

## 4.14. ABC analysis

Streamline can perform one- or two-dimensional ABC analysis based on:

- [sold unit amount](#) – the number of units sold;
- [revenue](#) -- the revenue gained by selling the item;
- [gross profit](#) -- the gross profit obtained as a difference between the revenue and the item value in stock;
- [cost of goods sold \(COGS\)](#); and
- [inventory value](#) -- the balance value of the item in stock.

In this article we:

- describe the ABC analysis [capabilities](#) in Streamline,
- show how to [explore the results](#) of the ABC analysis, and
- give some [details](#) on how Streamline makes the calculations.

### One-dimensional Analysis

One-dimensional ABC analysis consists in the division of all SKUs (items) into three categories or classes, A, B, and C, based on the given criteria. Class A includes items making up the lion's share of the total criterion value – these are the “best” items in terms of this criterion. Items of classes B and C share the rest of the total.

To perform the analysis, the user should set up three things:

- the characteristic (or variable) that is used as the criterion,
- the number of classes, and
- the share of the total criterion value for each class in percentage.

Typically, class A takes 70% of the total criterion value, class B – 20%, and class C – 10%.

For example, A-items with the highest revenue make up for 70% of the annual revenue in the revenue-based analysis. Streamline allows for adjusting the share for each class as well as the number of classes.

### Two-dimensional Analysis

Streamline allows you to activate an additional axis in the ABC analysis and divide the items into classes based on two criteria. For instance, you need to analyze your items from two points of view simultaneously and find those that generate the highest revenue and gross profit, or are the most saleable and profitable at once. Streamline enables you to set up the number of classes and class shares for both axes.

# Exploring ABC Analysis

To perform ABC analysis in Streamline, specific types of data should be imported as described below.

## Necessary Data

Necessary data for each type of ABC analysis is shown in the table below.

Analysis type	Data
Unit-based	Sales history, typically always imported.
Revenue-based	Revenue history or current selling price.
Gross profit-based	Sales price/unit (or Transaction revenue) and inventory value (or item purchase price).
COGS-based	Inventory value or item purchase price.
Inventory value-based	

The item purchase price indicated in the table can be only used if its currency coincides with the project base currency.

### Unit-based

You do not have to provide any additional data to enable Streamline to perform unit-based ABC analysis. Streamline uses the basic sales history data, for the calculations. Thus, this kind of analysis can be explored by default.

### Revenue-based

Different data representing an item revenue history should be provided depending on Streamline's data connection.

In the **Aggregated spreadsheet connection** the revenue history can be [imported directly](#) using Excel files. If you can't provide it, the analysis can be carried out based on the [sales price/unit](#) as a reasonable substitute.

To import the revenue history using the [Transactional spreadsheet connection](#) or [Database connection](#), you should provide the selling price for a single sales transaction or the selling price of one unit in this transaction in your data.

### Gross Profit-based

For a Gross profit-based analysis, if you import data through **Transactional spreadsheet connection** or **Database connection**, you should provide:

- the **sales price/unit** or **Transaction revenue** in the sales transactions history, and
- the [inventory value/unit](#) (preferred) or the **item purchase price**.

If you use the **Aggregated spreadsheet connection**, Streamline requires:

- the [sales price/unit](#), and
- either the [inventory value/unit](#), **inventory value**, or the **item purchase price** if its currency

coincides with the project currency.

**Inventory value/unit** or **inventory value** is preferable to **item purchase price** in this case.

### COGS-based and Inventory value-based

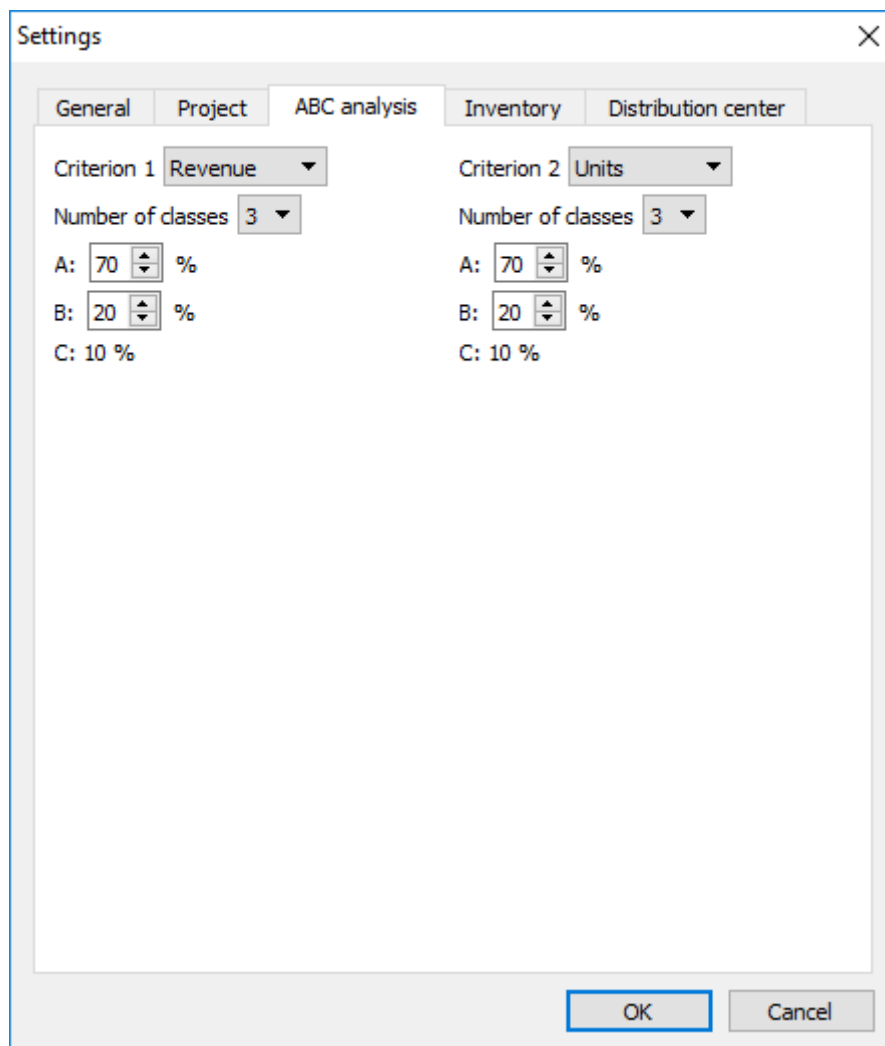
Streamline requires you to provide either the **inventory value/unit**, **inventory value**, or the **item purchase price** if you use the **Aggregated spreadsheet connection**. In this case, the **inventory value/unit** or **inventory value** is preferred.

If you import data using **Transactional spreadsheet connection** or **Database connection**, you should provide the **inventory value/unit** (preferred) or the **item purchase price**.

## Configuring Parameters of Analysis

Streamline performs the revenue-based ABC analysis if there is enough data otherwise, the unit-based type is performed.

To set up the parameters of the analysis such as the number of dimensions, the criteria for each dimension, and other, go to the menu **File > Settings > ABC analysis** tab (see figure below).



The **Criterion 1** control defines the criterion for the first dimension and **Criterion 2** for the second

one. If **Criterion 2** is set to **None**, the one-dimensional ABC analysis will be performed. Otherwise, Streamline carries out the two-dimensional ABC analysis. The controls below the criteria set the number of classes and the percentages for each class. The percentage for the last class is calculated automatically.

To perform the two-dimensional ABC analysis based on the revenue and sold quantities, configure the ABC settings as shown in the figure above.

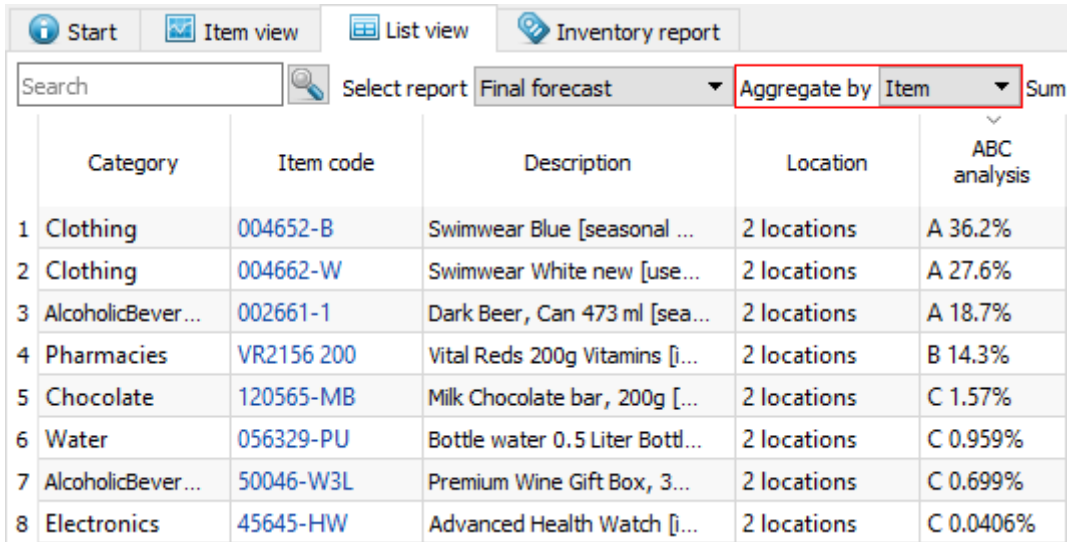
## Analysis Reports

A result of ABC analysis can be viewed on the **Reports** tab by the **ABC analysis** column of the table (see figure below).

	Category	Item code	Description	Location	ABC analysis
1	Clothing	004652-B	Swimwear Blue [seasonal ...	East	A 22.6%
2	Clothing	004662-W	Swimwear White new [use...	East	A 17.3%
3	AlcoholicBever...	002661-1	Dark Beer, Can 473 ml [sea...	East	A 13.6%
4	Clothing	004652-B	Swimwear Blue [seasonal ...	West	A 13.6%
5	Clothing	004662-W	Swimwear White new [use...	West	A 10.4%
6	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [i...	East	B 7.6%
7	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [i...	West	B 6.66%
8	AlcoholicBever...	002661-1	Dark Beer, Can 473 ml [sea...	West	C 5.03%
9	Chocolate	120565-MB	Milk Chocolate bar, 200g [...	East	C 0.982%

To find which items belong to the particular class quickly, sort the table by clicking on the column header. The **ABC analysis** column is shown regardless of the report selected in the **Select report** control.

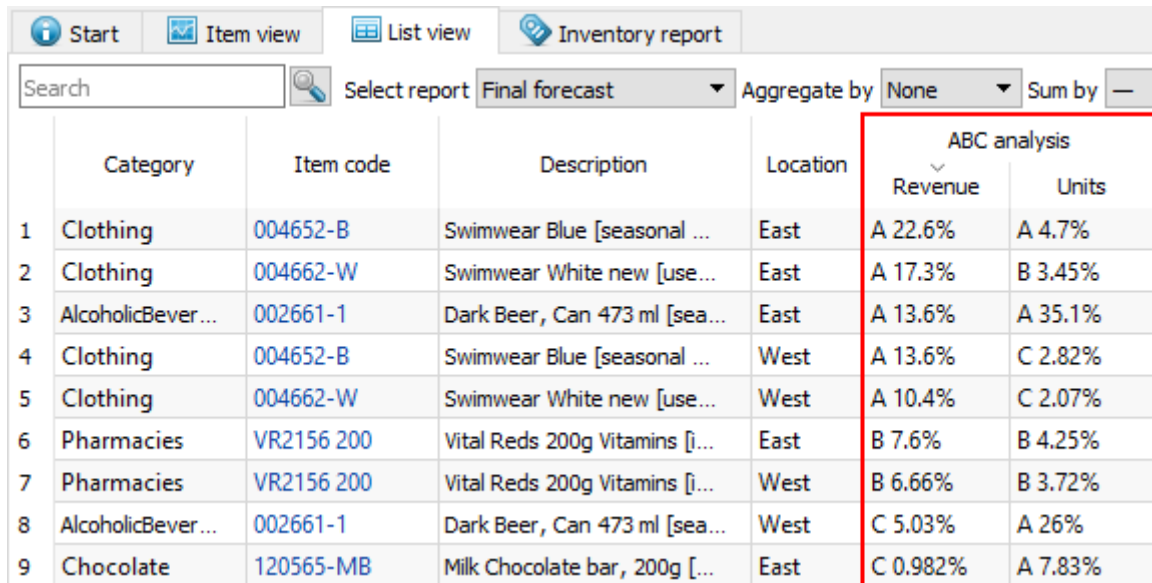
The report shows information at the lowest level of detail, the **planning item** level by default. To see it at the SKU level (if locations are used), choose the **Item** option in the **Aggregate by** control (see the figure below).



The screenshot shows a software interface with a top navigation bar containing 'Start', 'Item view', 'List view', and 'Inventory report'. Below the navigation bar is a search field and a 'Select report' dropdown menu set to 'Final forecast'. To the right, there is an 'Aggregate by' dropdown menu set to 'Item' and a 'Sum' dropdown menu. The main table displays an ABC analysis with the following columns: Category, Item code, Description, Location, and ABC analysis. The data is as follows:

	Category	Item code	Description	Location	ABC analysis
1	Clothing	004652-B	Swimwear Blue [seasonal ...	2 locations	A 36.2%
2	Clothing	004662-W	Swimwear White new [use...	2 locations	A 27.6%
3	AlcoholicBever...	002661-1	Dark Beer, Can 473 ml [sea...	2 locations	A 18.7%
4	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [i...	2 locations	B 14.3%
5	Chocolate	120565-MB	Milk Chocolate bar, 200g [...	2 locations	C 1.57%
6	Water	056329-PU	Bottle water 0.5 Liter Bottl...	2 locations	C 0.959%
7	AlcoholicBever...	50046-W3L	Premium Wine Gift Box, 3...	2 locations	C 0.699%
8	Electronics	45645-HW	Advanced Health Watch [i...	2 locations	C 0.0406%

In the case of the two-dimensional analysis, the **ABC analysis** column has two sub-columns with an indication of the criteria used. There are two criteria in our example, the revenue and quantity of sold units (see figure below).

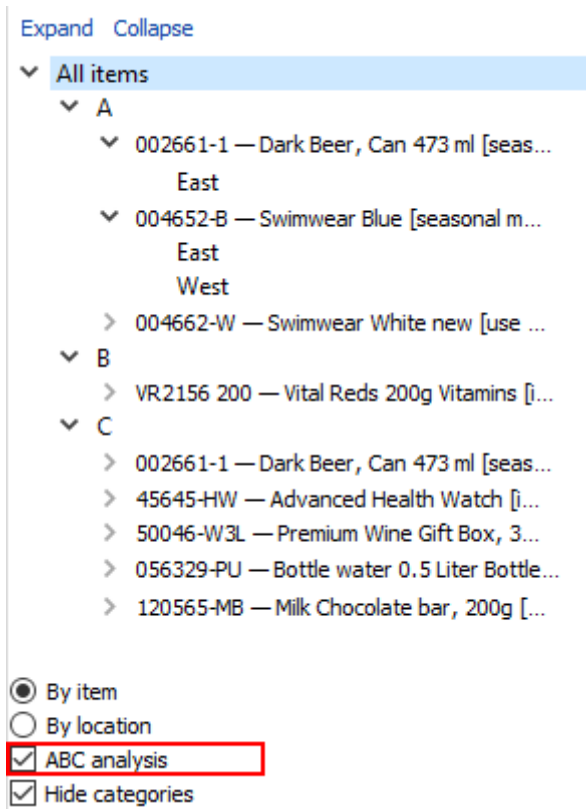


The screenshot shows a software interface with a top navigation bar containing 'Start', 'Item view', 'List view', and 'Inventory report'. Below the navigation bar is a search field and a 'Select report' dropdown menu set to 'Final forecast'. To the right, there is an 'Aggregate by' dropdown menu set to 'None' and a 'Sum by' dropdown menu set to '—'. The main table displays a two-dimensional ABC analysis with the following columns: Category, Item code, Description, Location, and ABC analysis. The ABC analysis column is further divided into 'Revenue' and 'Units' sub-columns. The data is as follows:

	Category	Item code	Description	Location	ABC analysis	
					Revenue	Units
1	Clothing	004652-B	Swimwear Blue [seasonal ...	East	A 22.6%	A 4.7%
2	Clothing	004662-W	Swimwear White new [use...	East	A 17.3%	B 3.45%
3	AlcoholicBever...	002661-1	Dark Beer, Can 473 ml [sea...	East	A 13.6%	A 35.1%
4	Clothing	004652-B	Swimwear Blue [seasonal ...	West	A 13.6%	C 2.82%
5	Clothing	004662-W	Swimwear White new [use...	West	A 10.4%	C 2.07%
6	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [i...	East	B 7.6%	B 4.25%
7	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [i...	West	B 6.66%	B 3.72%
8	AlcoholicBever...	002661-1	Dark Beer, Can 473 ml [sea...	West	C 5.03%	A 26%
9	Chocolate	120565-MB	Milk Chocolate bar, 200g [...	East	C 0.982%	A 7.83%

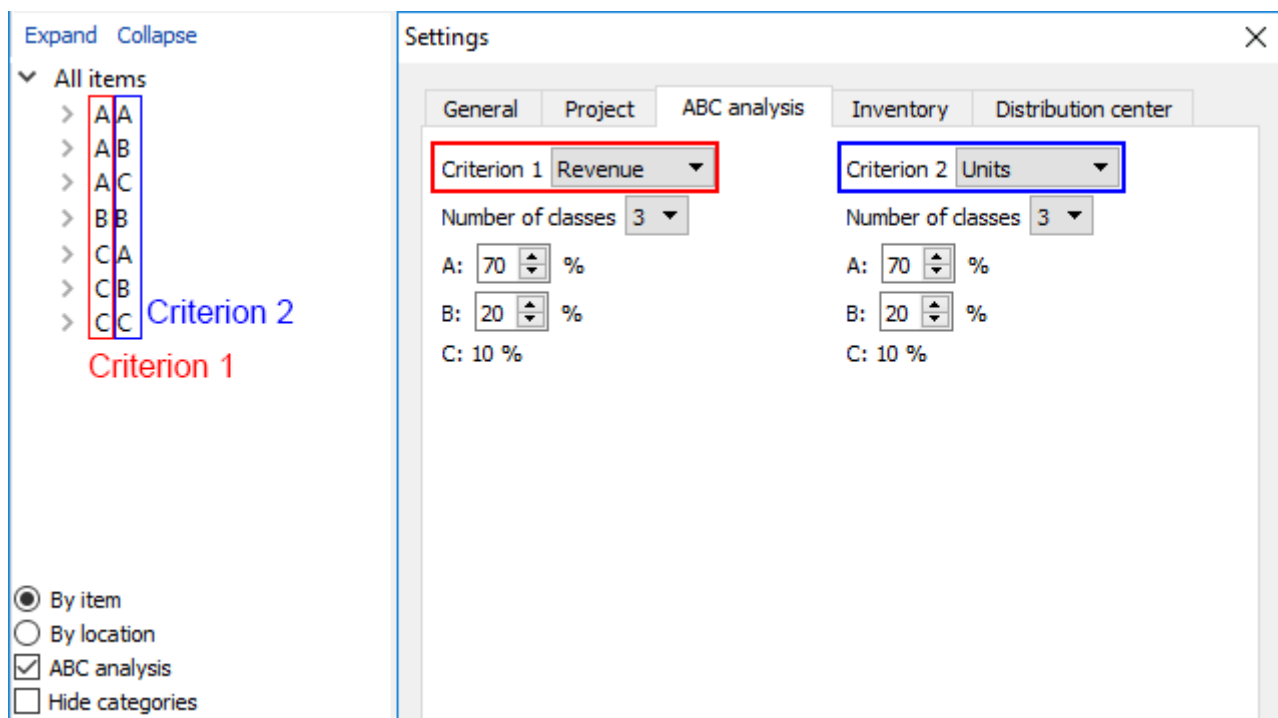
The first criterion is always depicted in the first sub-column and the second criterion, in the second sub-column.

A result of ABC analysis can be also viewed on the **Demand forecasting** tab. To show it, check the **ABC analysis** option at the bottom of the **Tree view**. This will add the ABC classification under the **All items** node of the tree (see figure below).



The **Hide categories** option below the **ABC analysis** check-box is very handy in this case. It allows you to hide all the categories and sub-categories of your items so that the tree shows only planning items and corresponding ABC classes.

If you use two criteria in ABC analysis, the **Tree view** shows only the resulting combinations of classes. In our example, the **BA** and **BC** combinations are absent because they don't have items with those combinations. The first letter of the combination relates to the **Criterion 1** and the second, to the **Criterion 2** (see figure below).



The **ABC analysis** option in the **Tree view** also results in showing the ABC column in the inventory

report as shown by clicking the **Inventory planning** tab (see figure below).

	Category	Category 2	Item code	Description	ABC analysis		On hand	Days of supply
					Revenue	Units		
1	Consumer goo...	Furniture	111565-02	Sofa Modern [seasonal m...	A 24%	B 1.74%	49	41
2	Fashion	Clothing Wint...	016542 Yellow	Winter Coat [excessive inv...	A 21.6%	A 11.5%	1690	253
3	Consumer goo...	Electronics	46689-PC	Computer [seasonal mod...	A 11.9%	C 1.29%	90	79
4	Consumer goo...	Furniture	1866-MB	Desk [stockout days]	A 6.63%	C 1.42%	30	32
5	Fashion	Clothing Wint...	016543 Purple	Winter Coat #2[new prod...	A 5.89%	B 3.11%	1183	275
6	Pharmacies	Pharmacies	VR2156 200	Vital Reds 200g Vitamins [...]	A 5.68%	A 12.3%	590	51
7	Consumer goo...	Electronics	89654-T	Toaster [constant level mo...	B 5.01%	C 0.894%	41	48
8	Food/Beverages	Water	056329 PU PW	Bottle water 500 ml [seaso...	B 4.76%	A 5.77%	106	22
9	Consumer goo...	Sporting goods	56645 Figure S...	White Women Figure Skat...	B 2.22%	C 1.16%	114	121
10	Pharmacies	Pharmacies	05-T48	Cold & Flu Tablets [seaso...	B 2.16%	A 14.8%	722	52

## Exporting Results

All the ABC analysis reports can be exported to Excel files. To export a report, click the **Export report** button on the toolbar of the corresponding tab (**Demand forecasting** or **Reports**).

## Disabling ABC Analysis

To hide the ABC analysis:

1. Go to the menu **File > Settings > ABC analysis** tab.
2. Set both criteria to **None**.
3. Click **OK**.

## Calculations Used in ABC Analysis

ABC analysis is calculated on a yearly basis. Thus, data of the last twelve months are used in calculations. The assignment of an item to a particular class (A, B, or C) is made based on the criterion value calculated for this item. Items having higher criterion values belong to class A, those which have a lower value are assigned to class B, and so on. There are five types of criteria:

- [unit-base criterion](#),
- [revenue-based criterion](#),
- [gross profit-based criterion](#),
- [COGS-based criterion](#), and
- [inventory value-based criterion](#).

In the next sections, we will concentrate on how these criteria are calculated depending on the available data.

## Unit-based

The unit-based criterion value is the annual volume of sales of an item.

## Revenue-based

Calculation of the revenue-based criterion differs depending on the provided data via the Streamline's data connection.

### Aggregated spreadsheet connection

The revenue-based criterion value is the sum of the revenue over the last twelve months if the revenue history is imported from an Excel file directly. If the history length is not sufficient, Streamline calculates the criteria based on the [averaged](#) monthly revenue.

The revenue-based criterion value is the product of the current selling price and the annual amount of sold units if the current **selling price** of an item is provided instead of the history of the revenue.

### Transactional spreadsheet connection, Database connection or 3-rd party systems

Depending on the data you provide, the criterion is calculated as:

$$Cr = \text{Sum}_{\text{year}}(\text{sales\_price/unit} * \text{qty\_sold}) \text{ or}$$

$$Cr = \text{Sum}_{\text{year}}(\text{sales\_price/order}).$$

Where:

- $\text{Sum}_{\text{year}}()$  is the sum of all the transactions over the last year;
- $\text{qty\_sold}$  is the amount of an item sold in a transaction.

## Gross Profit-based

Calculation of the gross profit-based criterion differs depending on the provided data via the Streamline's data connection.

### Aggregated spreadsheet connection

Streamline allows you to import the **inventory value/unit**, **inventory value**, or the **item purchase price**. Streamline's calculations use one of these. Let's denote the criterion Streamline uses of imported from this set as  $\text{item\_value}$ . Then the formula for the ABC analysis criterion is:

$$Cr = \text{Sum}_{12\text{months}}[(\text{avg\_sales\_price/unit}_i - \text{item\_value}) * \text{qty\_sold}_i],$$

where:



- $\text{Sum}_{12\text{months}} [ ]$  is the sum over the last twelve months;
- $\text{avg\_sales\_price/unit}_i$  is the selling price of one unit of an item averaged over the  $i$ -th month; and
- $\text{qty\_sold}_i$  is the amount of an item sold in the  $i$ -th month.

When the **inventory value** is used,  $\text{item\_value}$  is calculated as:

$$\text{item\_value} = \text{inventory\_value/on\_hand}.$$

The  $\text{on\_hand}$  value is the item quantity currently on hand.

### Transactional spreadsheet connection, Database connection or 3-rd party systems

Depending on the data you provide, the criterion is calculated as:

$$\text{Cr} = \text{Sum}_{\text{year}}[(\text{sales\_price/unit} - \text{item\_value}) * \text{qty\_sold}] \text{ or}$$

$$\text{Cr} = \text{Sum}_{\text{year}}(\text{sales\_price/order} - \text{item\_value} * \text{qty\_sold}).$$

Where:

- $\text{Sum}_{\text{year}} ( )$  is the sum across all transactions during the last year;
- $\text{qty\_sold}$  is the amount of an item sold in a particular transaction;
- $\text{sales\_price/unit}$  is the selling price of one unit of an item in a transaction;
- $\text{sales\_price/order}$  is the sales transaction price of an item; and
- $\text{item\_value}$  can be either the **inventory value/unit** or the **item purchase price**, depending on what you provide.

### COGS-based

Calculation of the COGS-based criterion differs depending on the provided data via the Streamline's data connection.

#### Aggregated spreadsheet connection

Streamline allows you to import the **inventory value/unit**, **inventory value**, or the **item purchase price**. Streamline's calculations use one of these. Let's denote the criterion Streamline uses from this set as  $\text{item\_value}$ . Then the formula for the ABC analysis criterion is:

$$\text{Cr} = \text{Sum}_{12\text{months}}(\text{item\_value} * \text{qty\_sold}_i).$$

Where:

- $\text{Sum}_{12\text{months}}()$  is the sum over the last 12 months; and
- $\text{qty\_sold}_i$  is the amount of an item sold in the  $i$ -th month.

When the **inventory value** is used,  $\text{item\_value} = \text{inventory\_value}/\text{on\_hand}$ . The  $\text{on\_hand}$  value is the item quantity currently on hand.

### Transactional spreadsheet connection, Database connection or 3-rd party systems

The criterion value is the product of the **inventory\_value/unit** and item amount sold for the last year.

### Inventory value-based

The criterion value is either:

- the **inventory value** or
- the  $\text{inventory\_value}/\text{unit} * \text{on\_hand}$ , or
- the  $\text{item\_purchase\_price} * \text{on\_hand}$ ,

depending on the type of data you provide.

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