

Indirect Seasonal Adjustment Application of Chained Indices for Türkiye

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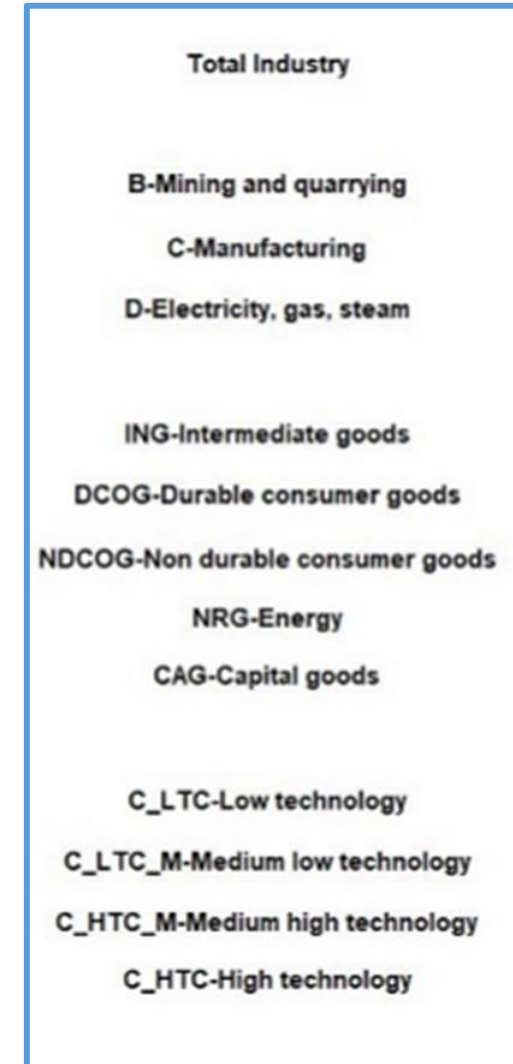
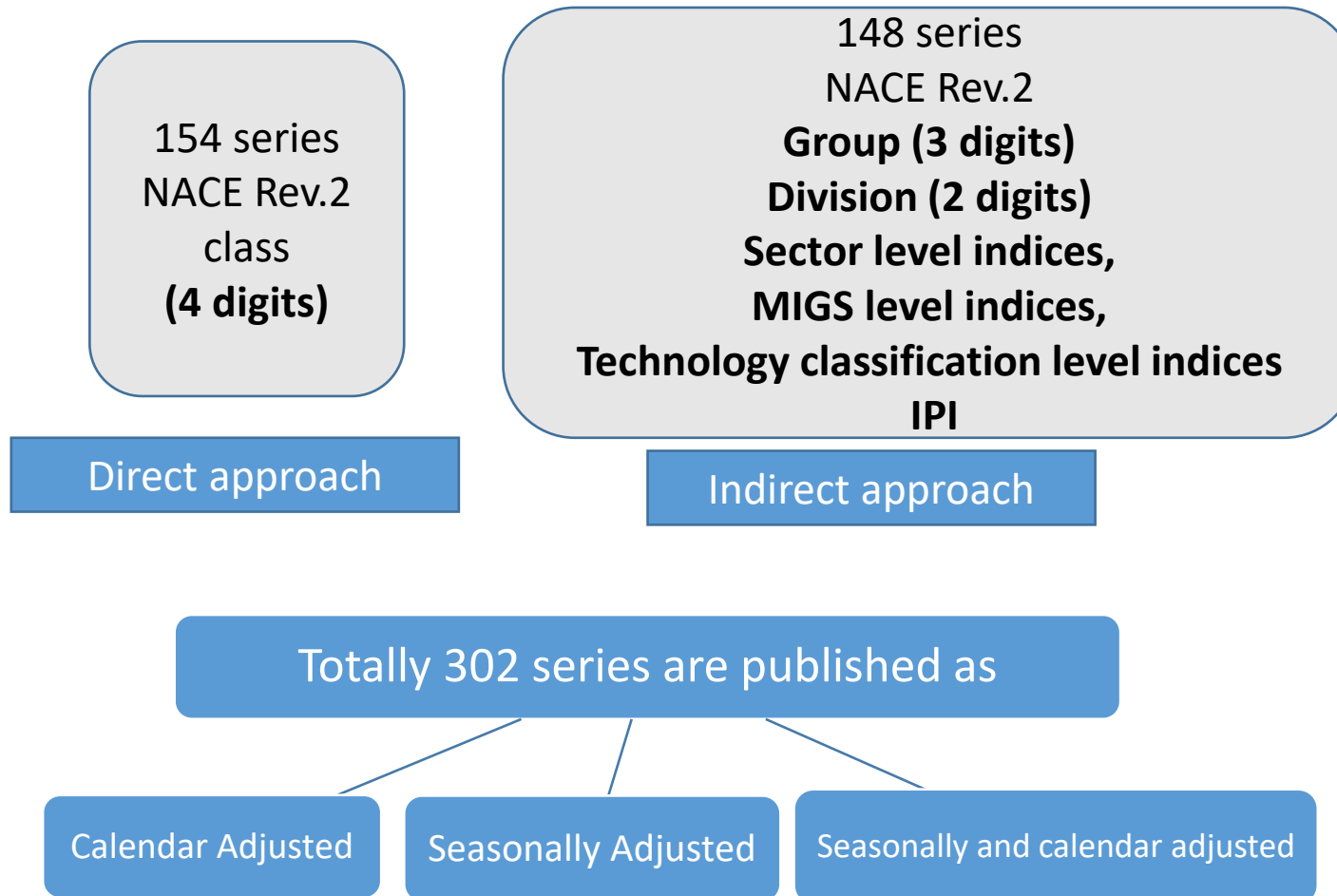
Industrial Production Index

- “Industrial Production Index” is calculated in order to measure the positive or negative effects of the developments in the industrial part of the economy and the economic policies implemented in the short term.
- Scope of the Data:
 - Mining and Quarrying Sector (B),
 - Manufacturing industry (C)
 - Electricity, Gas, Steam and Air Conditioning Supply (D) classified in NACE Rev.2
- Calculation Method:
 - Chained Laspeyres Index Method (weighted)
- Data Sources:
 - Monthly Industrial Production Questionnaire,
 - The turnover information calculated from the data of the Revenue Administration
- Surveys are conducted with around 7000 enterprises, which corresponds to approximately 60% of the sector size. The information of other enterprises in the sector is obtained from administrative records.
- Calculation of Contributions

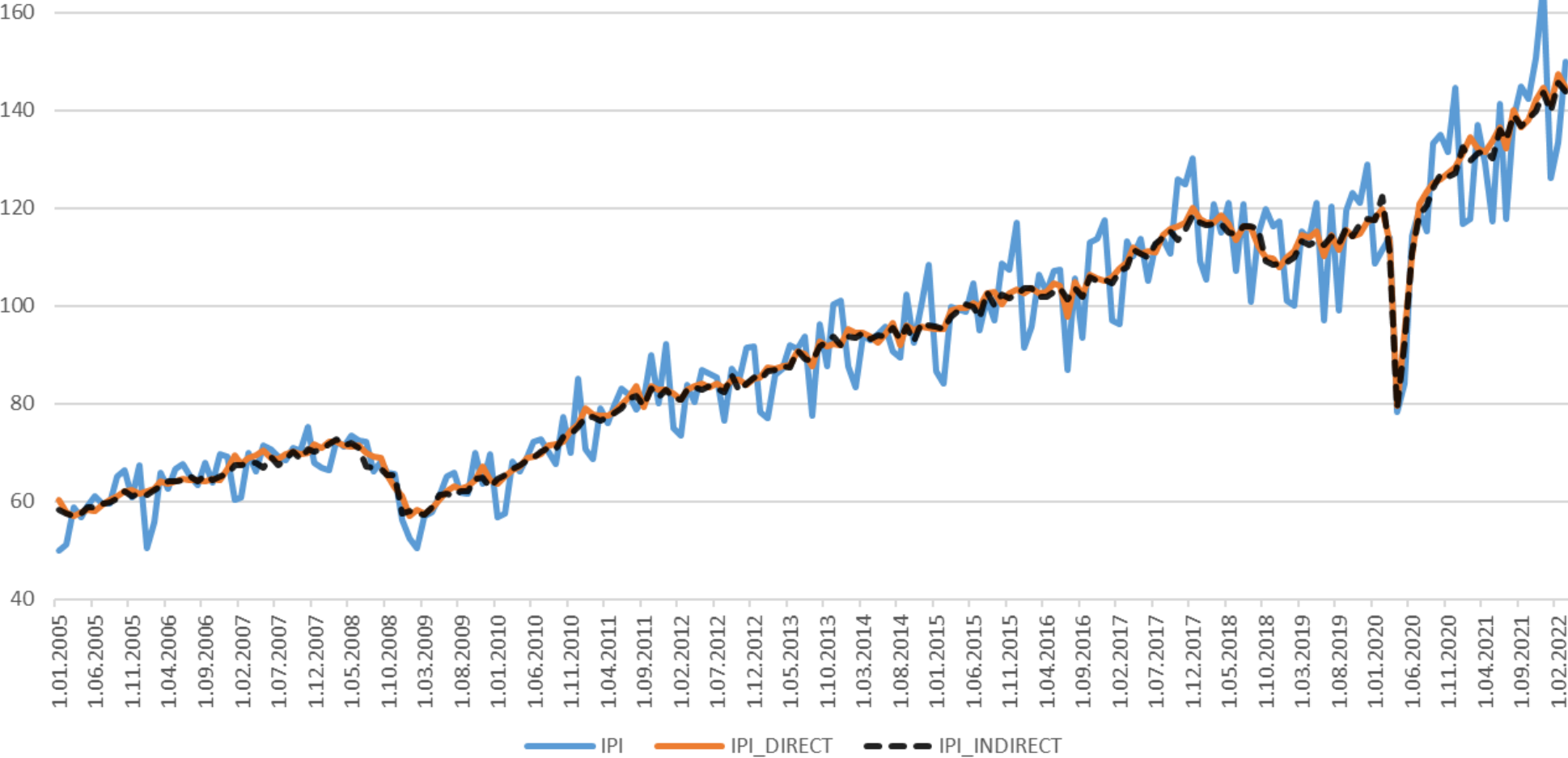
The contribution of the indices to the change of the upper index compared to the previous year is calculated for NACE Rev.2 two digit and MIGS series.

The Seasonal Adjustment of Industrial Production Index (IPI)

- TRAMO-SEATS methodology
- JDemetra+ 2.2.2

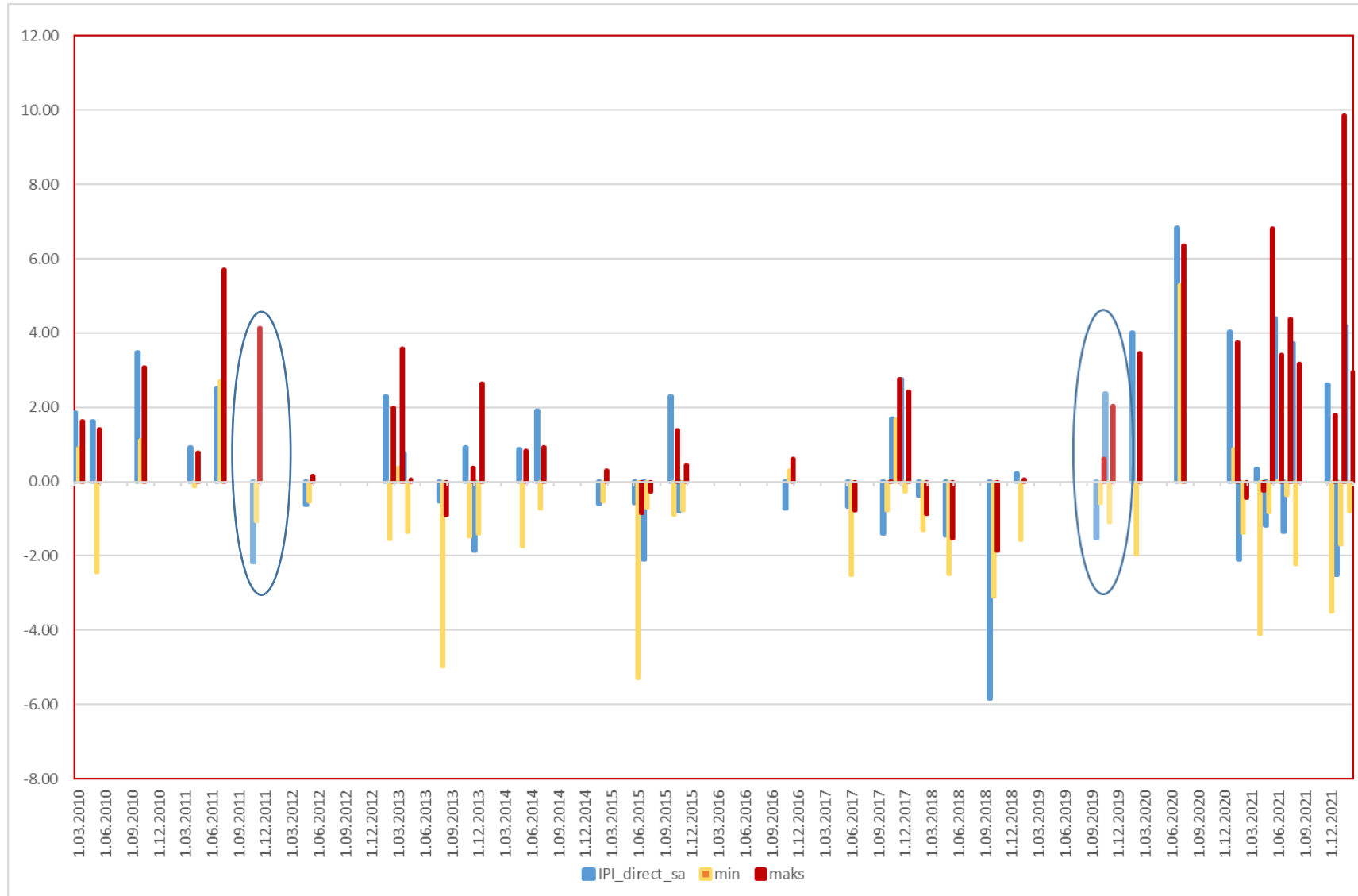


Direct/ Indirect Seasonal Adjustment

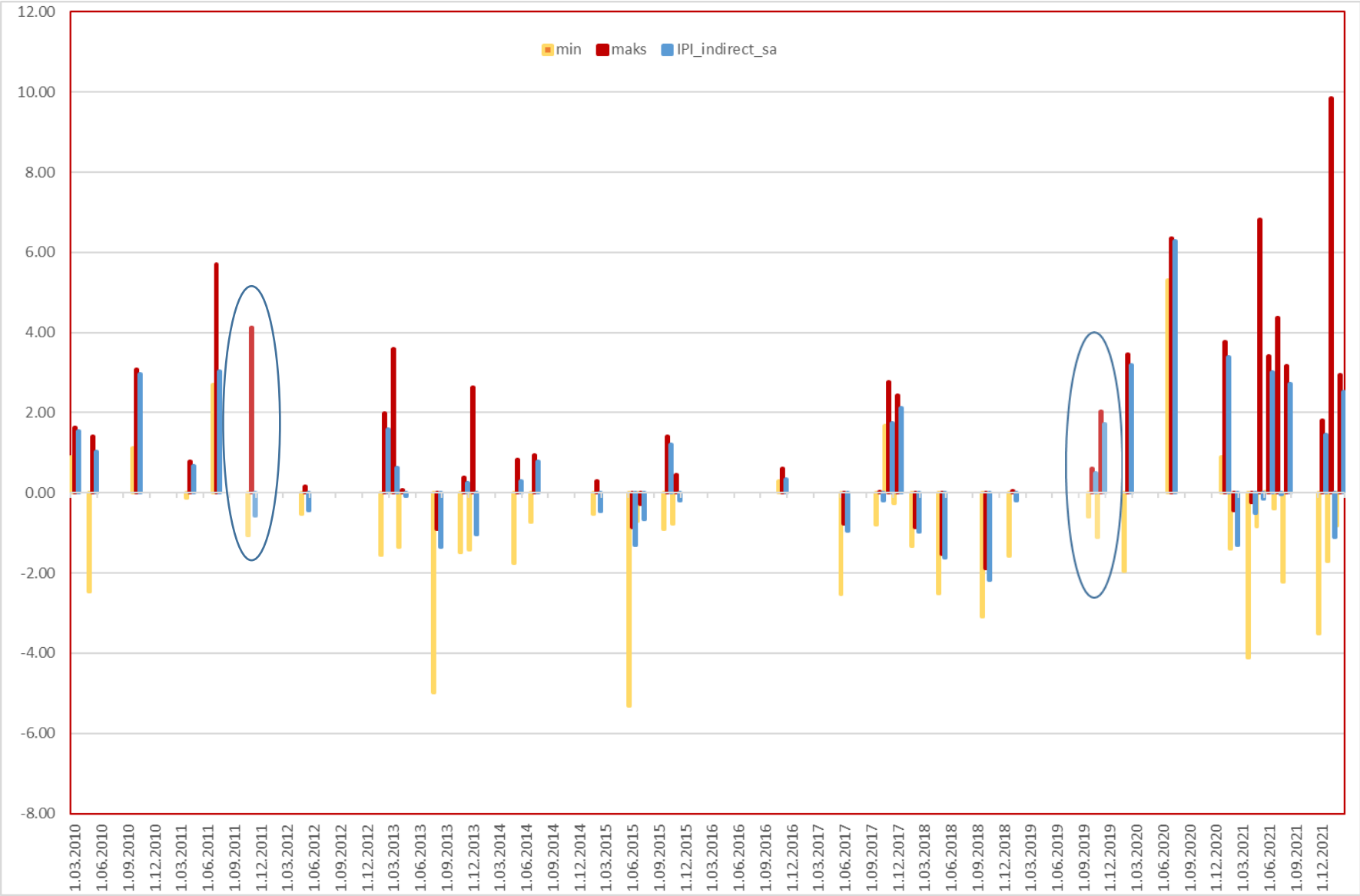


Industrial Production Index (2015=100)

Direct Seasonal Adjustment of IPI



Indirect Seasonal Adjustment of IPI



Indirect Seasonal Adjustment for Chained Indices

- In mathematical terms, the construction of the production indices by Laspeyres annual chain linking method is as follows ('Information Paper On Chain Linking Of Monthly Index Of Industrial Production (2019 = 100)' Economic Development Board (EDB), Singapore, 2021)

\bar{q}_{t-1}^i : be the **average** quantity of the i^{th} commodity, produced in the year $t-1$

$q_{t,m}^i$: be the quantity of the i^{th} commodity, produced in the month m of current year t

1

For month m of current year t

$Q_{t,m}^i = \frac{q_{t,m}^i}{\bar{q}_{t-1}^i}$: is the quantity of the i^{th} commodity, produced in the month m of current year t relative to the **average** quantity produced in the previous year

2

$$Q_{t,m}^j = \sum_i^{n_i} W^i Q_{t,m}^i$$

$Q_{t,m}^j$ is the monthly unchained index of the j^{th} industry (at NACE 3-digit level)

W^i is the weight of the i^{th} commodity within the j^{th} industry, which has n_i commodities

3

$$Q_{t,m}^k = \sum_j^{n_j} W^j Q_{t,m}^j$$

$Q_{t,m}^k$ is the monthly unchained index of the k^{th} industry division (at NACE 2-digit level)

W^j is the weight of the j^{th} industry within the k^{th} industry division, which has n_j industries

4

Indirect Seasonal Adjustment for Chained Indices

$$Q_{t,m}^{tot} = \sum_i^{n_k} W^k Q_{t,m}^k$$

$Q_{t,m}^{tot}$ is the monthly unchained index at the total manufacturing level

W^k is the weight of the k^{th} industry division within the manufacturing sector, which is divided into n_k industry divisions (B,C,D) – (ING,DCOG,NDCOG,NRG,CAG) – (C_LTC,C_LTC_M, C_HTC_M,C_HTC)

5

To derive the monthly chained index for each industry, industry division and total manufacturing:

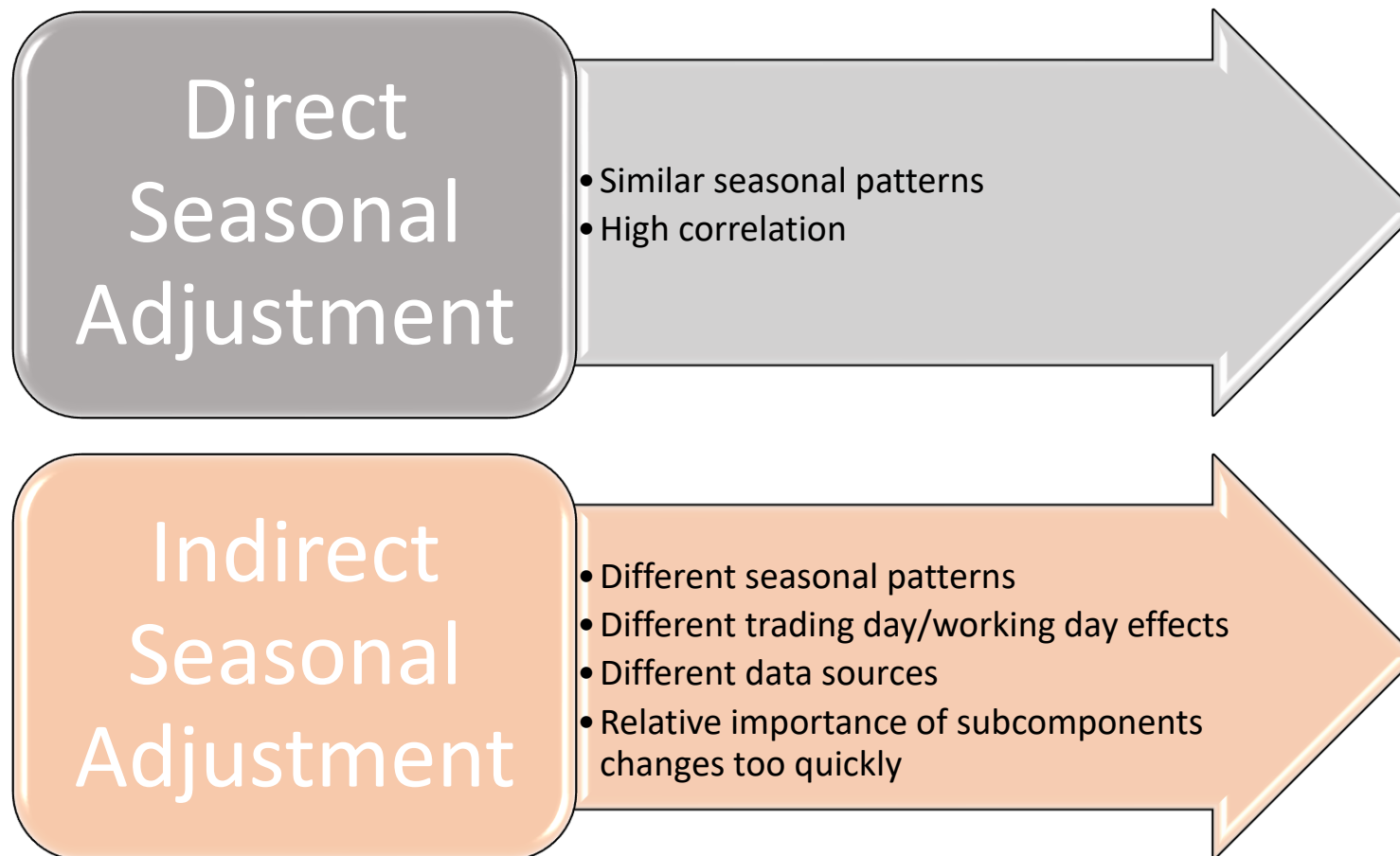
$$I_{t,m}^{j_k_{tot}} = Q_{t,m}^{tot} \times I_{t-1}^{j_k_{tot}}$$

$I_{t,m}^{j_k_{tot}}$ is the monthly chained index of the j^{th} industry, k^{th} industry division or total manufacturing

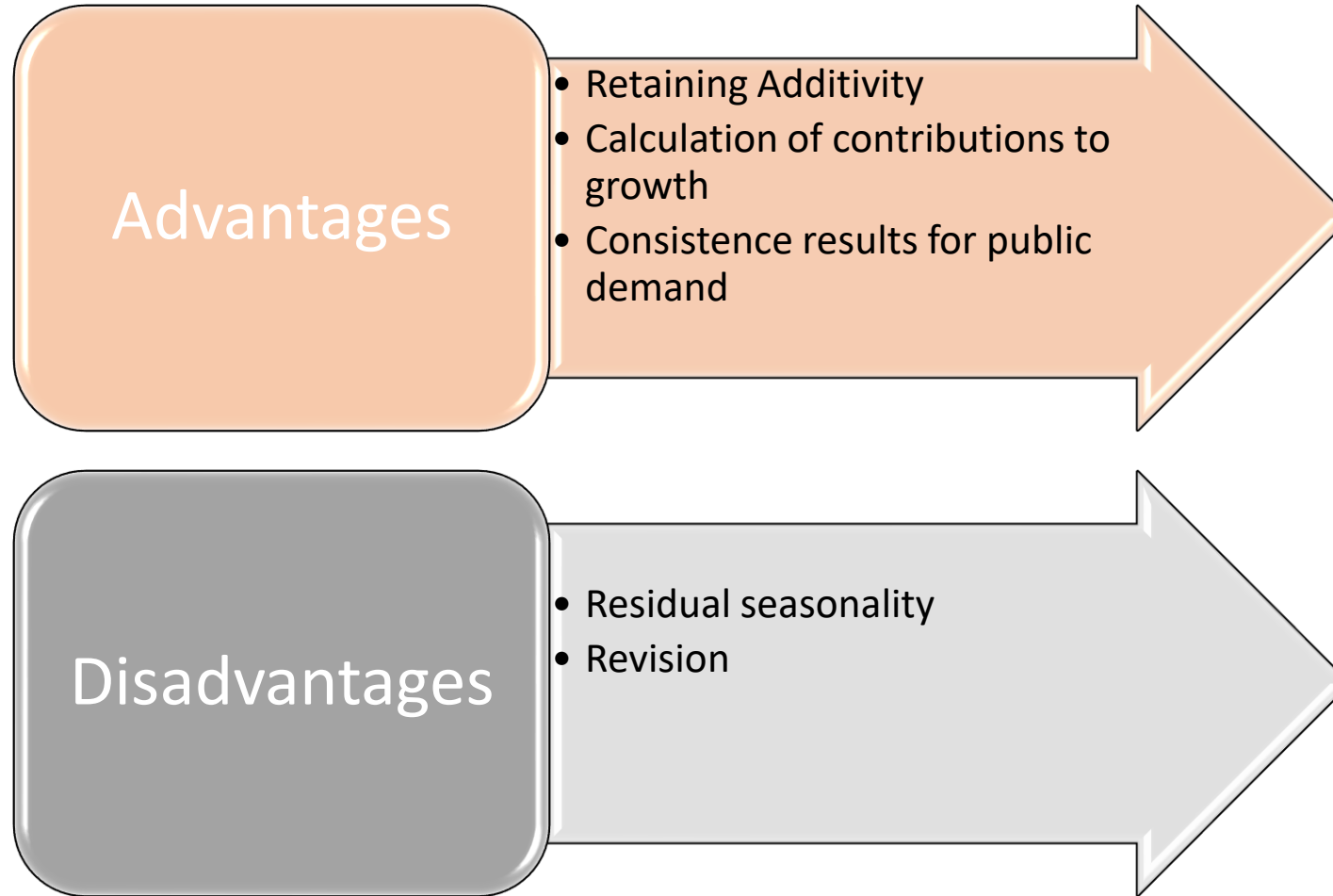
$I_{t-1}^{j_k_{tot}}$ is the annual chained index of the j^{th} industry, k^{th} industry division or total manufacturing in the previous year

6

Direct or Indirect Approach ?



The advantages and disadvantages of indirect approach



Sources

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Thank you !

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