1. STATIC CONCENTRATION INDEXES:

Call s_i the market share of firm i, where $s_i = q_i/Q$ for $i = 1, ..., n$.
Then, the following **static** concentration indexes are usually calculated:

- **R(k) concentration index:** For a set of firms $i \leq k < n$, $R(k, s) = \sum_{i=1}^{k} s_i$. Observe that it is related to the concentration curve of a subset of firms. In many cases it is used as an indicator of monopoly power $(k = 1)$ or duopoly power $(k = 2)$ of the largest operators.

- **HHI Herfindahl-Hirschman index**: It is defined as the sum of the squared market shares of all the firms in the market: $HHI(s) = \sum_{i=1}^{n} s_i^2$. Its popularity stems from the fact that can be linked to distributional theory where $HHI(s)$ is defined in terms of the moments of the underlying industry size distribution. For instance see Adelman (1969) and Kwoka (1985)

$$
\begin{aligned}
HHI(s) &= \frac{1}{n} + \sum_{i=1}^{n} \left(s_i - \frac{1}{n} \right)^2, \\
HHI(s) &= \frac{1}{n} + n\sigma^2, \\
HHI(s) &= \frac{1 + \nu^2}{n},
\end{aligned}
$$

where σ is the standard deviation of the distribution and ν is the coefficient of variation.

- **HTI Hall-Tideman concentration index**: Hall and Tideman (1967) propose an index that assigns to the ith largest firm the weight i thus weighing each share by its rank rather than its relative share. Hence the function

$$
HTI(s) = \frac{1}{2 \sum_{i=1}^{n} i s_i - 1}.
$$

The $HTI(s)$ ranges between zero and unity.

- **EI entropy index**: This index has its foundations in information theory and measures the ex-ante expected information content of a certain distribution. Entropy was introduced to economics by Theil (1967) as a measure of industry concentration. Related to the general form of concentration indexes, if $w_i = -\log s_i$ for all firms, then we obtain

$$
EI(s) = -\sum_{i=1}^{n} s_i \ln s_i.
$$

- **EXP exponential index**: It is defined as the product of the market shares to their own power,

$$
EXP(s) = \prod_{i=1}^{n} s_i^{s_i}
$$

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■ **CCI index:** The Comprehensive Industrial Concentration index proposed by Horwath (1970) seeks to combine concentration and dispersion. is defined as,

$$CCI = s_1 + \sum_{i=2}^{n} s_i^2 \left(1 + (1 - s_i)\right)$$

An extension of the CCI index to large markets where it can be expected market dominance by k firms is,

$$CCI_k = R\left(k, s\right) + \sum_{i=1+k}^{n} s_i^2 \left(1 + (1 - s_i)\right)$$

2. DYNAMIC CONCENTRATION INDEXES:

Call s_i the market share of firm i, where $s_i = q_i/Q$ for $i = 1, ..., n$. Then, the following **dynamic** concentration index is usually calculated:

■ **Instability index:** It allows to consider entry and exit of firms.

$$I_t = 0.5 \sum_{i=1}^{n} \text{abs}(s_{it} - s_{it\text{-}1})$$

I=0 maximum stability, minimum instability.
I=1 minimum stability, maximum instability.