



# Database Automotive: Methodological note

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## Methodological note database Automotive

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# Presentation

This document describes the methodological choices made to build the Automotive database, which collects data on the sector for more than 150 countries. It includes information about international trade, production, sales, demand and vehicles in use.

The choice to examine this industry in depth by building a specific database stems from the acknowledgement of the key role of automotive industry in the industrial production of many countries. The development of this sector on a national basis can be read as an indirect measure of industrialization.

In the last 20 years, this industry has led, together with electronics, the growth of world trade in the manufacturing sector. It has also experienced deep changes that entailed repercussions on the whole supply chain. The latest innovations that will radically transform the present structure of the supply chain focus on three main themes: the use of electricity to power motor vehicles, through batteries or hydrogen cells, digitalization and connected cars and, last but not least, autonomous vehicles.

A broad source of information such as the Automotive database, which draws different sources together and makes them comparable, allows to widen and enhance the analysis of international trade, one of the key areas of expertise in StudiaBo. The integration of international trade data and country-specific information such as production, sales and motorization allows to take into account phenomena and changes that happen within a country's borders, and therefore are not registered by going through customs.

## Sources

**OICA.** One of the main sources of the Automotive database is OICA website (International Organization of Motor Vehicle Manufacturers, [www.oica.net/](http://www.oica.net/)).

OICA provides data about production and sales of motor vehicles, and vehicles in use worldwide, free of charge. These figures can be estimated by OICA or directly declared by national trade unions belonging to OICA.

**Ulisse database.** Another relevant source is Ulisse database, which provides data about yearly international trade; only data about trade in the automotive sector have been included in the Automotive database. You can access Ulisse through the Analytics section of Export-Planning ([www.exportplanning.com/pages/market\\_research/](http://www.exportplanning.com/pages/market_research/)). Data from Ulisse have also been used to estimate missing data about production and sales of motor vehicles, downloaded from [www.oica.net/](http://www.oica.net/).

# Database structure

The Automotive database allows to analyze the following economic variables, for 152 countries belonging to Ulisse classification ([www.exportplanning.com/pages/analytics-documenti/](http://www.exportplanning.com/pages/analytics-documenti/)):

- **Imports of motor vehicles;**
- **Exports of motor vehicles;**
- **Production of motor vehicles;**
- **Sales of motor vehicles**, measured as registrations of new motor vehicles;
- **Apparent demand of motor vehicles**, estimated as the sum of national production and net imports: it is the hypothetical demand that would be expressed by consumers, assuming that there are no stocks;
- **Vehicles in use.**

The product classification used in this database distinguishes Passenger Cars and Commercial Vehicles, reflecting the classification used by OICA. On the contrary the other source, Ulisse database, provides detailed data on a customs code level: so, to make the two sources comparable, data from Ulisse have been aggregated to create the binary distinction between Passenger Cars and Commercial Vehicles also in the Imports and Exports section of the Automotive database. This aggregation allows the user to compare all the variable in the database.

# Missing data: methods of estimation

Some of the time series downloaded from OICA presented the problem of missing data. This has been handled through various methods of estimation, as explained below.

## Production and apparent demand

OICA data about motor vehicles production cover about one third of Ulisse countries. Missing data have been estimated using international trade data (downloaded from Ulisse database) and sales data (downloaded from OICA website).

Assuming that stocks equal zero, apparent demand of motor vehicles equals sales.

(1) Apparent demand = Production + imports – exports

(2) Sales = Production + imports – exports

Production (for a given country in a given year) can be therefore estimated as:

(3) Estimated production = Sales – imports + exports

## Validation and control

Results of the estimates have replaced missing data in time series if estimated production exceeded 10.000 units (a production plant is economically sustainable if it produces at least 10.000 motor vehicles per year) for at least 3 consecutive years (lack of continuity could indicate the presence of *outliers*).

In case of few missing data in a time series, the method of interpolation has been preferred: in this way, the estimated figure was closer to contiguous observations.

For every country, estimations have been checked. Firstly, the reliability of the method of estimation has been checked by comparing the actual number of vehicles produced with the estimated number, for those countries for which OICA data about production are available. The comparison has shown a good conformity.

Secondly, qualitative research has been conducted, in order to evaluate the reliability of motor vehicles production estimates. For Finland and Colombia, the following sources have been consulted: Autoalan Tiedotuskeskus, The Finnish Information Centre of Automobile Sector ([www.aut.fi/en/statistics](http://www.aut.fi/en/statistics)) and ACOLFA, Asociación Colombiana de Fabricantes de Autopartes ([www.acolfa.org.co/](http://www.acolfa.org.co/)).

## Sales

OICA data about motor vehicles sales cover almost every Ulisse country. Data are missing just for 21 developing countries (that we name "missing group"), that do not produce motor vehicles.

Assuming that, in countries that do not produce motor vehicles, sales of new vehicles are a share of imports, sales in the "missing group" have been calculated as follows:

- Identification of countries that do not produce motor vehicles, but for which sales data are available (we name this group "benchmark");
- Calculation of the sales of new vehicles as a share of total imported units for "benchmark group";

- Use of the share just calculated to obtain an estimate of sales of motor vehicles on a national level, for countries belonging to the "missing group".