70	78.64	77.32	1.32	-3.06

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
4/1/2017	68.20	77.68	78.13	-0.45	9.48
5/1/2017	80.52	77.92	77.19	0.73	-2.59
6/1/2017	84.99	80.33	78.69	1.65	-4.65
7/1/2017	64.38	75.04	77.17	-2.14	10.65
8/1/2017	82.08	79.64	79.01	0.64	-2.44
9/1/2017	87.34	79.98	79.65	0.33	-7.36
10/1/2017	80.24	78.64	80.12	-1.47	-1.60
11/1/2017	95.37	83.86	82.55	1.31	-11.51
12/1/2017	85.80	81.86	82.40	-0.54	-3.94
1/1/2018	74.59	85.59	84.54	1.05	11.00
2/1/2018	76.10	86.55	84.58	1.97	10.45
3/1/2018	82.93	85.30	85.66	-0.36	2.38
4/1/2018	80.41	86.49	85.77	0.72	6.07
5/1/2018	88.49	87.00	87.15	-0.14	-1.48
6/1/2018	89.24	86.87	87.04	-0.17	-2.37
7/1/2018	96.12	90.97	88.70	2.27	-5.15
8/1/2018	88.32	87.30	87.64	-0.34	-1.02
9/1/2018	88.65	87.14	87.65	-0.51	-1.52
10/1/2018	99.02	89.33	87.88	1.46	-9.69
11/1/2018	90.32	86.12	86.73	-0.62	-4.20
12/1/2018	92.83	88.18	87.08	1.11	-4.65
1/1/2019	77.28	87.65	85.96	1.70	10.37
2/1/2019	70.24	86.06	85.57	0.49	15.83
3/1/2019	83.34	87.55	85.53	2.03	4.21
4/1/2019	78.47	87.56	85.01	2.55	9.09

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
5/1/2019	82.77	87.60	85.00	2.60	4.83
6/1/2019	84.77	87.76	84.67	3.08	2.99
7/1/2019	90.19	87.83	84.44	3.39	-2.36
8/1/2019	83.77	87.96	84.29	3.67	4.18
9/1/2019	85.44	88.05	84.00	4.04	2.60
10/1/2019	92.34	88.16	83.84	4.32	-4.18
11/1/2019	83.44	88.26	83.63	4.64	4.82
12/1/2019	88.95	88.37	83.42	4.96	-0.58
1/1/2020	76.44	88.48	83.24	5.23	12.04
2/1/2020	69.13	88.58	83.04	5.55	19.45
3/1/2020	82.96	88.69	82.86	5.83	5.73

Table 6: ISIC22

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2010	74.05	83.14	81.14	2.00	9.08
2/1/2010	85.14	89.62	88.62	1.00	4.48
3/1/2010	89.26	90.72	91.00	-0.27	1.47
4/1/2010	88.56	91.39	92.18	-0.79	2.83
5/1/2010	103.73	93.83	95.85	-2.03	-9.90
6/1/2010	106.73	96.87	98.31	-1.44	-9.86
7/1/2010	102.34	100.60	101.28	-0.68	-1.74
8/1/2010	109.17	103.47	103.82	-0.35	-5.70
9/1/2010	111.41	108.13	108.23	-0.10	-3.28

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
10/1/2010	114.82	111.78	111.25	0.54	-3.04
11/1/2010	107.61	113.59	112.35	1.23	5.98
12/1/2010	107.17	116.58	115.31	1.27	9.41
1/1/2011	108.64	120.66	119.24	1.42	12.03
2/1/2011	107.10	112.45	111.61	0.84	5.35
3/1/2011	110.77	113.02	112.78	0.25	2.25
4/1/2011	107.42	112.05	112.53	-0.49	4.62
5/1/2011	123.96	111.57	112.90	-1.33	-12.38
6/1/2011	118.05	106.96	108.28	-1.32	-11.09
7/1/2011	108.18	107.58	107.91	-0.32	-0.59
8/1/2011	117.91	110.43	110.77	-0.34	-7.48
9/1/2011	114.20	111.04	111.13	-0.09	-3.16
10/1/2011	115.63	112.89	112.44	0.45	-2.74
11/1/2011	107.61	113.44	112.78	0.66	5.83
12/1/2011	104.27	115.14	114.10	1.04	10.87
1/1/2012	104.07	114.55	113.89	0.66	10.48
2/1/2012	113.96	119.53	118.72	0.81	5.58
3/1/2012	119.74	123.38	123.25	0.14	3.64
4/1/2012	119.67	125.03	124.87	0.16	5.36
5/1/2012	138.34	124.58	124.19	0.39	-13.76
6/1/2012	139.30	128.56	128.20	0.37	-10.73
7/1/2012	135.22	132.31	132.56	-0.25	-2.91
8/1/2012	140.08	130.90	131.13	-0.22	-9.17
9/1/2012	130.98	130.52	130.26	0.25	-0.46
10/1/2012	134.24	128.13	127.98	0.14	-6.12

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
11/1/2012	123.21	128.90	129.40	-0.49	5.69
12/1/2012	112.51	124.81	124.88	-0.07	12.30
1/1/2013	119.27	131.13	129.92	1.21	11.86
2/1/2013	128.55	134.03	134.71	-0.68	5.48
3/1/2013	126.69	132.52	132.08	0.43	5.83
4/1/2013	132.83	136.70	136.98	-0.28	3.87
5/1/2013	144.84	130.55	129.63	0.93	-14.29
6/1/2013	146.54	135.88	135.64	0.24	-10.65
7/1/2013	141.30	136.46	136.69	-0.23	-4.85
8/1/2013	145.26	137.45	137.42	0.02	-7.81
9/1/2013	133.60	131.56	131.45	0.11	-2.04
10/1/2013	138.94	132.67	132.55	0.12	-6.27
11/1/2013	124.07	132.42	131.73	0.69	8.35
12/1/2013	120.61	132.97	132.25	0.72	12.36
1/1/2014	118.67	130.53	129.68	0.85	11.85
2/1/2014	132.27	138.44	139.24	-0.80	6.16
3/1/2014	137.71	143.34	144.02	-0.68	5.63
4/1/2014	144.13	148.83	149.02	-0.19	4.70
5/1/2014	165.12	149.12	148.73	0.39	-16.00
6/1/2014	168.52	154.69	153.93	0.76	-13.83
7/1/2014	153.60	148.56	148.72	-0.15	-5.04
8/1/2014	148.45	142.40	142.16	0.24	-6.06
9/1/2014	148.97	144.69	144.69	0.00	-4.28
10/1/2014	156.87	149.53	149.36	0.17	-7.33
11/1/2014	139.46	150.65	149.16	1.49	11.19



	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
12/1/2014	142.68	154.45	153.88	0.57	11.77
1/1/2015	130.18	144.74	143.28	1.46	14.56
2/1/2015	135.18	143.56	142.81	0.75	8.38
3/1/2015	137.71	142.24	143.11	-0.87	4.53
4/1/2015	132.88	138.11	138.31	-0.20	5.22
5/1/2015	158.18	143.30	143.88	-0.58	-14.88
6/1/2015	154.19	139.82	139.75	0.07	-14.38
7/1/2015	145.30	140.97	141.11	-0.14	-4.33
8/1/2015	151.42	145.28	144.98	0.30	-6.14
9/1/2015	150.60	145.85	145.78	0.07	-4.76
10/1/2015	152.00	146.62	146.28	0.34	-5.38
11/1/2015	138.62	147.23	146.40	0.82	8.61
12/1/2015	138.12	149.17	148.74	0.43	11.06
1/1/2016	132.66	147.87	146.69	1.18	15.21
2/1/2016	140.86	149.80	148.67	1.13	8.94
3/1/2016	141.98	146.98	146.35	0.64	5.01
4/1/2016	141.25	149.13	149.19	-0.05	7.88
5/1/2016	163.40	146.48	146.67	-0.19	-16.92
6/1/2016	165.45	148.96	150.14	-1.17	-16.49
7/1/2016	157.80	157.19	156.95	0.24	-0.61
8/1/2016	164.75	154.26	154.27	-0.01	-10.49
9/1/2016	161.30	155.84	155.73	0.11	-5.46
10/1/2016	160.36	156.72	156.20	0.52	-3.64
11/1/2016	150.82	158.29	157.50	0.79	7.47
12/1/2016	137.15	149.85	149.36	0.48	12.70

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2017	142.74	154.37	155.13	-0.75	11.63
2/1/2017	144.52	154.51	153.30	1.21	9.99
3/1/2017	151.21	156.20	156.10	0.10	5.00
4/1/2017	148.74	159.33	159.21	0.12	10.59
5/1/2017	183.01	162.40	161.91	0.49	-20.61
6/1/2017	170.25	154.58	154.47	0.11	-15.67
7/1/2017	151.17	151.08	150.92	0.17	-0.09
8/1/2017	164.58	154.23	154.23	0.01	-10.35
9/1/2017	161.46	157.74	157.45	0.29	-3.72
10/1/2017	164.53	159.24	158.96	0.28	-5.29
11/1/2017	157.61	164.36	164.86	-0.50	6.75
12/1/2017	149.49	164.94	164.28	0.67	15.45
1/1/2018	155.73	167.38	166.32	1.07	11.65
2/1/2018	151.61	161.72	160.91	0.81	10.12
3/1/2018	154.38	162.19	161.34	0.85	7.81
4/1/2018	148.30	157.98	157.58	0.40	9.69
5/1/2018	186.67	165.47	164.96	0.51	-21.20
6/1/2018	182.85	168.35	167.45	0.90	-14.50
7/1/2018	167.50	165.41	165.43	-0.02	-2.09
8/1/2018	179.72	168.19	168.14	0.05	-11.53
9/1/2018	170.50	168.36	167.85	0.51	-2.14
10/1/2018	169.30	162.22	162.20	0.02	-7.08
11/1/2018	151.46	158.54	159.05	-0.51	7.07
12/1/2018	151.44	167.53	166.36	1.18	16.10
1/1/2019	160.09	171.53	170.41	1.11	11.44

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2019	157.06	165.64	166.67	-1.03	8.58
3/1/2019	157.16	166.60	166.06	0.55	9.44
4/1/2019	159.33	167.26	166.15	1.11	7.93
5/1/2019	188.12	167.91	166.23	1.68	-20.21
6/1/2019	181.55	168.57	166.31	2.26	-12.98
7/1/2019	173.45	169.23	166.39	2.84	-4.22
8/1/2019	179.40	169.89	166.46	3.43	-9.50
9/1/2019	174.91	170.56	166.54	4.02	-4.35
10/1/2019	178.67	171.23	166.61	4.62	-7.44
11/1/2019	160.73	171.90	166.68	5.22	11.18
12/1/2019	158.50	172.58	166.75	5.82	14.08
1/1/2020	161.79	173.25	166.82	6.43	11.46
2/1/2020	162.90	173.93	166.89	7.05	11.03
3/1/2020	168.19	174.61	166.95	7.66	6.42

Table 7: ISIC 23

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2010	79.60	91.03	90.65	0.39	11.43
2/1/2010	82.58	92.49	92.23	0.27	9.92
3/1/2010	89.71	93.90	93.93	-0.03	4.19
4/1/2010	96.62	96.62	96.54	0.08	0.01
5/1/2010	104.45	98.08	98.51	-0.43	-6.37
6/1/2010	107.08	99.68	99.77	-0.09	-7.40

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
7/1/2010	104.59	100.29	100.24	0.04	-4.31
8/1/2010	106.99	101.36	101.30	0.07	-5.62
9/1/2010	106.88	102.52	102.53	-0.01	-4.36
10/1/2010	113.64	105.62	105.57	0.05	-8.02
11/1/2010	107.77	106.66	106.44	0.21	-1.12
12/1/2010	100.08	106.89	106.88	0.01	6.81
1/1/2011	94.89	106.28	106.45	-0.17	11.39
2/1/2011	95.13	105.02	104.91	0.11	9.89
3/1/2011	101.82	105.51	105.20	0.30	3.68
4/1/2011	103.67	105.86	105.87	-0.01	2.19
5/1/2011	111.87	105.38	105.57	-0.20	-6.49
6/1/2011	112.75	105.82	106.14	-0.32	-6.93
7/1/2011	110.77	107.95	107.82	0.13	-2.82
8/1/2011	115.65	108.88	108.86	0.02	-6.77
9/1/2011	113.40	109.17	109.17	0.00	-4.23
10/1/2011	115.58	108.86	108.75	0.11	-6.71
11/1/2011	109.07	108.82	108.73	0.09	-0.25
12/1/2011	109.19	118.08	117.80	0.28	8.89
1/1/2012	110.83	121.92	122.17	-0.25	11.10
2/1/2012	110.64	119.56	119.13	0.43	8.92
3/1/2012	116.49	119.80	119.59	0.21	3.31
4/1/2012	117.46	119.92	119.61	0.30	2.46
5/1/2012	129.65	122.11	121.43	0.68	-7.54
6/1/2012	125.61	120.16	119.54	0.62	-5.45
7/1/2012	122.62	118.57	118.48	0.09	-4.04

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
8/1/2012	125.25	118.54	118.49	0.05	-6.71
9/1/2012	120.88	119.47	119.27	0.20	-1.42
10/1/2012	127.83	119.66	119.63	0.03	-8.16
11/1/2012	118.12	117.96	118.55	-0.58	-0.16
12/1/2012	109.08	118.41	118.81	-0.40	9.33
1/1/2013	107.84	118.77	118.44	0.33	10.93
2/1/2013	113.07	119.30	119.78	-0.48	6.23
3/1/2013	113.81	118.74	118.50	0.24	4.93
4/1/2013	118.40	116.89	116.74	0.15	-1.51
5/1/2013	121.48	115.04	114.34	0.70	-6.44
6/1/2013	122.97	118.56	118.37	0.19	-4.41
7/1/2013	123.84	118.29	118.21	0.08	-5.55
8/1/2013	124.12	119.04	118.90	0.14	-5.08
9/1/2013	117.98	115.87	115.74	0.13	-2.11
10/1/2013	121.31	115.17	115.11	0.05	-6.14
11/1/2013	114.93	117.48	117.24	0.24	2.55
12/1/2013	106.24	114.48	114.19	0.29	8.23
1/1/2014	102.23	113.24	113.14	0.10	11.01
2/1/2014	111.04	115.71	116.17	-0.46	4.67
3/1/2014	117.79	118.78	118.93	-0.15	0.99
4/1/2014	119.94	119.97	119.98	-0.01	0.03
5/1/2014	127.07	120.55	120.30	0.26	-6.52
6/1/2014	123.22	118.60	118.15	0.45	-4.62
7/1/2014	123.60	118.71	118.62	0.08	-4.89
8/1/2014	120.03	117.53	117.32	0.21	-2.50

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
9/1/2014	122.23	119.00	118.88	0.11	-3.24
10/1/2014	122.89	117.36	117.27	0.09	-5.52
11/1/2014	114.70	119.44	118.81	0.62	4.74
12/1/2014	115.59	121.43	121.22	0.21	5.84
1/1/2015	108.77	120.66	120.16	0.50	11.89
2/1/2015	115.59	119.47	119.03	0.43	3.88
3/1/2015	116.26	115.93	116.25	-0.32	-0.33
4/1/2015	114.18	114.45	114.44	0.01	0.27
5/1/2015	115.76	110.33	110.64	-0.31	-5.43
6/1/2015	115.21	110.18	110.01	0.16	-5.03
7/1/2015	113.71	109.59	109.53	0.06	-4.12
8/1/2015	110.91	109.25	109.03	0.22	-1.66
9/1/2015	112.09	109.05	108.89	0.16	-3.04
10/1/2015	113.05	109.20	108.98	0.23	-3.85
11/1/2015	102.43	106.43	106.14	0.29	4.00
12/1/2015	101.72	107.09	106.90	0.19	5.37
1/1/2016	94.20	105.52	105.26	0.27	11.33
2/1/2016	104.38	107.67	107.31	0.37	3.30
3/1/2016	105.45	107.01	106.80	0.21	1.56
4/1/2016	106.42	106.76	106.63	0.13	0.34
5/1/2016	115.30	108.03	108.08	-0.05	-7.27
6/1/2016	114.63	108.26	108.77	-0.51	-6.37
7/1/2016	112.12	109.99	109.74	0.24	-2.13
8/1/2016	113.68	109.57	109.42	0.15	-4.11
9/1/2016	114.66	111.57	111.33	0.23	-3.10

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
10/1/2016	115.99	113.65	113.22	0.42	-2.35
11/1/2016	108.47	112.18	111.60	0.58	3.71
12/1/2016	102.43	108.66	108.31	0.35	6.23
1/1/2017	111.15	121.18	122.02	-0.84	10.03
2/1/2017	115.86	119.51	119.11	0.40	3.65
3/1/2017	138.03	136.83	136.95	-0.12	-1.20
4/1/2017	127.06	130.92	131.14	-0.22	3.86
5/1/2017	141.59	130.20	129.96	0.25	-11.38
6/1/2017	119.79	113.42	113.30	0.12	-6.37
7/1/2017	115.82	113.63	113.45	0.18	-2.19
8/1/2017	121.07	117.25	117.09	0.16	-3.82
9/1/2017	118.33	118.01	117.77	0.23	-0.33
10/1/2017	119.59	119.24	118.96	0.28	-0.35
11/1/2017	116.28	121.72	121.75	-0.03	5.44
12/1/2017	117.39	125.72	125.38	0.34	8.34
1/1/2018	115.82	124.83	124.46	0.37	9.01
2/1/2018	123.16	125.15	124.71	0.45	2.00
3/1/2018	125.33	126.34	126.14	0.20	1.01
4/1/2018	128.21	127.69	127.33	0.35	-0.52
5/1/2018	140.74	128.03	127.77	0.25	-12.71
6/1/2018	134.04	127.92	127.44	0.47	-6.13
7/1/2018	134.69	129.88	129.73	0.15	-4.81
8/1/2018	133.18	128.91	128.72	0.19	-4.27
9/1/2018	126.62	128.59	128.33	0.26	1.98
10/1/2018	125.69	126.69	126.59	0.10	1.00

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
11/1/2018	119.54	127.62	127.62	-0.01	8.08
12/1/2018	119.73	129.67	129.20	0.47	9.94
1/1/2019	124.16	133.21	132.88	0.33	9.05
2/1/2019	135.23	134.70	135.17	-0.47	-0.52
3/1/2019	135.61	134.68	134.43	0.24	-0.93
4/1/2019	136.06	134.87	134.64	0.23	-1.19
5/1/2019	148.22	135.05	134.81	0.24	-13.17
6/1/2019	140.93	135.22	134.97	0.25	-5.71
7/1/2019	142.28	135.38	135.13	0.26	-6.89
8/1/2019	138.59	135.54	135.27	0.27	-3.06
9/1/2019	134.93	135.68	135.41	0.28	0.76
10/1/2019	134.28	135.82	135.54	0.29	1.54
11/1/2019	124.68	135.95	135.66	0.30	11.28
12/1/2019	127.04	136.08	135.78	0.30	9.04
1/1/2020	126.94	136.20	135.89	0.31	9.26
2/1/2020	135.48	136.31	135.99	0.32	0.83
3/1/2020	139.85	136.42	136.09	0.33	-3.43



**Table 8: ISIC25**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	87.54	95.36	94.95	0.41	7.82
2/1/2010	91.20	96.54	96.19	0.35	5.34
3/1/2010	97.87	97.88	97.92	-0.04	0.01
4/1/2010	98.72	98.86	98.92	-0.05	0.15
5/1/2010	97.81	98.71	99.48	-0.77	0.90
6/1/2010	101.14	98.52	98.76	-0.23	-2.62
7/1/2010	102.05	99.48	99.43	0.06	-2.56
8/1/2010	97.46	100.23	100.10	0.13	2.77
9/1/2010	105.46	101.93	101.87	0.06	-3.52
10/1/2010	104.94	103.33	103.23	0.10	-1.61
11/1/2010	106.42	105.96	105.59	0.37	-0.46
12/1/2010	109.40	104.14	104.00	0.14	-5.26
1/1/2011	100.93	108.77	109.16	-0.38	7.84
2/1/2011	101.78	107.28	107.14	0.14	5.50
3/1/2011	106.00	106.54	106.20	0.34	0.54
4/1/2011	105.03	106.80	106.82	-0.01	1.77
5/1/2011	105.24	105.59	105.89	-0.30	0.35
6/1/2011	110.24	106.82	107.23	-0.41	-3.43
7/1/2011	109.80	108.00	107.85	0.15	-1.80
8/1/2011	104.97	106.00	105.91	0.10	1.04
9/1/2011	109.67	105.79	105.71	0.08	-3.88
10/1/2011	109.66	108.18	108.02	0.16	-1.48
11/1/2011	106.74	106.72	106.55	0.16	-0.02
12/1/2011	114.43	110.34	110.02	0.32	-4.09

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2012	103.76	111.56	111.98	-0.42	7.80
2/1/2012	107.07	113.15	112.76	0.40	6.08
3/1/2012	110.66	112.72	112.58	0.14	2.06
4/1/2012	111.44	114.38	113.99	0.39	2.94
5/1/2012	111.66	111.66	110.76	0.90	0.00
6/1/2012	112.67	111.00	110.26	0.74	-1.67
7/1/2012	116.61	112.81	112.69	0.12	-3.80
8/1/2012	111.90	111.43	111.33	0.10	-0.46
9/1/2012	115.71	113.27	113.04	0.23	-2.44
10/1/2012	116.68	112.09	112.03	0.06	-4.59
11/1/2012	112.93	111.93	112.63	-0.70	-1.00
12/1/2012	114.89	111.21	111.73	-0.52	-3.68
1/1/2013	101.48	110.37	110.00	0.37	8.89
2/1/2013	106.43	113.14	113.83	-0.70	6.71
3/1/2013	110.66	115.47	115.06	0.41	4.81
4/1/2013	111.55	114.43	114.46	-0.02	2.88
5/1/2013	110.10	109.39	108.39	1.00	-0.71
6/1/2013	117.06	115.18	114.91	0.27	-1.89
7/1/2013	116.96	111.43	111.37	0.06	-5.53
8/1/2013	111.00	109.74	109.61	0.13	-1.26
9/1/2013	117.79	112.71	112.55	0.16	-5.08
10/1/2013	116.45	111.48	111.39	0.09	-4.97
11/1/2013	111.91	113.04	112.75	0.28	1.13
12/1/2013	113.74	109.08	108.77	0.31	-4.66
1/1/2014	101.68	111.61	111.32	0.29	9.93

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2014	100.89	109.01	109.65	-0.64	8.12
3/1/2014	105.13	110.93	111.29	-0.36	5.80
4/1/2014	107.98	113.52	113.45	0.07	5.54
5/1/2014	120.23	118.30	117.90	0.40	-1.92
6/1/2014	117.30	114.17	113.59	0.58	-3.13
7/1/2014	123.28	117.24	117.16	0.08	-6.04
8/1/2014	123.32	120.62	120.44	0.18	-2.70
9/1/2014	120.85	113.17	113.08	0.08	-7.69
10/1/2014	125.64	119.93	119.82	0.11	-5.71
11/1/2014	116.84	120.12	119.38	0.74	3.28
12/1/2014	137.17	128.66	128.46	0.20	-8.51
1/1/2015	101.17	113.04	112.31	0.74	11.87
2/1/2015	107.96	118.70	118.19	0.51	10.75
3/1/2015	112.70	119.16	119.54	-0.38	6.46
4/1/2015	108.63	116.82	116.71	0.11	8.19
5/1/2015	119.15	116.64	117.04	-0.41	-2.51
6/1/2015	124.92	119.18	118.96	0.23	-5.74
7/1/2015	131.04	125.15	125.05	0.09	-5.90
8/1/2015	130.84	126.63	126.44	0.19	-4.22
9/1/2015	142.36	131.42	131.32	0.10	-10.95
10/1/2015	125.27	121.31	121.14	0.17	-3.96
11/1/2015	119.06	121.05	120.70	0.35	1.99
12/1/2015	128.67	122.24	122.09	0.15	-6.42
1/1/2016	112.60	124.71	124.15	0.56	12.10
2/1/2016	124.37	137.40	136.60	0.80	13.03

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
3/1/2016	147.75	157.96	156.80	1.17	10.22
4/1/2016	117.43	129.33	129.17	0.17	11.90
5/1/2016	139.52	132.89	133.00	-0.11	-6.63
6/1/2016	148.03	138.83	139.70	-0.87	-9.20
7/1/2016	133.79	132.59	132.33	0.27	-1.20
8/1/2016	144.06	136.17	136.09	0.07	-7.89
9/1/2016	148.49	137.51	137.41	0.09	-10.98
10/1/2016	143.68	140.30	140.02	0.28	-3.38
11/1/2016	141.56	141.50	140.92	0.58	-0.05
12/1/2016	135.10	130.30	130.11	0.19	-4.80
1/1/2017	132.99	139.34	140.42	-1.08	6.35
2/1/2017	114.42	129.35	128.55	0.80	14.93
3/1/2017	127.06	136.69	136.38	0.31	9.63
4/1/2017	126.12	141.33	141.12	0.21	15.21
5/1/2017	155.01	143.98	143.57	0.41	-11.03
6/1/2017	152.18	144.86	144.58	0.28	-7.31
7/1/2017	138.48	138.26	137.96	0.30	-0.22
8/1/2017	153.86	146.76	146.57	0.19	-7.10
9/1/2017	149.97	142.28	142.04	0.23	-7.69
10/1/2017	150.43	145.55	145.31	0.24	-4.89
11/1/2017	142.69	141.61	141.95	-0.34	-1.08
12/1/2017	150.23	143.96	143.81	0.15	-6.27
1/1/2018	150.54	153.80	153.32	0.49	3.26
2/1/2018	129.29	145.74	145.06	0.68	16.45
3/1/2018	125.41	136.98	136.28	0.70	11.57

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
4/1/2018	126.25	140.74	140.19	0.55	14.49
5/1/2018	158.26	145.59	145.26	0.34	-12.67
6/1/2018	140.61	137.91	137.17	0.74	-2.70
7/1/2018	147.34	145.02	144.78	0.24	-2.32
8/1/2018	142.16	137.85	137.60	0.25	-4.31
9/1/2018	145.92	141.61	141.27	0.35	-4.31
10/1/2018	146.97	141.80	141.61	0.19	-5.17
11/1/2018	147.40	146.47	146.62	-0.15	-0.93
12/1/2018	163.00	154.00	153.49	0.51	-9.00
1/1/2019	144.07	146.99	146.65	0.34	2.93
2/1/2019	133.30	148.52	149.37	-0.85	15.22
3/1/2019	144.35	156.92	156.70	0.22	12.58
4/1/2019	138.81	152.12	151.97	0.15	13.32
5/1/2019	165.29	152.80	152.65	0.15	-12.49
6/1/2019	154.70	153.49	153.34	0.15	-1.21
7/1/2019	158.75	154.18	154.03	0.15	-4.57
8/1/2019	157.08	154.87	154.72	0.14	-2.22
9/1/2019	161.95	155.56	155.42	0.14	-6.39
10/1/2019	161.49	156.26	156.12	0.14	-5.23
11/1/2019	154.40	156.96	156.82	0.14	2.56
12/1/2019	170.04	157.66	157.53	0.14	-12.38
1/1/2020	154.99	158.37	158.24	0.13	3.38
2/1/2020	140.81	159.08	158.95	0.13	18.27
3/1/2020	150.64	159.79	159.66	0.13	9.16

**Table 9: ISIC26**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	84.32	96.91	96.09	0.82	12.58
2/1/2010	85.25	96.96	95.95	1.00	11.70
3/1/2010	106.73	101.28	101.10	0.18	-5.45
4/1/2010	91.79	97.25	97.11	0.14	5.46
5/1/2010	102.08	97.14	99.34	-2.20	-4.94
6/1/2010	101.48	97.85	98.45	-0.61	-3.64
7/1/2010	100.82	101.82	101.63	0.20	1.01
8/1/2010	96.46	99.56	99.38	0.19	3.11
9/1/2010	96.10	100.14	99.96	0.18	4.03
10/1/2010	93.63	101.66	101.54	0.11	8.02
11/1/2010	129.57	103.96	103.12	0.84	-25.61
12/1/2010	111.76	104.30	103.87	0.43	-7.46
1/1/2011	95.79	108.04	108.99	-0.95	12.24
2/1/2011	97.62	110.11	109.61	0.49	12.49
3/1/2011	118.79	114.16	113.11	1.05	-4.63
4/1/2011	102.25	110.78	110.70	0.08	8.53
5/1/2011	121.17	114.27	115.24	-0.97	-6.90
6/1/2011	114.78	110.32	111.18	-0.86	-4.45
7/1/2011	109.79	113.96	113.76	0.20	4.17
8/1/2011	109.28	109.73	109.46	0.27	0.44
9/1/2011	107.06	111.19	110.96	0.23	4.13
10/1/2011	105.52	114.39	114.22	0.17	8.86
11/1/2011	145.64	116.02	115.70	0.32	-29.62
12/1/2011	119.13	113.64	113.09	0.55	-5.49

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2012	108.53	119.63	120.69	-1.06	11.09
2/1/2012	109.14	122.59	121.74	0.85	13.45
3/1/2012	113.80	112.58	112.19	0.39	-1.22
4/1/2012	110.74	120.74	119.81	0.93	10.00
5/1/2012	128.32	122.25	119.99	2.27	-6.07
6/1/2012	118.11	118.52	116.90	1.62	0.42
7/1/2012	114.40	116.25	115.96	0.28	1.85
8/1/2012	126.00	125.73	125.43	0.30	-0.27
9/1/2012	116.37	126.24	126.06	0.17	9.87
10/1/2012	115.13	118.32	118.02	0.30	3.19
11/1/2012	156.71	122.68	124.33	-1.65	-34.03
12/1/2012	118.66	113.14	114.53	-1.39	-5.51
1/1/2013	111.68	122.77	121.86	0.91	11.09
2/1/2013	105.86	117.83	119.61	-1.79	11.96
3/1/2013	115.28	117.74	117.16	0.58	2.46
4/1/2013	106.75	112.78	112.57	0.21	6.03
5/1/2013	118.95	114.71	112.09	2.61	-4.25
6/1/2013	118.58	120.47	119.89	0.58	1.90
7/1/2013	113.14	112.18	111.83	0.34	-0.97
8/1/2013	115.55	118.01	117.73	0.28	2.46
9/1/2013	112.07	118.58	118.34	0.24	6.52
10/1/2013	112.94	115.40	115.11	0.28	2.46
11/1/2013	162.04	133.47	132.94	0.53	-28.57
12/1/2013	125.90	117.39	116.85	0.54	-8.50
1/1/2014	106.77	118.40	117.67	0.73	11.63

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2014	108.08	121.31	123.12	-1.81	13.23
3/1/2014	115.51	116.32	117.59	-1.27	0.81
4/1/2014	113.90	119.70	119.43	0.27	5.80
5/1/2014	125.14	122.18	121.09	1.10	-2.95
6/1/2014	122.13	121.36	119.94	1.41	-0.78
7/1/2014	136.68	134.77	134.32	0.45	-1.91
8/1/2014	120.28	125.82	125.54	0.29	5.54
9/1/2014	128.43	133.12	132.74	0.38	4.69
10/1/2014	141.51	143.61	143.24	0.37	2.09
11/1/2014	142.75	123.79	122.39	1.39	-18.97
12/1/2014	167.19	149.60	149.06	0.54	-17.59
1/1/2015	122.67	141.83	140.09	1.74	19.16
2/1/2015	123.22	142.86	141.77	1.09	19.64
3/1/2015	146.35	143.44	145.01	-1.57	-2.91
4/1/2015	137.94	143.33	143.02	0.31	5.39
5/1/2015	135.27	132.58	133.66	-1.08	-2.69
6/1/2015	147.29	140.45	139.67	0.78	-6.84
7/1/2015	128.20	125.86	125.41	0.45	-2.34
8/1/2015	130.39	135.79	135.45	0.34	5.41
9/1/2015	125.86	130.90	130.47	0.43	5.04
10/1/2015	129.91	135.33	134.99	0.34	5.42
11/1/2015	158.89	135.40	134.52	0.88	-23.48
12/1/2015	155.99	139.01	138.60	0.41	-16.98
1/1/2016	124.51	148.86	147.96	0.90	24.35
2/1/2016	130.24	153.83	151.75	2.08	23.59



	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
3/1/2016	140.21	137.44	135.80	1.64	-2.77
4/1/2016	137.66	145.75	145.47	0.27	8.08
5/1/2016	142.58	135.74	135.95	-0.21	-6.83
6/1/2016	148.91	138.07	139.70	-1.62	-10.84
7/1/2016	150.51	153.15	152.78	0.37	2.64
8/1/2016	151.51	149.01	148.54	0.47	-2.50
9/1/2016	142.85	147.71	147.24	0.47	4.86
10/1/2016	143.16	152.95	152.61	0.34	9.79
11/1/2016	189.55	159.14	157.67	1.47	-30.41
12/1/2016	168.47	153.89	153.57	0.33	-14.57
1/1/2017	124.39	144.69	147.06	-2.37	20.30
2/1/2017	109.01	132.99	131.08	1.90	23.98
3/1/2017	161.80	157.38	156.81	0.57	-4.41
4/1/2017	135.46	146.51	146.33	0.18	11.05
5/1/2017	167.96	154.63	153.48	1.15	-13.32
6/1/2017	172.44	160.57	159.85	0.72	-11.87
7/1/2017	153.52	154.59	154.26	0.32	1.07
8/1/2017	153.48	149.89	149.46	0.44	-3.59
9/1/2017	139.85	147.44	147.01	0.43	7.58
10/1/2017	131.99	137.96	137.55	0.41	5.97
11/1/2017	166.24	139.26	139.98	-0.72	-26.97
12/1/2017	143.36	134.26	134.08	0.18	-9.10
1/1/2018	110.09	130.49	129.39	1.10	20.40
2/1/2018	106.29	130.21	129.00	1.21	23.92
3/1/2018	133.81	134.65	133.42	1.24	0.85

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
4/1/2018	135.87	143.81	142.57	1.24	7.95
5/1/2018	167.12	152.02	151.06	0.96	-15.10
6/1/2018	150.03	143.55	142.10	1.44	-6.48
7/1/2018	145.84	143.12	142.73	0.40	-2.72
8/1/2018	149.95	146.20	145.77	0.43	-3.75
9/1/2018	138.03	148.86	148.50	0.36	10.83
10/1/2018	147.83	150.58	150.08	0.50	2.75
11/1/2018	164.57	139.49	139.97	-0.48	-25.08
12/1/2018	168.17	157.75	156.57	1.18	-10.41
1/1/2019	100.95	120.36	119.50	0.87	19.42
2/1/2019	114.47	136.48	138.37	-1.89	22.01
3/1/2019	139.03	142.25	142.08	0.17	3.23
4/1/2019	145.18	147.47	148.05	-0.58	2.29
5/1/2019	167.59	150.98	150.96	0.02	-16.61
6/1/2019	158.63	153.86	153.97	-0.11	-4.77
7/1/2019	163.26	155.99	155.90	0.09	-7.27
8/1/2019	158.16	157.71	157.61	0.10	-0.45
9/1/2019	151.59	159.09	158.92	0.18	7.51
10/1/2019	157.68	160.26	160.06	0.20	2.58
11/1/2019	184.30	161.27	161.03	0.24	-23.03
12/1/2019	178.48	162.16	161.91	0.26	-16.32
1/1/2020	137.44	162.99	162.71	0.28	25.54
2/1/2020	133.07	163.76	163.47	0.29	30.69
3/1/2020	164.91	164.50	164.19	0.31	-0.41

**Table 10: ISIC27**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	84.32	95.92	95.26	0.66	11.60
2/1/2010	85.25	96.38	95.75	0.63	11.12
3/1/2010	106.73	100.09	99.64	0.44	-6.65
4/1/2010	91.79	98.45	98.08	0.37	6.66
5/1/2010	102.08	97.39	98.61	-1.22	-4.69
6/1/2010	101.48	99.64	99.79	-0.15	-1.84
7/1/2010	100.82	102.49	102.19	0.30	1.67
8/1/2010	96.46	100.98	101.16	-0.18	4.53
9/1/2010	96.10	101.47	101.52	-0.05	5.37
10/1/2010	93.63	102.68	102.99	-0.31	9.05
11/1/2010	129.57	102.93	102.76	0.17	-26.64
12/1/2010	111.76	106.11	105.92	0.19	-5.65
1/1/2011	95.79	107.43	108.01	-0.58	11.63
2/1/2011	97.62	109.67	109.26	0.40	12.05
3/1/2011	118.79	113.80	112.78	1.02	-4.99
4/1/2011	102.25	111.81	111.80	0.02	9.56
5/1/2011	121.17	114.38	114.69	-0.30	-6.79
6/1/2011	114.78	112.41	112.76	-0.35	-2.37
7/1/2011	109.79	114.59	114.76	-0.17	4.80
8/1/2011	109.28	111.50	111.15	0.35	2.22
9/1/2011	107.06	111.89	111.70	0.19	4.83
10/1/2011	105.52	114.98	115.36	-0.38	9.45
11/1/2011	145.64	113.69	113.65	0.04	-31.95
12/1/2011	119.13	114.92	114.87	0.05	-4.22

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2012	108.53	119.70	120.10	-0.39	11.17
2/1/2012	109.14	123.05	121.99	1.06	13.92
3/1/2012	113.80	113.43	113.32	0.11	-0.37
4/1/2012	110.74	123.13	122.56	0.58	12.40
5/1/2012	128.32	122.26	120.52	1.75	-6.06
6/1/2012	118.11	119.60	118.54	1.06	1.50
7/1/2012	114.40	118.47	118.38	0.08	4.07
8/1/2012	126.00	127.26	126.56	0.70	1.25
9/1/2012	116.37	123.74	124.14	-0.40	7.37
10/1/2012	115.13	119.28	118.87	0.41	4.15
11/1/2012	156.71	117.49	118.40	-0.91	-39.22
12/1/2012	118.66	112.99	114.59	-1.61	-5.67
1/1/2013	111.68	123.88	122.80	1.08	12.20
2/1/2013	105.86	120.47	121.40	-0.94	14.60
3/1/2013	115.28	119.04	118.91	0.13	3.76
4/1/2013	106.75	118.46	118.19	0.27	11.71
5/1/2013	118.95	115.07	113.36	1.71	-3.88
6/1/2013	118.58	121.70	121.85	-0.15	3.12
7/1/2013	113.14	115.76	115.36	0.40	2.62
8/1/2013	115.55	119.83	119.51	0.33	4.28
9/1/2013	112.07	115.25	115.13	0.11	3.18
10/1/2013	112.94	114.75	114.39	0.36	1.81
11/1/2013	162.04	121.28	120.87	0.41	-40.76
12/1/2013	125.90	114.32	113.92	0.39	-11.58
1/1/2014	99.17	112.06	111.56	0.49	12.88

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2014	95.17	111.07	112.10	-1.03	15.90
3/1/2014	112.74	116.16	117.19	-1.03	3.42
4/1/2014	102.27	116.42	116.24	0.18	14.16
5/1/2014	122.88	121.06	120.67	0.39	-1.81
6/1/2014	113.36	115.89	115.14	0.76	2.53
7/1/2014	115.18	118.21	117.76	0.45	3.03
8/1/2014	104.22	112.20	112.35	-0.15	7.97
9/1/2014	115.09	114.36	113.80	0.57	-0.73
10/1/2014	116.55	115.68	115.08	0.61	-0.87
11/1/2014	149.88	111.94	111.34	0.60	-37.94
12/1/2014	140.62	119.54	118.59	0.96	-21.08
1/1/2015	92.03	107.03	106.35	0.68	15.00
2/1/2015	90.03	108.06	107.55	0.52	18.03
3/1/2015	103.16	105.16	105.90	-0.74	2.00
4/1/2015	86.11	100.01	99.84	0.17	13.90
5/1/2015	100.39	101.18	102.37	-1.18	0.79
6/1/2015	102.48	104.20	103.78	0.42	1.72
7/1/2015	98.13	101.56	101.07	0.49	3.43
8/1/2015	92.97	101.67	101.95	-0.28	8.71
9/1/2015	109.34	107.72	107.15	0.57	-1.62
10/1/2015	106.65	106.52	106.18	0.34	-0.13
11/1/2015	146.14	105.04	104.52	0.52	-41.10
12/1/2015	129.94	108.34	107.55	0.79	-21.60
1/1/2016	91.57	107.68	107.54	0.15	16.11
2/1/2016	89.04	107.18	106.31	0.87	18.14

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
3/1/2016	105.95	107.94	106.80	1.14	2.00
4/1/2016	94.64	112.21	112.24	-0.03	17.58
5/1/2016	105.01	104.43	104.79	-0.37	-0.58
6/1/2016	104.32	105.21	106.13	-0.91	0.89
7/1/2016	107.95	116.59	116.70	-0.11	8.64
8/1/2016	108.21	114.61	114.23	0.38	6.40
9/1/2016	118.96	117.73	117.13	0.61	-1.23
10/1/2016	115.92	117.79	117.87	-0.08	1.87
11/1/2016	181.94	128.16	126.85	1.31	-53.78
12/1/2016	138.64	117.57	117.29	0.28	-21.07
1/1/2017	105.49	119.53	120.81	-1.28	14.04
2/1/2017	100.26	121.98	121.06	0.93	21.72
3/1/2017	119.83	121.10	120.68	0.42	1.27
4/1/2017	97.28	117.02	117.32	-0.30	19.74
5/1/2017	128.64	123.81	122.90	0.91	-4.83
6/1/2017	121.43	122.21	121.62	0.59	0.78
7/1/2017	108.81	118.38	118.44	-0.06	9.57
8/1/2017	110.81	117.10	116.80	0.31	6.29
9/1/2017	115.51	117.96	117.79	0.17	2.45
10/1/2017	118.94	119.35	119.16	0.19	0.41
11/1/2017	163.38	116.00	116.29	-0.29	-47.39
12/1/2017	133.93	115.08	115.25	-0.17	-18.84
1/1/2018	112.77	129.33	128.36	0.96	16.56
2/1/2018	99.66	122.05	121.45	0.60	22.39
3/1/2018	117.19	121.00	120.41	0.59	3.81

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
4/1/2018	105.94	125.13	124.24	0.89	19.18
5/1/2018	133.52	126.21	125.23	0.99	-7.31
6/1/2018	124.47	126.15	125.28	0.87	1.69
7/1/2018	113.81	121.91	121.52	0.39	8.10
8/1/2018	120.56	126.02	125.54	0.47	5.46
9/1/2018	116.66	121.70	121.86	-0.16	5.03
10/1/2018	124.53	122.47	121.96	0.51	-2.06
11/1/2018	166.32	119.56	119.87	-0.31	-46.76
12/1/2018	151.07	128.27	127.68	0.60	-22.80
1/1/2019	96.87	113.45	113.27	0.18	16.58
2/1/2019	96.77	117.85	119.14	-1.30	21.08
3/1/2019	116.25	121.52	121.95	-0.43	5.26
4/1/2019	104.07	119.97	120.49	-0.52	15.91
5/1/2019	125.93	119.99	120.54	-0.55	-5.94
6/1/2019	117.23	120.00	120.58	-0.58	2.77
7/1/2019	113.98	120.02	120.63	-0.61	6.03
8/1/2019	113.26	120.03	120.67	-0.65	6.77
9/1/2019	117.20	120.04	120.72	-0.68	2.85
10/1/2019	122.26	120.06	120.76	-0.71	-2.20
11/1/2019	161.62	120.07	120.81	-0.74	-41.55
12/1/2019	146.12	120.08	120.85	-0.77	-26.04
1/1/2020	101.71	120.10	120.90	-0.80	18.38
2/1/2020	96.62	120.11	120.94	-0.83	23.49
3/1/2020	118.82	120.13	120.99	-0.86	1.31

**Table 11: ISIC31**

	<b>Original TS</b>	<b>Seasonally adjusted TS incl. calendar effects</b>	<b>Seasonally adjusted TS</b>	<b>Calendar effects (II-III)</b>	<b>Difference (II-I)</b>
<b>Data</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
1/1/2010	83.56	95.28	92.62	2.66	11.72
2/1/2010	95.45	97.16	95.79	1.37	1.71
3/1/2010	101.51	98.77	97.94	0.82	-2.74
4/1/2010	103.23	97.45	96.61	0.84	-5.78
5/1/2010	102.65	99.72	100.53	-0.81	-2.93
6/1/2010	98.61	98.14	97.83	0.30	-0.47
7/1/2010	99.06	100.57	100.46	0.11	1.51
8/1/2010	92.64	99.73	99.19	0.54	7.09
9/1/2010	100.10	102.01	101.56	0.45	1.91
10/1/2010	101.24	103.00	103.55	-0.55	1.76
11/1/2010	105.70	104.69	105.34	-0.65	-1.00
12/1/2010	116.26	107.98	109.16	-1.18	-8.28
1/1/2011	96.93	104.29	104.29	0.00	7.36
2/1/2011	107.19	106.73	107.04	-0.31	-0.46
3/1/2011	107.50	104.26	103.55	0.71	-3.23
4/1/2011	115.31	109.46	110.13	-0.67	-5.85
5/1/2011	110.35	105.48	106.33	-0.85	-4.87
6/1/2011	109.26	107.43	108.37	-0.94	-1.83
7/1/2011	102.43	106.36	106.76	-0.39	3.94
8/1/2011	99.78	105.08	104.13	0.95	5.30
9/1/2011	101.00	103.46	102.34	1.12	2.46
10/1/2011	103.46	106.49	106.33	0.16	3.03
11/1/2011	105.17	106.34	105.83	0.51	1.17
12/1/2011	109.86	106.93	105.99	0.93	-2.94



	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
1/1/2012	102.84	106.37	105.96	0.41	3.54
2/1/2012	109.23	109.17	108.88	0.29	-0.06
3/1/2012	111.69	109.51	109.39	0.12	-2.18
4/1/2012	110.00	105.78	105.07	0.71	-4.23
5/1/2012	114.87	111.18	110.05	1.13	-3.69
6/1/2012	106.75	108.65	108.82	-0.17	1.91
7/1/2012	106.62	108.77	109.62	-0.86	2.14
8/1/2012	107.66	109.26	110.47	-1.22	1.60
9/1/2012	110.09	112.26	114.06	-1.80	2.17
10/1/2012	111.12	108.63	109.31	-0.68	-2.49
11/1/2012	106.01	106.51	106.93	-0.42	0.50
12/1/2012	104.48	103.60	103.00	0.60	-0.89
1/1/2013	105.51	104.45	103.15	1.31	-1.06
2/1/2013	101.69	103.30	103.07	0.23	1.61
3/1/2013	104.09	104.30	103.39	0.91	0.21
4/1/2013	112.09	105.38	104.62	0.76	-6.71
5/1/2013	101.09	100.18	97.33	2.85	-0.91
6/1/2013	99.49	105.85	105.92	-0.07	6.37
7/1/2013	102.79	105.84	106.08	-0.23	3.06
8/1/2013	100.77	106.18	106.75	-0.57	5.41
9/1/2013	99.08	102.09	101.84	0.25	3.00
10/1/2013	103.56	103.99	103.33	0.66	0.43
11/1/2013	100.71	104.72	104.19	0.53	4.01
12/1/2013	110.75	104.77	104.91	-0.14	-5.98
1/1/2014	117.22	108.13	110.33	-2.20	-9.10

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
2/1/2014	104.44	104.71	105.40	-0.69	0.27
3/1/2014	108.47	105.33	106.14	-0.81	-3.13
4/1/2014	116.13	106.60	107.09	-0.49	-9.53
5/1/2014	110.49	107.46	107.15	0.31	-3.03
6/1/2014	93.72	101.65	99.90	1.75	7.93
7/1/2014	91.48	100.25	98.06	2.20	8.77
8/1/2014	89.48	100.80	99.77	1.03	11.32
9/1/2014	101.86	103.98	103.25	0.73	2.12
10/1/2014	100.56	101.76	101.10	0.66	1.20
11/1/2014	95.27	101.21	100.88	0.33	5.94
12/1/2014	117.51	106.12	108.10	-1.98	-11.39
1/1/2015	114.41	106.32	108.99	-2.67	-8.09
2/1/2015	97.23	98.43	98.13	0.30	1.20
3/1/2015	104.24	98.58	98.95	-0.37	-5.66
4/1/2015	119.96	112.12	110.98	1.14	-7.84
5/1/2015	98.78	95.69	95.84	-0.15	-3.09
6/1/2015	90.81	96.05	94.73	1.32	5.24
7/1/2015	87.27	94.99	93.90	1.09	7.72
8/1/2015	83.04	94.23	93.58	0.65	11.19
9/1/2015	89.64	91.87	90.93	0.94	2.24
10/1/2015	89.90	93.45	92.86	0.59	3.55
11/1/2015	89.17	93.15	92.64	0.51	3.98
12/1/2015	97.06	91.51	90.05	1.46	-5.55
1/1/2016	58.92	61.50	60.02	1.48	2.58
2/1/2016	65.73	67.19	66.44	0.75	1.46

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
3/1/2016	73.38	66.16	65.36	0.80	-7.23
4/1/2016	71.50	65.44	64.65	0.79	-6.06
5/1/2016	73.49	66.47	66.22	0.25	-7.02
6/1/2016	64.20	66.61	67.04	-0.43	2.41
7/1/2016	58.91	69.19	69.19	0.00	10.28
8/1/2016	64.52	69.78	70.07	-0.29	5.26
9/1/2016	72.52	72.24	72.86	-0.62	-0.27
10/1/2016	67.07	71.06	71.93	-0.87	4.00
11/1/2016	71.70	72.66	72.47	0.19	0.97
12/1/2016	72.12	69.59	68.10	1.49	-2.53
1/1/2017	67.23	69.74	68.59	1.15	2.51
2/1/2017	68.29	71.07	69.82	1.25	2.78
3/1/2017	83.00	74.44	74.72	-0.28	-8.56
4/1/2017	81.36	75.25	76.15	-0.90	-6.11
5/1/2017	89.29	76.92	77.72	-0.80	-12.37
6/1/2017	73.19	75.28	75.19	0.09	2.08
7/1/2017	62.27	72.98	72.40	0.58	10.71
8/1/2017	67.10	74.43	73.57	0.86	7.33
9/1/2017	70.70	74.51	74.10	0.40	3.80
10/1/2017	72.10	76.33	75.95	0.37	4.23
11/1/2017	74.42	75.40	75.61	-0.21	0.98
12/1/2017	81.35	78.25	78.43	-0.18	-3.10
1/1/2018	76.44	76.23	74.96	1.27	-0.21
2/1/2018	77.24	78.46	77.97	0.49	1.22
3/1/2018	82.91	77.66	77.30	0.36	-5.25

	Original TS	Seasonally adjusted TS incl. calendar effects	Seasonally adjusted TS	Calendar effects (II-III)	Difference (II-I)
Data	I	II	III	IV	V
4/1/2018	84.86	78.44	78.10	0.33	-6.42
5/1/2018	91.35	79.81	79.94	-0.13	-11.54
6/1/2018	74.00	78.21	77.91	0.30	4.21
7/1/2018	72.10	79.20	79.06	0.13	7.09
8/1/2018	70.73	77.77	77.11	0.66	7.04
9/1/2018	72.40	79.06	78.52	0.54	6.66
10/1/2018	73.90	77.71	76.56	1.15	3.81
11/1/2018	76.58	78.53	78.24	0.28	1.95
12/1/2018	85.41	81.29	81.87	-0.58	-4.13
1/1/2019	85.08	81.67	82.28	-0.61	-3.41
2/1/2019	80.40	79.03	80.32	-1.29	-1.37
3/1/2019	83.08	80.22	80.27	-0.05	-2.86
4/1/2019	86.90	79.55	79.67	-0.13	-7.35
5/1/2019	86.69	79.18	79.25	-0.07	-7.50
6/1/2019	73.30	78.90	78.90	0.00	5.59
7/1/2019	75.22	78.67	78.61	0.06	3.45
8/1/2019	70.99	78.48	78.36	0.12	7.49
9/1/2019	74.37	78.31	78.15	0.16	3.94
10/1/2019	75.11	78.17	77.97	0.20	3.06
11/1/2019	73.09	78.05	77.82	0.23	4.96
12/1/2019	82.88	77.93	77.69	0.24	-4.94
1/1/2020	80.91	77.83	77.57	0.25	-3.08
2/1/2020	76.68	77.73	77.47	0.26	1.05
3/1/2020	82.56	77.64	77.38	0.25	-4.92



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna International Centre · P.O. Box 300 9 · 1400 Vienna · Austria  
Tel.: (+43-1) 26026-0 · E-mail: [info@unido.org](mailto:info@unido.org)  
[www.unido.org](http://www.unido.org)