



Example of statistical Benchmark

Printing industry

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EXAMPLE

Executive Summary

This report presents the results of a statistical benchmarking study for printing activities in France.

This study was performed by TP qube in May 2019 using data from the Bureau van Dijk Orbis database. TP qube used a proprietary statistical model, trained on more than 13 000 independent companies located in Europe. Based on statistical learning techniques, this model estimates the interquartile range of the normative profitability of the tested party, i.e. the profitability it would earn if it were independent.

The Profit Level Indicator (PLI) retained by TP qube for this search is the Return on Total Costs (“RoTC”), defined as follows:

$$\text{RoTC (Return on Total Costs)} = \frac{\text{Operating Profit (EBIT)}}{\text{Sales} - \text{Operating Profit (EBIT)}}$$

This search produced the following range for the normative profitability of the tested party:

Table 1 – Predicted interquartile range for the return on total costs

RoTC Weighted average 2014-2016	
1st quartile	0.3%
Median	4.4%
3rd quartile	6.5%

1. Main database used

This study relies primarily on data provided by an external database of company financial data, Orbis, which is published by Bureau van Dijk (BvD) and provides financial and market data on over 165 million companies.

It is the most comprehensive database available for company information, worldwide and the reference database for transfer pricing purposes. The information contained in the Orbis database is sourced from more than 40 different information providers. For each company, Orbis provides financial information (profit and loss account, balance sheet, etc.) and other descriptive information (activity codes, directors, ownership and subsidiaries, etc.). It is to be noted that company specific information available in the database is dependent on filing requirements in the different countries.

2. Dataset description

TP qube's statistical model is trained on all companies fulfilling the following criteria:



In total, the model was trained on 13 628 observations.

3. Overview of the statistical model

The goal of this analysis is to provide an estimation of the level of profitability that would have been achieved by the tested party if it were independent. This normative profitability is determined using a large dataset of independent comparable companies. Using statistical learning techniques, TP qube's statistical models provide an estimation of the interquartile range of the normative profitability (namely the 25th, 50th and 75th percentile of the profitability distribution). This estimation takes into account characteristics of the tested party, that are provided in section 4, such as the industry, country, maturity, size, working capital and other financial ratios.

In mathematical terms, we aim at estimating :

$$q_{\tau}(Y|X_1, X_2, X_3, \dots) = f_{\tau}(X_1, X_2, X_3, \dots)$$

With :

q_{τ} the quantile at the order τ ,

Y the profitability,

X_1, X_2, X_3, \dots the parameters which affect the profitability of the company such as its size, industry, maturity, geography, etc.

f_{τ} a mathematical function to be defined.

The model is trained on a large set of independent companies, ensuring the robustness of parameter estimation. Once the model is trained, the estimate for the profitability quantile is determined by:

$$\tilde{q}_{\tau}(Y|X_1^*, X_2^*, X_3^*, \dots)Y^* = \tilde{f}_{\tau}(X_1^*, X_2^*, X_3^*, \dots)$$

With : Y the profitability,

X_1^*, X_2^*, X_3^* the parameters of the tested party,

\tilde{f}_{τ} , the estimated functional form and \tilde{q}_{τ} the resulting estimation of the conditional quantile of Y at the order τ .

4. Tested party characteristics

The tested party has characteristics presented in the table below, as provided by our client. TP qube has not independently reviewed this information.

Table 2 – Tested party characteristics

Item	Tested party characteristics
<i>Sanitized</i>	

These characteristics were fed into our model to estimate the counterfactual profitability for this tested party.

5. Choice of profit level indicators

The financial performance of the comparable companies can be measured by various ratios. The appropriateness of a profit level indicator in a given situation depends on a number of factors including:

- The nature of the activities of the tested party,
- The reliability of the available data with respect to uncontrolled comparable companies, and
- The extent to which the profit level indicator is likely to produce a reliable measure of the income that the tested party would have earned had it dealt with controlled taxpayers at arm's length, taking into account all of the facts and circumstances.

In the context of this study, given the functional profile of the tested party TP qube selected the RoTC as the appropriate profit level indicator (PLI). The RoTC is defined as follows:

$$\text{RoTC (Return on Total Costs)} = \frac{\text{Operating Profit (EBIT)}}{\text{Sales} - \text{Operating Profit (EBIT)}}$$

6. Results and influential factor analysis

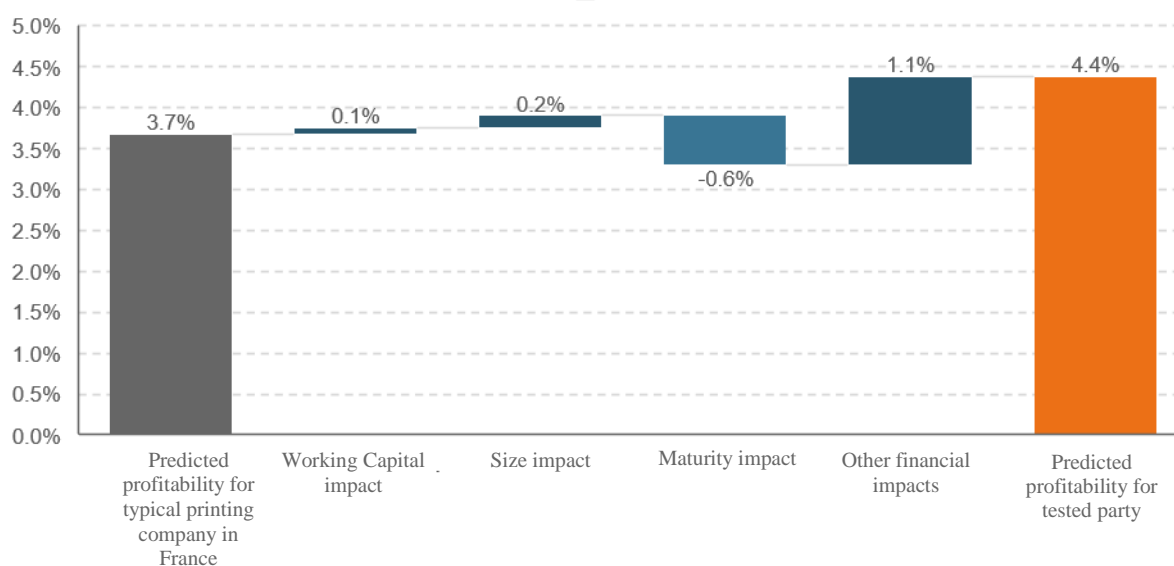
Based on the approach detailed above, the range for the normative profitability of the tested party is presented in the table below:

Table 3 – Predicted interquartile range for the return on total costs

RoTC Weighted average 2014-2016	
1 st quartile	0.3%
Median	4.4%
3 rd quartile	6.5%

Impacts of key parameters used in the estimation are presented below. More precisely, the graph below compares the estimation as retrieved by TP qube's statistical model given the parameters provided in table 2 with the model estimation for a *typical* observation in the same country and industry as the tested party¹, i.e. in the printing industry in France. The graph below presents the factors explaining differences between our estimation for the median profitability for a company with the same characteristics as the tested party and our estimation for the median profitability for a *typical* observation in the printing industry in France.

Figure 1 – Influence of key factors in explaining the difference with a typical observation in the printing industry in France



¹ The typical observation is an observation belonging to the same industry and country as the target, but for which all other characteristics are fixed at the median level (for the set of observations belonging to the same industry and country).



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