



# User Guide

## Market Barometer

For supporting Market Development

[ExportPlanning.com](http://ExportPlanning.com)

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# Table of Contents

<b>Presentation</b>	<b>3</b>
<b>Features</b>	<b>4</b>
Dashboard . . . . .	4
Content area . . . . .	5
Market trends' indicators . . . . .	6
Navigation Features . . . . .	6
Select the Declarant . . . . .	6
Change Measure . . . . .	7
Select the observation period . . . . .	7
Select Competitors . . . . .	7
Focus on Competitor . . . . .	8
Compare Competitor Performances . . . . .	8
User Data Upload . . . . .	8
Export results . . . . .	9
PDF Report . . . . .	9
Download CSV . . . . .	9
<b>Main Data Mining Techniques</b>	<b>10</b>
Data Mining . . . . .	10
Management of Missing Statements . . . . .	10
Management of Missing Measures . . . . .	10
Management of Outliers . . . . .	10
Nowcasting . . . . .	11
Seasonal Adjustment Procedure . . . . .	11
Data Sources . . . . .	12
Eurostat - db Comext . . . . .	12
United Nations - db Monthly Com- trade . . . . .	12
US Census Bureau - db UsaTrade . . . . .	12

# Presentation

For Small and Medium Enterprises (SME), experience of sales in local, domestic markets are in most cases strongly consolidated. Overseas markets, on the contrary, tend to be little known and often associated with high variability.

**Market Barometer**<sup>1</sup> is a tool designed to support businesses that are already operating in foreign markets and provide them with benchmarks<sup>2</sup> with which to evaluate their results. The tool provides the possibility of uploading and displaying users own data to compare with that of competing reference countries in the market.

In particular, **Market Barometer** provides quarterly updates of the economic dynamics for imports of various relevant international markets categorised by industry / sector / product, and measured both in terms of *Total Imports* and of *Imports from major competitor countries*. By leveraging this information, an SME will gain a preliminary evaluation of its results obtained in the target markets and be able to examine the factors that underlie any deviation from its expectations.

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<sup>1</sup>The use of the term *barometer* is designed to indicate a tool useful for measuring the performance (*improvement / worsening / stability*) of a particular foreign market.

<sup>2</sup>A technique to compare the company's results with a *reference benchmark* (the most appropriate available to represent "external effects") is an established and particularly effective technique. In particular, for little known, highly variable environments, like that of SME foreign markets, objectives should not be formulated in terms of turnover, but in terms of an X % more than the overall market growth or, more than groups of competitors.

# Features

The figure below shows the home-page of the MarketBarometer tool.

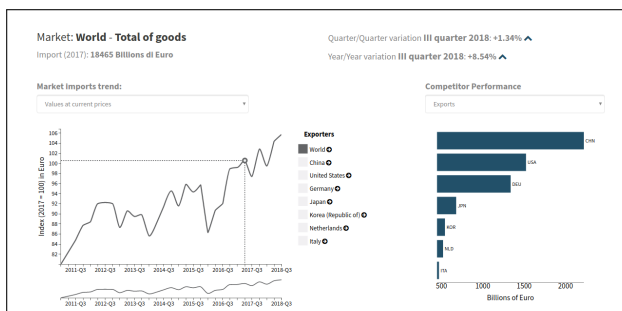


Chart 1: Market Barometer Homepage

## Dashboard

The horizontal bar of the tool presents some navigation buttons:

**Change Product** : consists of a menu with the following selection tools:

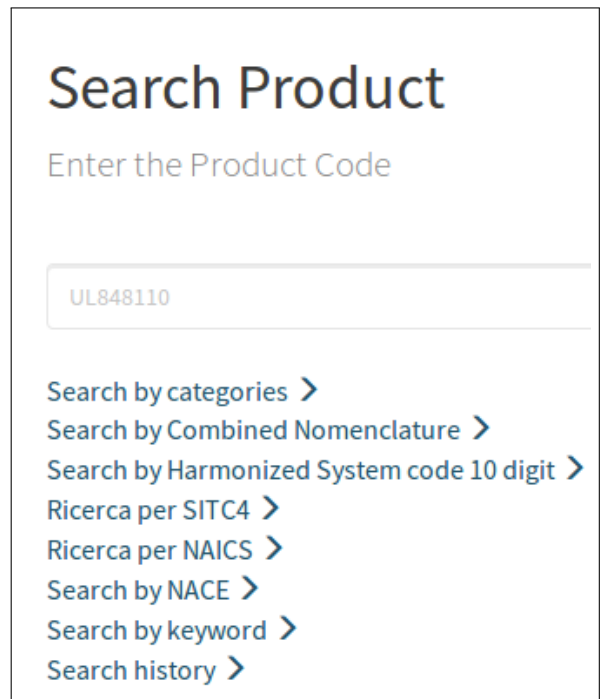


Chart 2: Change Product

**Search by Category** : a guided tour through the various levels of the ExportPlanning Products Classification<sup>3</sup>;

**Search by Combined Nomenclature** : provides a view of the selected product by using an 8-digit Combined Nomenclature code<sup>4</sup>;

**Search by HS10digit code** : select a product by inserting a custom code accor-

<sup>3</sup>The ExportPlanning Products Classification is structured according to the following levels:

**Industry** (UL20 level of classification, consisting of 22 items): different industries are characterised by macro phases of the transformation process (differentiating industries related to raw materials from those of intermediate and finished goods), and destination (differentiating between macro areas of consumption and investment decisions)

**Sector** (UL200 classification level, consisting of more than 200 items): within each industry, the various sectors have been grouped by the type of input used and processing stage

**Business Unit** (UL3000 classification, consisting of over 3000 items): For a description of the ExportPlanning Products Classification, please see the document at [http://www.exportplanning.com/media/filecaricati/pdf\\_analytics\\_en/ClassUlisse2008.pdf](http://www.exportplanning.com/media/filecaricati/pdf_analytics_en/ClassUlisse2008.pdf);

**Product** (HS classification , consisting of over 5000 items).

<sup>4</sup>Please refer to the CN8 classification at <http://www.exportplanning.com/pages/classification/>.

<sup>5</sup>Please refer to the HS10 classification at [http://www.exportplanning.com/media/filecaricati/csv\\_analytics/ClassHSUSA.csv](http://www.exportplanning.com/media/filecaricati/csv_analytics/ClassHSUSA.csv). Please note that any HS 10-digit code is preceded by a suffix ("M" or "X") that qualifies whether the code is for an US Import declaration ("M") or an US Export declaration ("X").

ding to Harmonized System classification at 10digits, valid for US operators<sup>5</sup>;

**Search by SITC4 code** : select a product by inserting a code according to the Standard International Trade Classification (rev. 4) by UN<sup>6</sup>;

**Search by NAICS code** : select a product by inserting an economic activity code according to North American Industry Classification System<sup>7</sup>;

**Search by NACE code** : provides a view of the selected product by using a 4-digit NACE code;

**Search by Keyword** : provides a view of the selected product by a keyword;

**Change Country** : refers to a list of *relevant* countries for the selected product

**Euro | Dollars** : permits currency selection (euro or dollar) for market information analysis. This permits an evaluation of market trends of the competitive benchmark, taking into consideration currency aspects

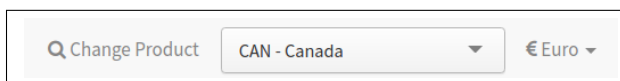


Chart 3: Navigation Dashboard

## Content area

The following content is provided for the selected market:

<sup>6</sup>Please refer to the SITC4 classification at [http://www.exportplanning.com/media/filecaricati/csv\\_analytics/DASITC4\\_AHS17.csv](http://www.exportplanning.com/media/filecaricati/csv_analytics/DASITC4_AHS17.csv).

<sup>7</sup>Please refer to the NAICS classification at [http://www.exportplanning.com/media/filecaricati/csv\\_analytics/DANAICS\\_AHSUSA.csv](http://www.exportplanning.com/media/filecaricati/csv_analytics/DANAICS_AHSUSA.csv).

<sup>8</sup>Move the mouse to select and display the specific information associated with a given observation, as shown for example, in Chart 5

<sup>9</sup>Please see User Profile ([exportplanning.com/profilo/change/](http://www.exportplanning.com/profilo/change/)) the selected **Reference country**.

**Market Overview** : indicated the Product and Country analysed (in the example below: *Canada-Dishwashers*), reporting trends over the last quarter (in the example below this is Q3-2018), in terms of variations (compared to the same quarter of the previous year) and short-term figures (compared to the previous quarter).

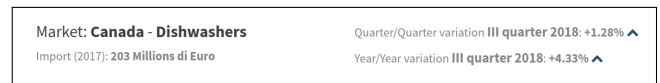


Chart 4: Market Overview

**Market Trends** : the trend of market imports for specific competitive Benchmarks are shown in an interactive graph<sup>8</sup>; in particular:

- from **World**;
- from the **Reference country** set by the user<sup>9</sup>;
- from one or more of the other **relevant competitor countries** for the analysed market.

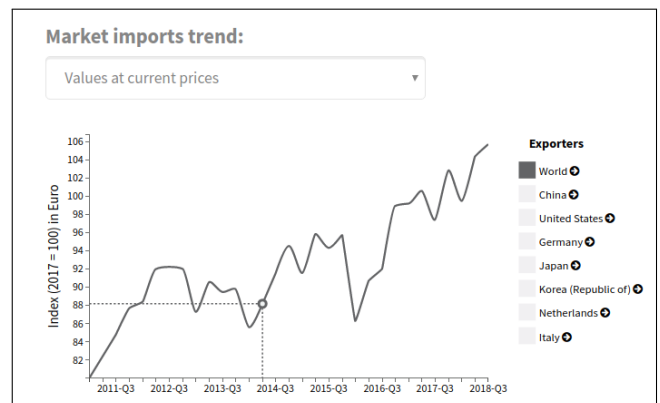


Chart 5: Market Trends



Chart 6: Example of Tooltip

**Competitor Performance** : provides information on the performance of the main competitor country markets

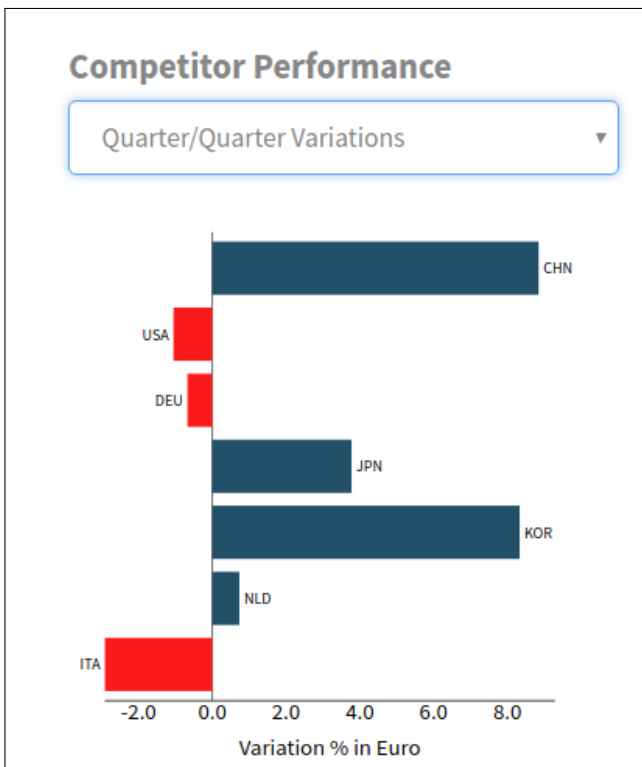


Chart 7: Competitor Performance

## Market trends' indicators

The indicators used for the measurement of cyclical trends in a given market are as follows:

**Value index** : provides an intuitive measurement of economic trends

**Growth Rate: Quarter-over-Quarter** : change measured over the previous period; this is a particularly useful indicator with low seasonality of product foreign trade

**Growth Rate: Year-over-Year** : change measured since the same period last year; this is a particularly useful indicator of high seasonality of product foreign trade

**Cumulative Growth Rate** : cumulative yearly change compared to the cumulative change of the previous year; specifically used for supporting control of results in terms of annual budget

**Moving Average Growth Rate** : change of the moving average over the last four quarters compared to the moving average of the previous year; specifically used to remove any elements of a seasonal nature and to see trend.

## Navigation Features

### Select the Declarant

As is probably well known, foreign trade flows involve double reporting:

- the declaration of the exporting country;
- the declaration of the importing country;

It is important to be aware of this aspect, because these are two declarations that are disjointed and can be (even significantly) different.



Fig. 8: Select the Declarant

In order to allow the user to consider the type of observation that he considers more reliable or even just to compare different types of observations, the Market Barometer module presents the possibility to choose which statements to consider among the following:

**Average Declarations** : this is the option presented as *default* by the system; it is calculated as the average between the declarations (those of the importing country and those of the exporting countries);

**Importer's Declarations** : consists of the declarations of the importing country;

**Exporters' Declarations** : consists of the declarations of the exporting countries.

### Change Measure

With the trend graph, the user can select a certain *measure*, from the following:

**Values at current prices** : monetary values in current terms

**Values at constant prices** : deflated<sup>10</sup> monetary values

Seasonally adjusted values <sup>11</sup>.



Chart 9: Change Measure

### Select the observation period

At the bottom of the interactive trend graph, a thumbnail allows the user to select a specific time frame, allowing more precise understanding of the dynamics of short, medium or long periods.

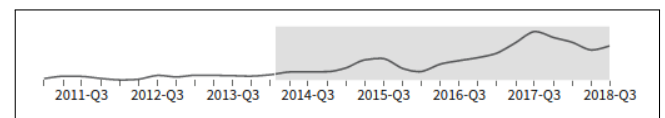


Chart 10: Select the observation period

### Select Competitors

With the interactive legend it is possible to select (adding and / or eliminating) competitive benchmarks to view in the graph.




<sup>10</sup>In economic statistics *deflation* this assumes great importance in allowing inter-temporal comparisons in order to analyse changes in *economic quantities*.

<sup>11</sup>Please see the related methodology on page 10 of the document.

Chart 11: Interactive Legend

### Focus on Competitor

Clicking the  button, deepens the trends of a particular competitor country; a Competitor-specific tab is composed of:

**Graph** : presents the evolution of various market performance indicators for the Competitor, in graphic form

**Table** : presents the evolution of market trends for the Competitor, in a tabular form.

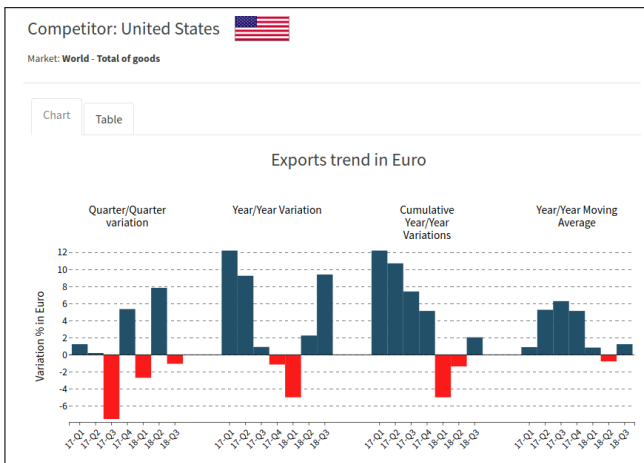


Chart 12a: Focus on Competitor-Graph

		Quarter			
		I	II	III	IV
2017	Levels				
	Value	102	103	95	100
	Change rate				
	Quarter/Quarter	+1.2	+0.2	-7.5	+5.4
	Year/Year	+12.2	+9.3	+0.9	-1.1
2018	Levels				
	Value	97	105	104	.
	Change rate				
	Quarter/Quarter	-2.7	+7.8	-1.1	.
	Year/Year	-5.0	+2.3	+9.4	.

Chart 12b: Focus on Competitor-Table

## Compare Competitor Performances

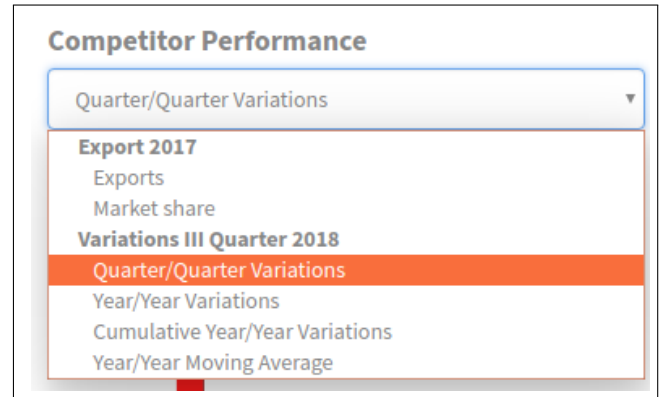


Chart 13: Indicators of Competitor Performance

With the menu shown in Chart 13, it is possible to select a specific performance indicator from the following:

**Export 2017** :

**Export** in market values;

**Market shares** as a % of total exports to the market

**Variations** over the last quarter:


**Quarter/Quarter** ;

**Year/Year** ;

**Cumulative Year** ;

**12-Month Moving Average** .

## User Data Upload

The user can upload data in CSV format with the  button in the horizontal navigation bar. The CSV file (Comma-Separated-Values) must contain a column with **DATE** header and **YYYY-QQ** format, in addition to the quarterly data that the user wants to compare. For correct functioning it is necessary that at least one observation in 2017 is present.



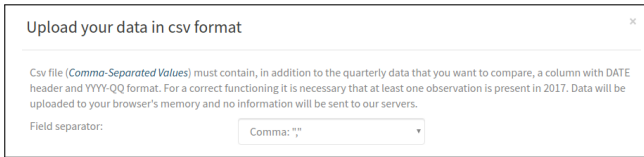


Chart 14: Data Loading Menu

Once the file has been uploaded and the columns of interest are selected, the user data (in the example shown in Chart 15 indicated as "Rossi Spa") will be compared to those of the selected competitors.

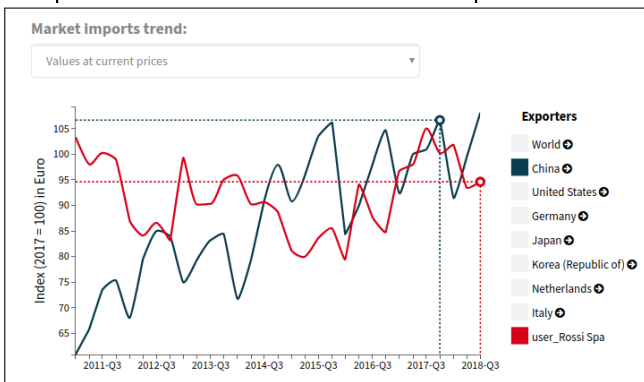
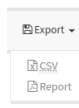


Chart 15: Example of displayed User data

NB: Data will only be uploaded to the user browser memory and no information will be sent to ExportPlanning servers.

## Export results

### PDF Report



The navigation bar **Report** button allows the user to receive an organised collection of market information in the form of a pdf report, via email.

### Download CSV



The navigation bar **CSV** button feature allows the user to download an organised collection of market information in the form of a CSV file.

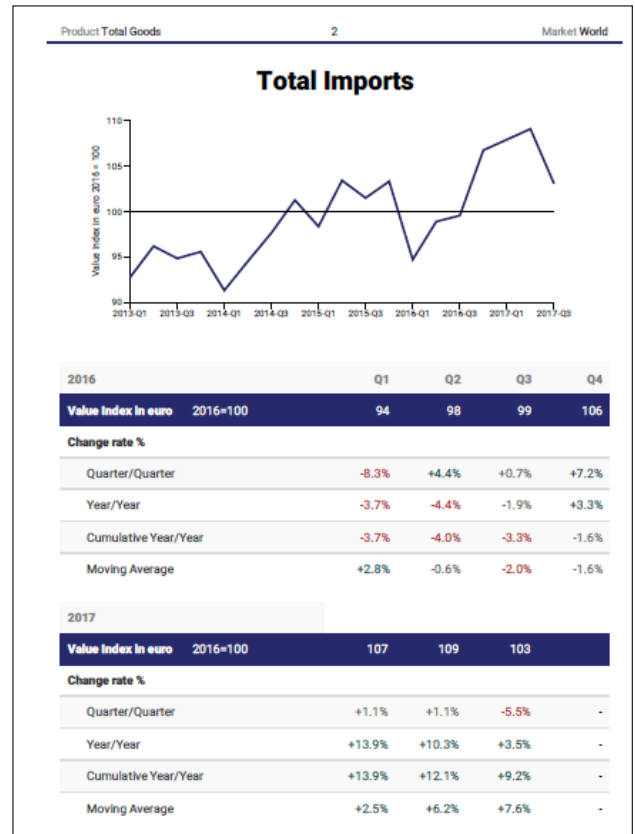


Chart 16: Example of PDF Report

	A	B	C	D
1	Market:	World		
2	Product:	Total Goods		
3	Currency:	Euro		
4	INDEX Base:	2016=100		
5				
6	Version:	30/10/2017		
7	Source:	Sistema Informativo Ulisse		
8				
9				
10	Variable Legend:			
11	PERIOD:	Period of the flow		
12	COMP:	Exporterper country ISO3 code		
13	DESCR_COMP:	Exporter country ISO3 code description		
14	INDEX:	Import Flow Index		
15				
16	PERIOD	COMP	DESCR_COMP	INDEX
17	2012Q4	WLD	World	97
18	2013Q1	WLD	World	92
19	2013Q2	WLD	World	96
20	2013Q3	WLD	World	94
21	2013Q4	WLD	World	95
22	2014Q1	WLD	World	91
23	2014Q2	WLD	World	94
24	2014Q3	WLD	World	97
25	2014Q4	WLD	World	101
26	2015Q1	WLD	World	98
27	2015Q2	WLD	World	103
28	2015Q3	WLD	World	101
29	2015Q4	WLD	World	103
30	2016Q1	WLD	World	94
31	2016Q2	WLD	World	98
32	2016Q3	WLD	World	99
33	2016Q4	WLD	World	106
34	2017Q1	WLD	World	107
35	2017Q2	WLD	World	109
36	2017Q3	WLD	World	103
37	2012Q4	CHN	China	87
38	2013Q1	CHN	China	78
39	2013Q2	CHN	China	83
40	2013Q3	CHN	China	87
41	2013Q4	CHN	China	88
42	2014Q1	CHN	China	88

Chart 17: Example of CSV File

# Main Data Mining Techniques

## Data Mining

### Management of Missing Statements

On occasions foreign trade data might suffer from *missing statements*, in particular with regards to developing countries.

In order to manage this issue, StudiaBo used a technique of *filling missing data*, as part of its Data Warehouse design. The technique is based on the interpolation of time series for each missing country data, following identification of its most frequent partner countries.

### Management of Missing Measures

Similarly, on occasions foreign trade data might suffer from *missing measures* (i.e.: "not available"), especially with regard to quantities.

In order to handle this type of issue, StudiaBo has developed the following technique, which aims to estimate the "not available" quantities (whether expressed in kilograms or in supplementary unit measures):

- For every foreign trade flow<sup>12</sup>, construction of a characteristic ratio, called Average Unit Value, expressed as the ratio of monetary value and quantity in kilograms;
- Construction of a *benchmark* for the characteristic ratio of the flow, given by the geometric mean of two marginal distributions related to the size of the reporting country (Average

Unit Value expressed by the reporting country) and partner country (Average Unit Value inherent in the statements reported towards a given partner country);

- Calculation of the time series of the Average Unit Value for a single customs code;
- In cases where the characteristic ratio of the flow is not determined, this is reconstructed by taking into account the three components mentioned above (namely: temporal dynamics, average unit value expressed by the reporter, average unit value which is characteristic of the partner).

Note that this method also applies to a second characteristic ratio of the flow, which is given by the ratio of the measures of quantity in kilograms and in a supplementary unit measure. It seems appropriate to emphasise that in this second case, the distributions at the margin are characterised by greater stability at the level of a single fact [export / import by a reporting country to a partner country in a given unit of time], just by virtue of the fact that it represents average values calculated on a greater number of observations.

The stability of the information at the margin is also guaranteed by StudiaBo through specific techniques for the detection and management of *outliers*.

### Management of Outliers

Outliers are measurement errors which, if not treated, affect understanding of the economic phenomenon. In literature on foreign trade flows, such errors are particularly frequent in quantity measures. For this reason StudiaBo, after construction of the characteristic ratios of each flow, subjects the obtained time series to specific control filters. Specifically,

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<sup>12</sup>A flow (or fact) is defined as the combination of the export / import dimension of a reporting country towards a partner country for a given customs code, in a given unit of time.

through orderly distribution of these characteristic ratios, StudiaBo sets ranges (based on the first and ninth deciles of the distribution) within which observations are considered *reliable*. The observations excluded from such ranges are thus recalculated to be within the validity range, resulting in a *smoothing* distribution of observations.

### Nowcasting

In order to allow to monitor even the most recent facts and exploit all the available information, specific econometric models have been developed, such as **ARIMA** (Auto Regressive Integrated Moving Average), to make some **pre-estimates** at the end of the current quarter. The development of these pre-estimates can allow to offer to a user particularly updated information for a real time control of their results on foreign markets.

Another methodological element that should be considered concerns the **Double Declaration**. Each foreign trade flow is, in fact, declared twice: by the exporting country and the importing country. The Double Declaration, if properly used<sup>13</sup>, allows to:

- make the most of the available statements<sup>14</sup>;
- significantly increase the reliability of the measures relating to the various phenomena.

### Seasonal Adjustment Procedure

The classic analysis of time series, based on empirical processes, aims to break down a time series into its components. The main models proposed in economics literature are the additive model, the multiplicative model and the mixed model:

- Additive:

$$D_i = T_i + C_i + A_i + S_i$$

- Multiplicative:

$$D_i = T_i \cdot C_i \cdot S_i \cdot A_i$$

- Mixed:

$$D_i = (T_i \cdot C_i) + S_i + A_i$$

, or

$$D_i = (T_i \cdot C_i \cdot S_i) + A_i$$

Models depend on whether the seasonal effect is thought to be additive or multiplicative;

Where  $D_i$  indicates the  $i$ -th observed data,  $T_i$  is the long-term trend,  $C_i$  is the period of the economic cycle,  $S_i$  is the seasonal (regular movements due to socio-economic factors) and  $A_i$  is the random component.

These models are offered mainly due to their simplicity, but there are no rules or special reasons to prefer one method over the others.

In our case, it was decided to use the X13-Arima procedure developed by the Census Bureau of the United States. The starting point is the decomposition of the time series into its components ( $T_i, C_i, S_i$  and  $A_i$ ), which is done by use of moving averages (averages subsequent terms of a time series). A moving average has a smoothing effect, because it tends to reduce random irregularities present in a time series (reducing variability). In this sense it reconstructs the underlying trend.

<sup>13</sup>A methodological technique widely used in economic literature to manage the Double Declaration of Foreign Trade Flows is called *Mirror Flows*.

<sup>14</sup>The sample of reporting countries considered in the construction of the Market Barometer currently consists of about 70 countries. For these reporting countries all competing countries in the market are covered. For the other countries, however, information is only available for 70 competing countries. Moreover, the sample examined can be considered highly representative of the total international trade: the total number of declarations of the countries included in the sample examined exceeds, in fact, 80% of the total flows at world level.

The seasonal adjustment procedure is made up of the following steps:

- Trend reconstruction through the moving average: difference between the observed series and the moving average for the additive model. While for the multiplicative model the ratio of the two elements provides us the seasonal ( $S_i$ ) and accidental ( $A_i$ ) components
- Preliminary isolation of the seasonal component ( $S_i$ ): an estimate for each sub-period is made using a moving average (remembering that  $A_i$  has zero mean)
- Identification of outliers: made with a weighting of their medium
- Re-estimation of gross seasonal component ( $S_i$ ): by applying a rolling average over the sub-periods - focuses this component so that it totals to zero for the total of periods in the year
- Proceed with the final estimate for the seasonally adjusted series.

## Data Sources

### Eurostat - db Comext

Eurostat Comext (<http://ec.europa.eu/eurostat/estat-navtree-portlet-prod/BulkDownloadListing?sort=1&dir=comext>) is the database of monthly statements of foreign trade reported by EU and EFTA countries.

For each monthly flow of foreign trade, db Comext reports the measures in both monetary values and in volumes (kilograms and / or other supplementary unit measure). Data are updated monthly at fixed intervals, with a delay of about six weeks for flows

reported to partner countries outside Europe, and of about 10 weeks for flows reported to European countries.

EU member states use a very detailed level of customs classification, called the Combined Nomenclature, at 8-digit level (CN8). CN8 consists of a further specification with respect to the 6-digit Harmonized System (HS6) customs classification. Each HS6 chapter is the sum of one or more sub-NC8s.

### United Nations - db Monthly Comtrade

Since 2010, the United Nations Statistics Division has been carrying out an experimental project called Monthly Comtrade, aimed at the construction of an online database, accessible at <http://comtrade.un.org/monthly/>, for monthly foreign trade flows reported by UN countries.

Data is available in dollars and kilograms, for each product of the Harmonized System customs classification at 6-digit level (HS6).

### US Census Bureau - db UsaTrade

The US Census Bureau disseminates monthly foreign trade data reported by the United States of America through the portal, UsaTrade Online (<https://usatrade.census.gov/>), according to the Harmonized System customs classification at 10-digit level (HS10). HS10 consists of a further specification with respect to the 6-digit Harmonized System (HS6) customs classification. Each HS6 chapter is the sum of one or more sub-HS10s.