

## Warehouse Data NL/BE 2017

### Origin of Dataset

This dataset was compiled in 2017 by Christian Kaps with the support of René de Koster from Erasmus University Rotterdam as well as the warehouse associations evofendex and TLN in an effort to gather real-life data for a research project on automation's effect on warehouse efficiency.

The core variables per warehouse are 4 input measures (Floor space, SKUs, FTEs and Automation Level) and 4 output measures (Order Lines, Error Free %, Special Services and Flexibility). Each respondent was asked to provide data for the current operations (2017) and, based on records or recollection, data for 2012. In addition to these data, a few variables on value-chain position, ownership structure and industry were also collected per warehouse.

Through asking 1,827 warehouses managers in the Netherlands and Belgium to fill out an online survey (Warehouse\_Data\_NL\_BE\_2017\_Questionnaire.pdf contains the printed version of the survey), 214 submissions were obtained of which 131 were complete and use-able (7.2%). These 131 respondents constitute this dataset.

### Explanation of the Data

The raw data (Warehouse\_Data\_NL\_BE\_2017\_Raw.csv) contains the following columns, loosely following the survey structure, while identifiable information was omitted. The first columns are categorizations of the warehouse, followed by the aggregated response data:

- **DMU**
  - Unique, randomized identifier of the respondent from 1 to 131
- **Industry**
  - The product category/industry that best describes the warehouse. Multiple answers possible. Corresponds to Q2.4 of the survey.
- **Value Chain**
  - The value chain position that best describes the warehouse. Corresponds to Q2.5 of the survey.
- **Logistics Service Provider**
  - The ownership structure of the warehouse. Corresponds to Q2.6 of the survey.
- **Final 102 DMUs**
  - 1 if the warehouse was used in the data for the research project and the paper by [Balk et al. \(2017\)](#), 0 otherwise. Warehouses below 5 FTEs and warehouses that had not existed for at least 5 years were excluded, reducing the 131 warehouses to 102.
- **FTEs 17/12**
  - Sum of Direct and Indirect FTEs for 2017 and 2012 respectively. Corresponds to Q3.1 of the survey.
- **Floor Space 17/12**
  - The total floor space of the warehouse in square meters for 2017 and 2012 respectively. Corresponds to Q3.2 of the survey.
- **Cold Storage % 17/12**

- The percentage of floor space that was cold storage in 2017 and 2012 respectively. Corresponds to Q3.3 of the survey.
- **SKUs 17/12**
  - The average number of unique stock-keeping-units (SKUs) that the warehouse stored at any time during 2017 and 2012 respectively. Corresponds to Q4.1 of the survey.
- **Automation Score 17/12**
  - The sum of hardware and software automation scores for 2017 and 2012 respectively. Hardware automation score was calculated on the sum of different automation technologies employed by the warehouse. Software automation was scored 1-6 depending on the level of sophistication of the warehouse's ERP system and its integration. Corresponds to Q5.2-5.4 of the survey.
- **Order Lines 17/12**
  - The average number of daily order lines that are outgoing throughout 2017 and 2012 respectively. Corresponds to Q4.2 of the survey.
- **Error Free % 17/12**
  - A 9-point likert scale score that classifies the percentage of order lines shipped that were error free during 2017 and 2012, where higher scores represent higher percentages of error-free shipping. Corresponds to Q4.3 of the survey.
- **Special Services 17/12**
  - A sum of all the different value adding services the warehouse was performing in 2017 and 2012 respectively. Corresponds to Q5.1 of the survey.
- **Flexibility 17/12**
  - A sum of 6 likert-scale questions about the flexibility of the warehouse in dealing with changes in the operational environment. Each of the 6 questions were scored from 1 to 5, with 5 indicating higher degrees of flexibility. Corresponds to Q5.5-Q5.6 of the survey.

## Descriptives

A brief summary of the main descriptive statistics for the input, output and categorization variables for 2017 and 2012 can be found in the file (Warehouse\_Data\_NL\_BE\_2017\_Descriptive\_Statistics.xlsx)

## Contact

If you have any questions about the dataset, please contact Christian Kaps under [ckaps@wharton.upenn.edu](mailto:ckaps@wharton.upenn.edu).