



## ABC Analysis

### Overview

In the big companies, an efficient and effective item management requires careful attention in the classification of groups, each of them could be organized on the basis of different management and control policies. ABC analysis is the most used method to classify the items into three groups (A,B,C), in order of importance.

The following parameters are considered for each item:

- Total consumption during the reference period [*pieces/period*]
- Unit value in the reference period [*€/pieces*]

Based on these parameters the usage value of an item is determined as :

$$VI_k = q_k \cdot v_k \text{ [€/period]}$$

The items are listed on their usage value in decreasing order. This list allows to define the total accumulated value:

$$VC_k = \sum_{i \leq k} VI_i \text{ [€/period]}$$

The percentage of the total accumulated value of the items is calculated by the following relation:

$$VC_k \% = \frac{VC_k}{VC_n} \%$$

Where  $VC_n$  is the total usage value, the sum of the usage value of  $n$  items.

The introduction of threshold values for the division of the groups are:  $v_A = 80\%$  ,  $v_B = 90\%$ . According to this selection, the items which hold a value less than or equal to 80%, compose group A; while group B is composed by those items whose cumulative value lies between 80%-90%. Ultimately, the remaining items compose group C. This breakdown is not obligatory, you can chose the percentage of each group based on the state of the discriminatory variable.

### Example

Considering the data illustrated in table below, an ABC analysis can be performed adopting as thresholds for each group the following limit values:  $v_A = 80\%$  ,  $v_B = 90\%$ .

| Item                                | A   | B  | C   | D  | E   | F  | G   | H  | I  | L  |
|-------------------------------------|-----|----|-----|----|-----|----|-----|----|----|----|
| <b>Consumption</b><br>[pieces/year] | 40  | 30 | 50  | 20 | 8   | 20 | 10  | 40 | 10 | 5  |
| <b>Unit value</b> [€/pieces]        | 350 | 30 | 200 | 70 | 100 | 20 | 100 | 20 | 60 | 20 |

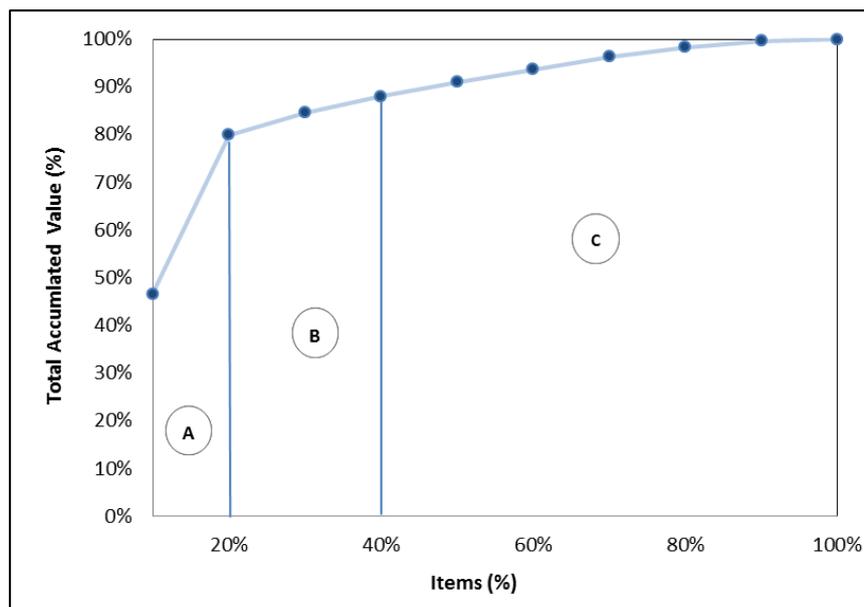
A calculation of usage value of items can be obtained through these figures.

| Item | Consumption<br>[pieces/year] | Unit value<br>[€/pieces] | Usage value<br>[€/year] |
|------|------------------------------|--------------------------|-------------------------|
| A    | 40                           | 350                      | 14000                   |
| B    | 30                           | 30                       | 900                     |
| C    | 50                           | 200                      | 10000                   |
| D    | 20                           | 70                       | 1400                    |
| E    | 8                            | 100                      | 800                     |
| F    | 20                           | 20                       | 400                     |
| G    | 10                           | 100                      | 1000                    |
| H    | 40                           | 20                       | 800                     |
| I    | 10                           | 60                       | 600                     |
| L    | 5                            | 20                       | 100                     |

The items can be structured in a diminishing order through their usage value. A calculation of the total accumulated value and the percentage of this value can be obtained on the basis of the previous relation.

| Item | Usage value<br>[€/year] | Total accumulated<br>value<br>[€/year] | Total accumulated<br>value<br>% |
|------|-------------------------|--|---------------------------------|
| A    | 14000                   | 14000                                  | 46,7%                           |
| C    | 10000                   | 24000                                  | 80,0%                           |
| D    | 1400                    | 25400                                  | 84,7%                           |
| G    | 1000                    | 26400                                  | 88,0%                           |
| B    | 900                     | 27300                                  | 91,0%                           |
| H    | 800                     | 28100                                  | 93,7%                           |
| E    | 800                     | 28900                                  | 96,3%                           |
| I    | 600                     | 29500                                  | 98,3%                           |
| F    | 400                     | 29900                                  | 99,7%                           |
| L    | 100                     | 30000                                  | 100%                            |

Subsequently, an evaluation of the results and the classification of items into three groups can be carried out. A graphical representation of the analysis is shown below. The axes of the representation of the coordinate system are: the items and the total percentage of the accumulated usage value.



According to these values:  $v_A = 80\%$  and  $v_B = 90\%$ , the items belonging to group A are almost 20%, another 20% constitute group B and almost 60% of items are part of group C. A summary of the analysis is shown in following table.

| Category | Item        |
|----------|-------------|
| Class A  | A-C         |
| Class B  | D-G         |
| Class C  | B-H-E-I-F-L |