Quantitative VCA based on industrywide data sets

The quantitative version of your value chain analysis (data from the industry)

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Transforming the World of Tax

Agenda

01 VCA 1.0 and 2.0 Recap

02 VCA 3.0. Approach and steps

03 Case Study

VALUE CHAIN ANALYSIS

WEBINAR SERIES

TPA Global

VCA 1.0 and 2.0 Recap

Value Chain Analysis: Definition

- The **entire performance process of a company**, from R&D to delivery to end consumers.
- There is no **100 % objective method** to conduct a value chain analysis.
- Each VCA should start with **identifying the value chain within the industry.**
- Mapping the "value creation" requires identifying and separating **the value-creating activities of an MNE**.
- Value chain linkages should **contain evidence in the relevant context**. E.g., prices, cost premiums, margins, etc., are considered reasonable.

VCA 1.0 – The qualitative version of your value chain analysis

VCA 2.0 – The quantitative version of your value chain analysis (data from MNE)

VCA 3.0 – The quantitative version of your value chain analysis (data from the industry)

What is VCA 2.0 and where to use it?

- VCA 2.0 is a quantitative value chain analysis, which is presented as a corroborative method for transactional transfer pricing using the available data of the Group. It should not be confused with the profit split method.
- To make the quantitative VCA more objective, TPA uses the following anchors:
  - Regulatory and OECD anchor – country's regulations requirements;
  - Industry anchor – variables/value drivers that have an economically significant impact on your EBIT.
- VCA 2.0 has been used by TPA for our clients for the following purposes:
  - Implementation of Tax/TP system;
  - Documentation of Tax/TP system;
  - Defense/controversy management of Tax/TP system;
  - Establish the link between strategy/business model versus Tax/TP

VCA 3.0 Approach and steps

Approach

- The VCA 3.0 approach can be seen as **complementary** to the existing transactional transfer pricing methods.
- It allows to add **objectivity** to the current way a VCA is performed based on the guidance of the OECD, through the introduction of statistical and econometrical checks.
- The approach intends to **identify the value drivers that have a relevant impact on the EBIT** of an organization, which can be used as **allocation keys to the residual profit**.

Steps of VCA 3.0

1. Economic analysis
    - Selection of economically relevant **variables** in certain industry.
    - Creating a representative sample of active **companies** in this industry.
2. Statistical and econometric analysis
    - **Correlation analysis** to check whether there is a linear relationship between the variables, mainly the dependent versus the independent variables.
        - The **dependent** variable is the main factor that you're trying to understand or predict. In our case, the EBIT.
        - The **independent variables** are the factors that you suspect have an impact on your dependent variable (revenue, FTEs, COGS, OPEX, etc.). The independent variables are also known as explanatory or predictor variables.
    - Variable passing the economic and linear correlation test can be used to start a **regression analyses** to create a significant model with significant variables.
3. Connection to the value chain
    - The significant variables resulting from the regression analysis need to be connected with the value chain of the industry to check if they are in line, so the variables could be used as **allocation keys** to the residual profit of the organization.

Case Study: Fast-Fashion Apparel Industry

VCA 3.0 Analysis performed

So far, we have run two **different VCA 3.0 analysis** on the Apparel Industry data referred to different years:

- **Model 1** was developed on data from FYs 2013 -2017
- **Model 2** was developed on data from FYs 2015-2019.

The following slides will refer to the most recent analysis (Model 2) unless otherwise specified.

Model 1

- FYs 2013 -2017

Model 2

- Fys 2015-2019

Fast- Fashion Apparel Value Chain

A value chain of the apparel industry summarized

#1	#2	#3	#4	#5	#6
• design standard (t-shirt) • design originals	• select suppliers/fabric/textiles • negotiate • purchase agent	• own versus third party production • manage production process • decide on inventory levels • agree on supply chain	• execute on flow of goods • select and contract warehouse/transport capacity	• run marketing campaign • set up omni-channel strategy	• bricks or clicks • customer journey • pricing strategy and executions • mark-down policy

1. Economic analysis for Fast- Fashion Apparel industry

Total of 15 independent variables which drive the dependent variable EBIT:

List of independent variables	
Capital Expenditure	R&D Expenditure
Cost of Goods Sold	Revenue
Financial Assets	Tangible Assets
Intangible Assets	Total assets
Inventory	Total Costs
Marketing Costs	Total Equity
Number of FTEs	Wage Expenses
Operational Expenses	

74 instances with consist of 15 companies and 5 years (from 2015 to 2019)*

List of Companies	
Nike	PVH
Inditex	Ralph Lauren
Adidas	Puma
H & M	Under Armor
Fast Retailing Co / UNIQLO	American Eagle Outfitters
GAP	Abercrombie and Fitch
VF Corporation	Esprit
L Brands	

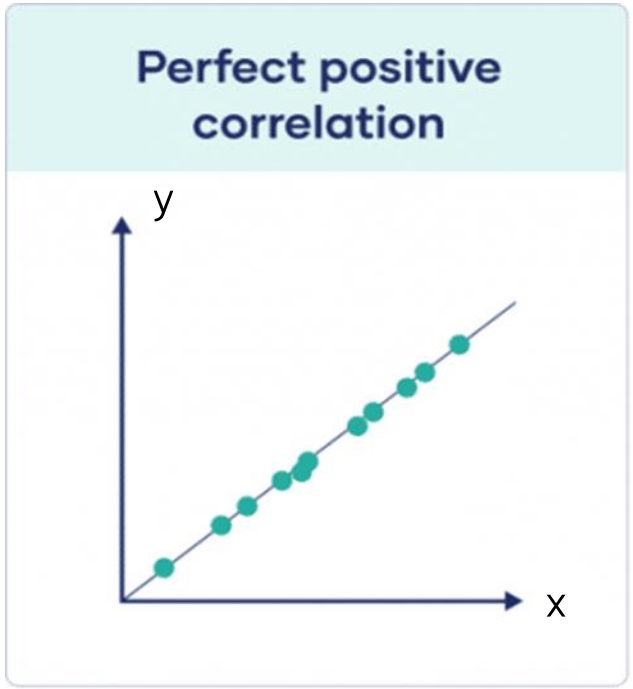
* VF Corporation FY2018, has been excluded from the research due to the fact that VF Corporation had a bookkeeping transition FY2018, meaning their FY2018 consisted of only three months. This would corrupt the data and is therefore excluded from the data.

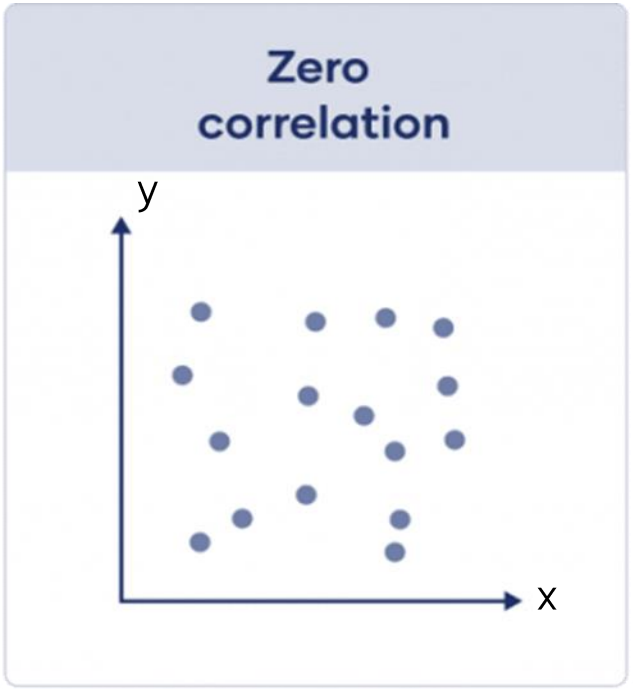
Dataset (partial view)

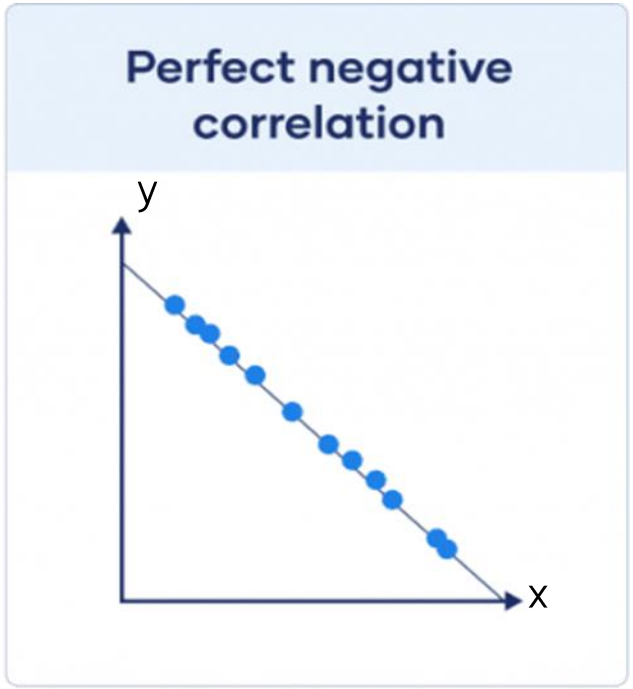
#	Company	Year	Capital Expenditure	Cost of Goods Sold	Financial Assets	Intangible Assets
1	Nike	2019	€ 960.405.000	€ 19.335.856.200	€ 8.331.848.400	€ 390.415.800
2	Nike	2018	€ 1.012.034.400	€ 17.325.791.600	€ 8.891.324.000	€ 372.096.400
3	Nike	2017	€ 1.065.287.000	€ 16.886.706.000	€ 10.979.286.000	€ 374.314.000
4	Nike	2016	€ 1.076.544.900	€ 16.012.606.578	€ 9.883.242.600	€ 372.406.800
5	Nike	2015	€ 904.605.700	€ 15.041.112.566	€ 10.700.141.600	€ 371.582.800
6	Inditex	2019	€ 1.130.000.000	€ 12.479.000.000	€ 8.113.000.000	€ 617.000.000
7	Inditex	2018	€ 1.609.000.000	€ 11.329.000.000	€ 6.815.000.000	€ 525.000.000
8	Inditex	2017	€ 1.756.000.000	€ 11.076.000.000	€ 6.240.000.000	€ 919.000.000
9	Inditex	2016	€ 1.400.000.000	€ 10.031.980.000	€ 5.358.000.000	€ 911.250.000
10	Inditex	2015	€ 1.542.000.000	€ 8.811.140.000	€ 4.189.000.000	€ 888.260.000
11	Adidas	2019	€ 711.000.000	€ 11.347.000.000	€ 5.681.000.000	€ 2.406.000.000
12	Adidas	2018	€ 794.000.000	€ 10.552.000.000	€ 5.595.000.000	€ 2.285.000.000
13	Adidas	2017	€ 764.000.000	€ 10.510.000.000	€ 4.311.000.000	€ 2.180.000.000
14	Adidas	2016	€ 651.000.000	€ 9.383.000.000	€ 4.444.000.000	€ 3.260.000.000
15	Adidas	2015	€ 513.000.000	€ 8.748.000.000	€ 4.216.000.000	€ 3.210.000.000
16	H&M	2019	€ 1.036.509.580	€ 10.419.126.920	€ 1.927.267.380	€ 1.081.378.080
17	H&M	2018	€ 882.165.920	€ 9.704.507.760	€ 1.916.658.080	€ 937.947.360
18	H&M	2017	€ 660.335.410	€ 10.346.742.700	€ 1.718.159.310	€ 731.133.830
19	H&M	2016	€ 482.549.220	€ 9.810.531.000	€ 1.710.529.740	€ 564.964.020
20	H&M	2015	€ 346.987.850	€ 8.914.754.100	€ 1.982.482.200	€ 440.016.950

2. Statistical and econometric analysis

A **linear correlation analysis** is a statistical method that is used to discover if there is a linear relationship between two variables, and how strong that relationship may be, allowing the identification of **usable variables** in connection with each other as the OECD intended.







Source: https://www.scribbr.com/statistics/correlation-coefficient/

2.1 Correlation matrix (I)

Correlation Matrix	EBIT	Capital Expenditure	Cost of Goods Sold	Financial Assets	Intangible Assets	Inventory	Marketing Costs	Number of FTEs	Operational Expenses	Revenue	Tangible Assets	Total assets	Total Costs	Total Equity
EBIT	100,00%													
Capital Expenditure	88,30%	100,00%												
Cost of Goods Sold	89,00%	81,20%	100,00%											
Financial Assets	84,80%	72,70%	80,40%	100,00%										
Intangible Assets	-7,12%	-10,29%	-9,80%	-9,69%	100,00%									
Inventory	79,10%	69,70%	92,60%	74,30%	2,09%	100,00%								
Marketing Costs	79,00%	71,90%	79,90%	86,90%	4,42%	88,50%	100,00%							
Number of FTEs	68,80%	78,50%	65,80%	34,70%	-10,28%	46,90%	21,59%	100,00%						
Operational Expenses	88,80%	84,10%	91,10%	77,10%	-0,12%	92,20%	86,90%	65,70%	100,00%					
Revenue	93,40%	85,90%	98,10%	82,50%	-6,52%	93,30%	84,10%	68,20%	96,90%	100,00%				
Tangible Assets	84,70%	90,80%	71,30%	62,80%	-15,50%	56,30%	64,40%	87,00%	79,60%	78,60%	100,00%			
Total assets	89,90%	82,70%	88,30%	82,10%	15,98%	85,20%	79,70%	60,30%	92,80%	92,90%	75,70%	100,00%		
Total Costs	90,90%	84,20%	98,50%	80,80%	-5,93%	94,50%	84,00%	67,20%	96,90%	99,80%	76,40%	92,10%	100,00%	
Total Equity	86,80%	78,80%	73,00%	77,00%	4,37%	73,30%	72,80%	54,00%	86,20%	82,50%	76,40%	88,80%	80,10%	100,00%
Number of Observations	74	74	74	74	69	74	64	74	74	74	74	74	74	74

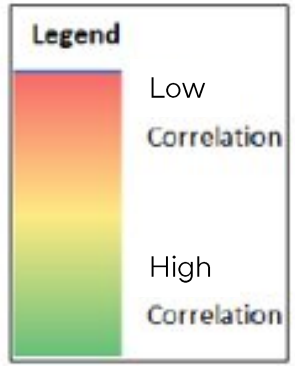
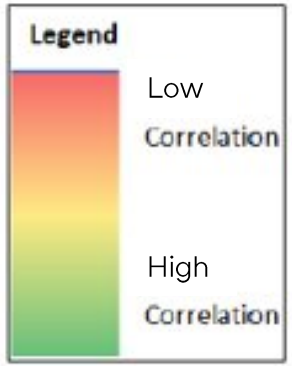


Figure 4 – Correlation Matrix for the Fast-Fashion Apparel Industry

2.1 Correlation matrix (II)

Correlation Matrix	EBIT
EBIT	100,00%
Capital Expenditure	88,30%
Cost of Goods Sold	89,00%
Financial Assets	84,80%
Intangible Assets	-7,12%
Inventory	79,10%
Marketing Costs	79,00%
Number of FTEs	68,80%
Operational Expenses	88,80%
Revenue	93,40%
Tangible Assets	84,70%
Total assets	89,90%
Total Costs	90,90%
Total Equity	86,80%
Number of Observations	74



2.2 Economical and Statistical Relevance of Variables (I)

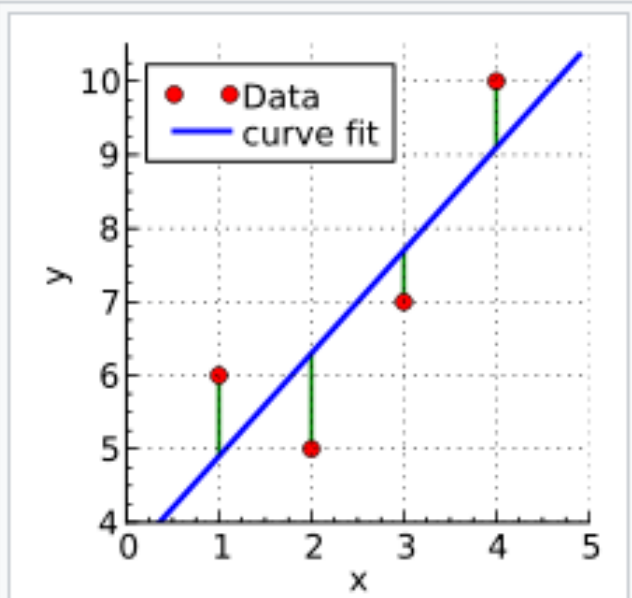
#	Variables	Econometric and Statistical relevance	Economic relevance	Included in the analysis	
				Econometric and Statistical Relevance	Economic Relevance
1	Capital Expenditure	Exclude due to its multicollinearity with Total Assets.	Relevant for industries that are capital intensive. CAPEX is an indicator of tangible assets.		X
2	Cost of Goods Sold	No reason to exclude	COGS is an indication of sales, higher COGS generally means higher sales.	X	X
3	Financial Assets	Exclude due to its multicollinearity with Total Assets.	Indicators of the size/value of the company.		X
4	Intangible Assets	Exclude due to not being significant with either of the variables nor any correlation.	Indicator for the size / reputation of the company. More intangibles could show more awareness of the brand or better quality, leading to more sales.		X
5	Inventory	Exclude due to its multicollinearity with Total Assets.	Indicator of the goods that are ready to be sold. Can indicate the size of a company.		X
6	Marketing Expenses	No reason to exclude	Positive effect on EBIT, more marketing should lead to more sales.	X	X
7	Number of FTEs	No reason to exclude	Manual labor-heavy industries benefit more from large amounts of FTEs in people-based industries.	X	X
8	Operational Expenses	No reason to exclude	Indicates the expenses for the maintenance and administration of a business on a day-to-day basis.	X	X
9	R&D Expenditure	Excluded due to insufficient data.	Indicates the amount spent to R&D. Usually positive effect on EBIT by making the company more advanced in this industry.		
10	Revenue / Sales	No reason to exclude	EBIT can be derived from sales as the difference between EBIT and sales are the costs.	X	X

2.2 Economical and Statistical Relevance of Variables (II)

#	Variables	Econometric and Statistical relevance	Economic relevance		
				Econometric and Statistical Relevance	Economic Relevance
11	Tangible Assets	Exclude due to its multicollinearity with Total Assets.	Amount of physical assets held by a company. Indicates of the size of the company		X
12	Total assets	No reason to exclude	The total amount of assets a company holds. Indicates the size of a company.	X	X
13	Total Costs	Excluded due to the fact that it depends too much on COGS and OPEX which leads to multicollinearity.	Sum of OPEX and COGS, another indication of the effect of costs on EBIT.		
14	Total Equity	Exclude due to multicollinearity with Total Assets.	Indicates the amount of money that would be returned to a company's shareholders. It represents the value of a company.		
15	Wage Expenses	Excluded due to insufficient data.	Indicates if the industry is people or capital based. Directly connected to the amount of FTEs.		

2.3 Linear Regression Model (I)

- In statistics, **linear regression** is a linear approach for modelling the relationship between a dependent variable and one or more independent variables. As previously explained:
  - The **dependent variable** is the main factor that you're trying to understand or predict. In our case, the EBIT.
  - The **independent variables** are the factors that you suspect have an impact on your dependent variable. The independent variables are also known as explanatory or predictor variables.
- By interpreting the statistical results of the model, you can understand how changes in the independent variables are related to shifts in the dependent variable.
- The greater the change in the dependent variable, the greater the **significance** of the independent variable as a predictor variable.



In linear regression, the observations (red) are assumed to be the result of random deviations (green) from an underlying relationship (blue) between a dependent variable (y) and an independent variable (x).

Source: https://en.wikipedia.org/wiki/Linear_regression

2.3 Linear regression (II)

- As previously mentioned, we have run two different regressions analysis on the Apparel Industry, the first one on data from FYs 2013 -2017 (Model 1) and the second one on data from Fys 2015-2019 (Model 2).
- The significant predictor variables for EBIT under Model 1 and Model 2 are very similar, but not the same exactly .
  - Model 1: Total assets, FTE's, OPEX, COGS and marketing expenses.
  - Model 2: Total assets, FTE's, OPEX, COGS and revenue.

2.3 Linear regression. Change of dynamics in Fast Apparel (I)

The linear regression lets us know how much the value of the dependent variable changes when one of the predictor variables is increased by one unit of measurement.
So, **what happens to EBIT if the independent variables are increased by one unit of measurement?**

Model 1
FY 2013 –2017

	Dependent variable:
VARIABLES:	EBIT
Total assets	0.088*
Marketing expenses	1.421***
FTEs	16,278.810***
OPEX	-0.262***
COGS	0.215**
Observations	55
R^2	0.808
Number of companies	11

Model 2
FY 2015 –2019

Predictor Variables	*b*-Value
Cost of Goods Sold	-,91
Number of FTEs	628,10
Operational Expenses	-0,97
Revenue	0,94
Total Assets	0,02
Constant	6.345.739,21

2.3 Linear regression. Change of dynamics in Fast Apparel (II)

- Traditional value drivers like the number of employees or physical stores are no longer as relevant as some years ago.
- The rise of e-commerce and online shopping has shifted the focus to the omnichannel approach and customer journey. Companies must invest in technology, logistics, and a deep understanding of customer behavior and preferences to provide a seamless customer experience across multiple channels.

3. Connection to the value chain

The predictor variables resulting the regression model (Total assets, FTE's, OPEX, COGS and revenue) should be connected to the value chain to be economically useful.

#1	#2	#3	#4	#5	#6
• OPEX	• COGS	• OPEX • TOTAL ASSETS	• FTEs • OPEX • TOTAL ASSETS	• OPEX	• FTEs • OPEX • REVENUE

Key Takeaways

- There is **no 100 % objective** method to conduct a value chain analysis.
- VCA 2.0 is a quantitative value chain analysis based on **data from the MNE.**
- VCA 3.0 is also a quantitative value chain analysis but based on data from the **industry**.
- VCA 3.0 intends to identify the variables that have a relevant impact on the EBIT of an organization, which can be used as **allocation keys** to the residual profit.
- **VCA 3.0** adds **objectivity** to the current way a VCA is performed based on the guidance of the OECD, through the introduction of statistical and econometrical checks.
- Both VCA 2.0 and VCA 3.0 can be seen as a **corroborative** method for transactional transfer pricing.