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Evaluating and forecasting financial performance of Volkswagen Group

Bachelor's thesis

Programme International Business Administration, specialisation Finance & Accounting

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TABLE OF CONTENTS

ABSTRACT

Volkswagen Group is currently the biggest automotive manufacturer in the world with the sales of 10.78 million automotive vehicles in 2017. The automotive industry is affecting billions of people's life and the global economy tremendously and it is evolving at a fast pace. The automotive industry is constantly developing and changing due to the new technology, more efficient management decisions and because of increased competition within the industry.

This thesis is evaluating Volkswagen Group's financial performance using financial statement analysis method from the years 2013-2017. The data from Volkswagen's financial statement is benchmarked to results from Daimler AG, BMW AG and Toyota Motor Corporation in order to analyse the results within the industry. The aim of the study is to analyse Volkswagen Group's profitability, liquidity, solvency, operating efficiency and the stock valuation. The thesis will also analyse the Volkswagen Group's emission scandal ramifications to its financial performance.

In terms of profitability the overall results from the thesis indicate that BMW AG and Daimler AG have better results compared to Volkswagen AG and Toyota Motor Corporation. However Volkswagen have manage to get through the emission scandal relatively well and have increased its profitability and sales impressively from 2016. According to book value Volkswagen group's stock valuation is also lower compared to its performance than with the other examined companies.

Keywords: Financial statement, benchmarking, automotive industry, emission scandal

INTRODUCTION

Volkswagen group is the largest automobile manufacturer in Europe. This thesis will examine the financial performances of Volkswagen Group and give thorough evaluation of the performances. The future of Volkswagen Group is interesting and worth investigating since the car industry will change a lot in the near future. Electric cars will be more common, self-driving vehicles are coming to market and legislations are constantly changing. Car industry is constantly rising, however it is important to identify the possible risks the market holds.

Evaluation of financial performance is crucial for the success of a company. In order to achieve solid growth and development the company has to have a good management and effective performance decisions. The financial data is collected from the financial statements and used to analyze performance on different sectors and analyzing how to improve the results. It is recommended for the companies to check and do through the financial statements regularly in order to avoid poor strategical choices because of uncertainty of the company's financial state.

Financial ratios are common and effective way to evaluate company's financial performance. Financial ratios are magnitudes that are calculated from two selected values taken from company's financial statement. Financial analysts use financial ratios to find strenghts and weaknesses concerning the financial health of the company and to compare the data with other companies within the industry (Droppelli, 2000). Financial ratios can have industry based differences so it is more effective to evaluate the financial ratios with companies in the same industry.

This thesis will give a financial evaluation of Volkswagen Group compared to its biggest rival companies. Volkswagen Group is the biggest car manufacturer in Europe which is why it is interesting to make research of it. Furthermore Volkswagen group also invest a lot on electric vehicles and to Asian market and tries to expand quickly and keep up with the future technology. This thesis will also look how the Volkswagen emission scandal affected to its performance and stock price and analyze the future performance of Volkswagen from an investor perspective.

Research aim and questions

The aim of the thesis is to uncover financial performances of Volkswagen Group LTD and evaluate and forecast the data in order to provide useful information for stakeholders and the company. Financial ratios are widely use to analyse the financial performance of Volkswagen compared to its biggest competitors on the market. The aim with the ratios is to find out how profitable and financially stable Volkswagen is in the car industry. The data for financial ratios is mostly taken from annual reports. This research focuses on Volkswagen Group's performance from 2013 to 2017 and strive to analyse the future performance of Volkswagen group as thorough as possible.

The research problem of the thesis is: How profitable and financially stable Volkswagen Group is in the car industry?

Both corporate finance and investment finance perspectives are evaluated in the thesis.

The research questions the thesis will also cover are:

1. Is Volkswagen Group LTD financially stable and potential entity to invest in and what does the future hold for Volkswagen Group LTD?

2. How Volkswagen Group uses its financial resources?

Hypothesis

1. Volkswagen Group's stock is undervalued
2. Volkswagen has strong and stable financial fundamentals

Significance

Financial ratios are one of the most used financial analysis tools. The ratios give a mathematical value between two items. The two values have to be related somehow to achieve useful comparisons (Bajkowski, 1999). From corporate finance perspective, managers can use financial ratios to evaluate what solutions are best for the company and how to implement new strategies and management changes. Employees can also use financial ratios to check how financially stable

the company they are working on do they afford to pay the employees income and pensions in the future. Furthermore the investors can analyse and predict the future financial state, growth of the company and how risky their investment would be. Creditors also benefit from financial statement analysis since they can show the company's ability to pay its debts now and in the future. Government can also use financial ratios to map out to which companies or industry financial support is given and how the support by government influences other industries. From horizontal analysis investors and other interested parties can see the causes of positive or negative financial performance. Evaluating Volkswagen's financial performance give the managers overall and useful knowledge of their financial status in the car industry and investors data that they can use in their investment decision making process.

Limitations

This thesis will mainly focus on evaluating the financial performance of Volkswagen Group through financial ratios and by investigating the income statement and balance sheet through horizontal analysis.

Methods

The data for this research is collected from Volkswagen Group's and its competitors, such as Daimler AG and Bayerishe Motoren Werke AG's annual reports. The timeline from which the financial performance is evaluated is from 2012 to 2017. Also previous articles and other websites are used to collect information.

This thesis is a financial data analysis which means that quantitative methods are used to calculatute the financial ratios and to analysing the changes in income statement and balance sheet using horizontal analysis. Financial statements such as income statement, balance sheet and cash flow statement are used for the calculations. The calculations include profitability ratios, liquidity ratios, solvency ratios, operating efficiency ratios and valuation ratios that will diversely give data from the performances from different financial areas. The ratios and data collected are then compared to other companies from the industry. This thesis uses charts and graphs to indicate Volkswagen group's financial results compared to companies in the same industry.

Structure

This thesis is divided into four chapters. The first chapter the thesis will explain the use of horizontal analysis and differentiate the uses and meanings of different financial analysis categories with the specific key ratios.

The second chapter gives an overview of the car industry. It includes Porter's five forces model which studies the competition in the automotive industry. The second chapter also gives an overview of the emission cheating scandal Volkswagen went through in 2015 and the ramifications of emission scandal.

The third chapter is financial statement analysis of the thesis. It will investigate Volkswagen Group's performance through horizontal analysis and key ratios. The analysis will differentiate the performance analysis in many financial sectors such as profitability, liquidity, solvency and valuation of Volkswagen group. The ratios are compared with Daimler AG's, BMW AG's and Toyota ADR's performance.

The fourth chapter is the conclusions. It includes main results, list of conclusions, proposals and ideas for further investigations.

1. Overview of the financial statement analysis methods

The overview of the financial statement analysis methods consist of explanation of the horizontal analysis and the most relevant financial ratios.

1.1 Horizontal analysis

Horizontal analysis is a financial statement analysis method that evaluates the changes in financial statements between studied years. With horizontal analysis it is efficient to evaluate a performance of a company and find out the reasons for positive or negative performance in different financial areas. With horizontal analysis entity is able to see actual data from consecutive years and compare every item of the financial statement separately (Vaidya, 2016).

Horizontal analysis of income stament examine the changes in revenue, expenses and the net profit of a company during the time evaluated (Merola, 2016). “The income statement is one of three financial statements that stock investors need to become familiar with (the other two are balance sheet and cash flow statement). Understanding an income statement is essential for investors in order to analyze the profitability and future growth of a company, which should play a huge role in deciding whether or not to invest in it” (Loth, 2017).

Horizontal analysis of balance sheet examine the differences between company’s assets, liabilities and shareholder’s equity from the studied period. Balance sheet is also used to calculate liquidity ratios of a company (Bragg, 2017). Balance sheet gives a snapshot of company’s financial position at the end of fiscal quarter or year. The amount of cash, receivables, fixed assets and debt changes between industries (Lan, 2016).

1.2. Financial ratios

Financial ratios are an effective way to evaluate the financial performance and situations of the company. The ratios give overall measures of the company's performance which can be easily compared to other companies rather than amounts listed in the financial statements. Financial ratios are easy to compare with different sized companies because the ratios are weighted averages from the information collected from the financial statements. Collecting data from financial statements is valuable for both internal and external parties of the company Financial ratios can be used by employees, suppliers, investors, owners and managers and by other sources that are interested in the company's performance (Delen, 2013). "Financial ratio analysis uses historical financial statements to quantify data that will help give investors a feel for a firm's attractiveness based on factors such as its competitive position, financial strength and profitability" (Bajkowski, 1999).

Evaluating financial ratios within the industry with other entities is called benchmarking. Benchmarking is crucial to get valuable information from the financial ratios because the results are measured industry-specifically.

When calculating the performance of a company, the financial ratios can be divided into six main categories:

Table 1. Financial ratios categories

Profitability ratios	Ratios evaluating the company's ability to get earnings from their operations. Examples of profitability ratios: Net Profit margin Gross profit margin ratio Return on equity

	Return on assets Return on capital employed
Liquidity ratios	Ratios evaluating company's ability to pay off its short-term debt. Examples of liquidity ratios: Quick ratio Current ratio
Solvency ratios	Ratios evaluating company's long-term ability to pay its debts and the interest the debt has. Examples of solvency ratios: Debt to assets ratio Debt to equity ratio
Operating efficiency ratios	Ratios evaluating how well company can use its assets compared to liabilities and generate profit. Examples of operating efficiency ratios: Cash conversion cycle Inventory turnover days' sales in inventory

Valuation ratios	Ratios evaluating stocks current and future market value. Examples of market Valuation ratios: Price to earnings ratio Price to book ratio Price to sales ratio Dividend yield

Source: Table made by the author

1.1.1. Profitability ratios

Profitability ratios are ratios that measure company's ability to earn profit after expenses. Company's profitability is important for stockholders and creditors, because the revenue the company earns is given to shareholders in form of dividends and with profit company can cover its debts. Profitability ratios are common and an effective way to measure company's performance.

Most common profitability ratios are net profit margin, gross profit margin ratio, return on assets and return on equity. Net profit margin is the ratio between net income and revenue. The ratio shows how well company can get profit from their sales after taxes.

Gross profit margin ratio calculates the ratio between sales minus costs of good sales divided by sales. Gross profit margin evaluates how well an entity uses materials and labour force to generate profits.

Return on assets compares net income to total assets. Return on assets is used to measure company management's effectiveness in generating profits by using its assets (Heikal, 2014).

Return on equity evaluates the amount of net income to shareholder's equity. "When a company has a low Return on equity, it means that the company has not used the capital invested by

shareholders efficiently. It reflects that the company is not in a position to provide investors with substantial returns" (Rekhi, 2016). Many analysts evaluate that minimum rate return on equity should be at least 15 percent when evaluating investment opportunities. However return on equity isn't perfect in all situations. When the value of shareholder's equity decreases it gives a big increase to the return on equity value without any enhancement in company's performance (McClure, 2017).

1.1.2. Liquidity ratios

Liquidity ratios are used to evaluate company's capability to pay off its current liabilities. It shows the how much company has cash and how well company can turn its assets to cash to pay liabilities and other obligations. Liquidity ratios are important measurements of company's financial health.

A liquid company has to have more current assets than current liabilities. High liquidity ratio values indicate that the company can more likely cover its short-term debts. Low liquidity ratio values may indicate that the company is having a trouble to finance its short-term obligations and long-term operations.

The most common liquidity ratios are current ratio, quick ratio and cash flow ratio. Current ratio is calculated by dividing current assets from current liabilities. Current ratio is also known as Working Capital. When current ratio is positive, it shows that the company is capable of paying its short-term debts even if some kind of financial catastrophe occurs. A negative current ratio value means that the company is not liquid.

Quick ratio is the same as current ratio but it exludes inventories from the current assets. Quick ratio focusses more on liquid assets than current ratio since inventories are not considered as a liquid asset, especially on car industry.

Cash flow ratio is a comparison between company's cash flows to current liabilities. Cash flow ratio measures how much company makes cash compared to its current liabilities.

1.1.3 Solvency ratios

Solvency ratios measures company's long-term financial health. Solvency ratios measures the

company's debt compared to assets and equity. Efficient solvency ratio values are a sign of a financially stable company in long-term.

Most common solvency ratios are debt to equity ratio and debt to assets ratio. Debt to equity ratios ís calculated by dividing company's total liabilities from its total equity. Debt to assets ratio is calculated by dividing total equity from total assets. Solvency ratios are important in determing the company's long-term financial health.

1.1.4 Operating efficiency ratios

Operating efficiency ratios measures how well a company can handle its assets and liabilities and generate profit. Better operating efficiency ratios indicate that the company can efficiently accumulate cash from the customers or turn inventory to sales.

Cash conversion cycle is one of the common operating efficiency ratios. It measures the time it takes for a company to get cash collections from its initial investment in working capital. According to Zeidan (2017), "Maximizing shareholder value depends on minimizing the CCC constrained by operating margins and sales".

1.1.5 Valuation ratios

Valuation ratios are ratios used by investors to evaluate investment opportunities by analysing the current and future value of stocks and what the company is worth. Valuation ratios are highly used in investment and stock websites since the ratios evaluate the possibility of under- or overvaluation of a stock compared to its performance.

The most used valuation ratio is the price to earnings ratio. It is considered as one of the quickest and easiest ways to determine company's overall growth rate and earning power (Kennon, 2018). Price earnings ratio is calculated by dividing market value per share by earnings per share. Like the name market value per share illustrate, it means the current price of the stock. Earnings per share is calculated by dividing net income minus dividends with number of shares outstanding.

Price to book value is also commonly used stock valuation ratio. Price to book value can indicate

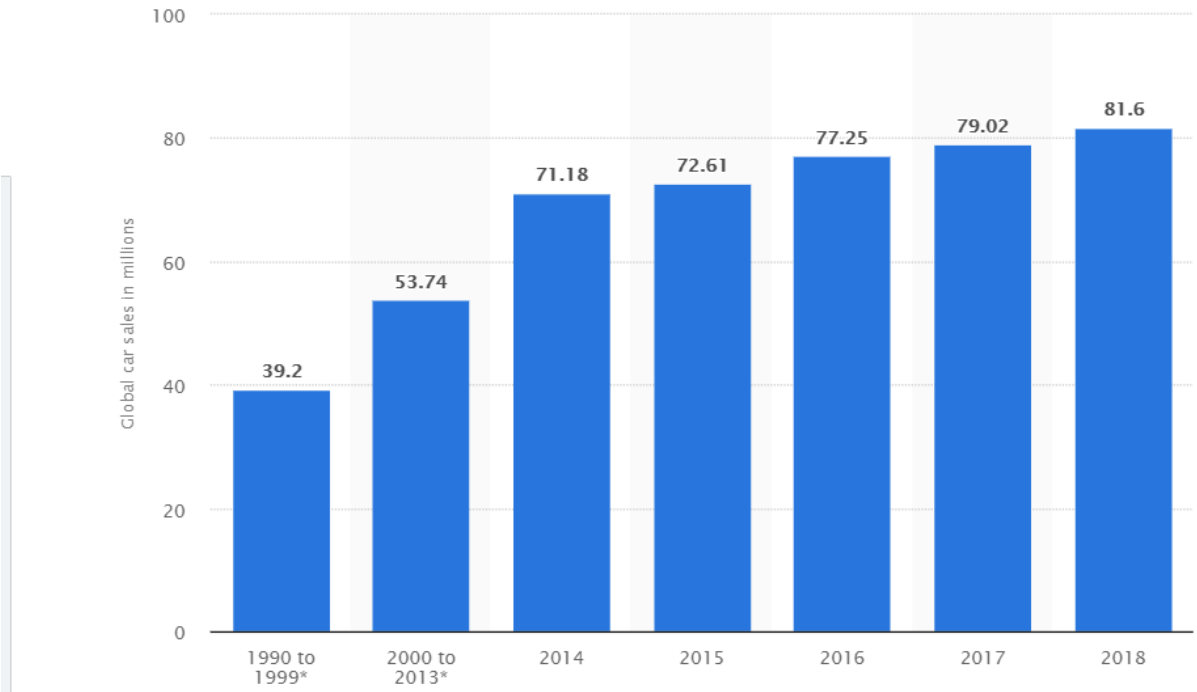
if the stock is under- or overvalued. It is calculated by dividing market price per share with book value per share.

The final valuation ratio researched in this thesis is the price to sales ratio. It evaluates the price of the company's stock with the company's revenues.

2. Car industry overview

Since owning a car has become more of a common commodity rather than a high class product that only rich can own, the car industry has been steadily increasing and it is forecasted that the industry will keep on rising in the future. Developed technologies, globalisation and increased amount of competition in the industry has made the prices of cars to go down tremendously compared to the economy. The amount of cars yearly produced has steadily increased about three percent every year from 2009 to 2017 (statista.com). It is expected that the amount of cars sold will continue to rise 3-4 percents in 2018 (statista.com).

Figure 1. Global car sales in millions



Source: Statista.com

The automotive industry employ over 12 million jobs in Europe, over 8 million in the US and over 5 million in Japan (mckinsey.com). The automotive industry has expanded all over the world affecting billions of people globally.

The economic growth in China has rised the car sales remarkably in the last fifteen years. From 2002-2016 the sales of cars, trucks and buses rose from 2 million vehicles to 28 million. Now the growth in China seems to be steadying from this outstanding growth since 2017 the car industry grew much slower rate of 3 percent (Perkowski, 2018).

2.1 Porter's five forces model: Automotive industry

Porter's five forces is an industry analysis model that analyses five forces that influence different industries. It helps companies to identify industry's strengths, weaknesses, opportunities and threats. It is used by company managers to construct a business strategy and evaluate the profitability expectations to future. To understand industry competition and profitability of the industry you must analyze the structure of the five forces: Barriers to entry, Suppliers power, threat of substitutes, buyers power and rivalry (Porter, 1979).

Below is a chart and explanations of car industry's five forces:

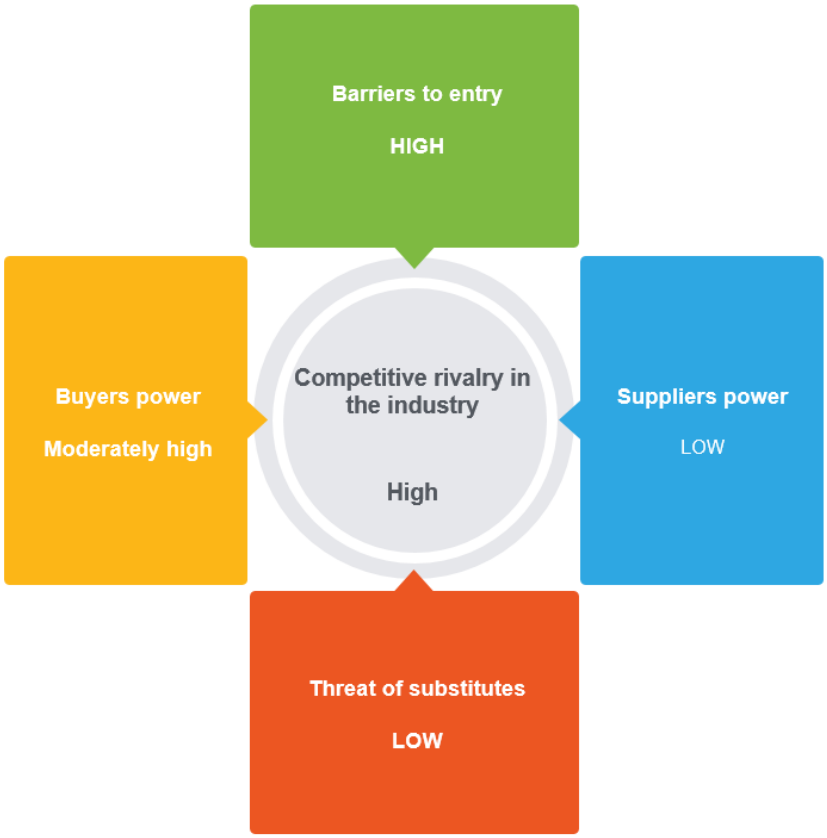


Figure 2. Porter's five forces: Automotive industry
Source: Porter (1979), author's evaluations

1. Barriers to entry; HIGH: It is hard for new companies to enter the car industry market since there are huge initial investments required to manufacture cars and pay other operational costs. Car industry is also highly competitive in many price levels which makes it hard to find a new market share to get unless the product is somehow different from other brands. Other factors such as brand image including reliability and quality of the cars are hard to market to customers since there are no long-time evidence of the new brand and its products (Pratap, 2017). It takes several years to for a new company to build a strong reputation to be competitive. Thus the existing multinational companies like Volkswagen group makes hard for new entrants to price their product competitively (ukessays.com, 2015).

2. Suppliers power; LOW: In car industry it is hard for supplier companies to pressure car companies by raising prices, lowering quality or reducing the availibility of certain parts or materials since the competition is hard among the big players in the industry (Wilkinson, 2013). The automotive companies has the possibility to buy another quite similar product from other

suppliers if the pricing model, quality or the features of the product doesn't please the brands. The raw materials are always available in plenty so changing supplier from one to another is not a problem (Pratap, 2017).

3. Threat of substitutes; LOW: In the automotive industry the threat of substitutes are concidered as other types of transportation that would reduce the marketshare of cars in the transportation industry. Other transportation includes for example buses, trains and taxes. Threat of substitutes for cars are low because public transportation doesn't give the same freedom of travelling and for many people car is a necessity product in order to get to their everyday places such as job, school supermarket etc. The global warming and the attention around greener future has risen the usage of public transportation and bikes all over the world but on the other hand rising economies like China has also boosted the car industry.

The smart mobility, including increases use of Mobility as a Service (MaaS) is still a marginal issue. However, in longer terms it is assumed that co-use of cars becomes more common and more and more people, especially in metropoles, do not own their own cars but use other transportation methods and services provided by others.

All in all the risk of substitutes are considered low because car is the most efficient transportation vehicle for middle class people and cars are getting cheaper so more people can afford having a car. There are no realistic substitutes for cars in the foreseeable future (ukessays.com).

4. Buyers power; MODERATELY HIGH: The competition among big players in the automotive industry is very competitive. There are a lot of similar product within the industry and it is easy for customer to change from brand to another. There are also a lot of information available of the substitute brands which lead automotive industry into battle of prices(Ferguson, 2017).

5. Competitive rivalry in the industry; HIGH: Like said above the competition in car industry is high. Car industry used to be categorized as an oligopoly but now because of new brands the automotive industry has become more competitive (Industry Hanbook: Automobiles). Automotive brands compete on price, technology, quality, design, customer safety and in several other sections (Pratap, 2017). Although the automotive companies focus on different customer groups and try to differentiate their product from the competitors, the competition is intensive because the limits of

a certain customer group differs and the automotive companies have to keep up in the evolution of automotive vehicles.

2.2 Overview of the companies

Volkswagen Group is a German corporation which consist of twelve brands including Volkswagen passenger vehicles, Audi, Seat, Škoda, Bentley, Bugatti, Lamborghini, Porche, Ducati, Volkswagen Commercial Vehicles, Scania and MAN (Volkswagenag.com). Volkswagen group operates in 153 countries and is the biggest automotive company with the sales of 10.78 million new vehicles. Volkswagen Group has a total of 642 300 employees by the end of 2017.

Daimler AG is also a German corporation which include brands of Mercedes-Benz cars, Daimler Trucks, Daimler Buses and Mercedes-Benz vans (Daimler AG annual report 2017). Daimler AG sold total of 3.3 million vehicles during 2017 and had a total of 289 300 employees under the corporation in the end of 2017.

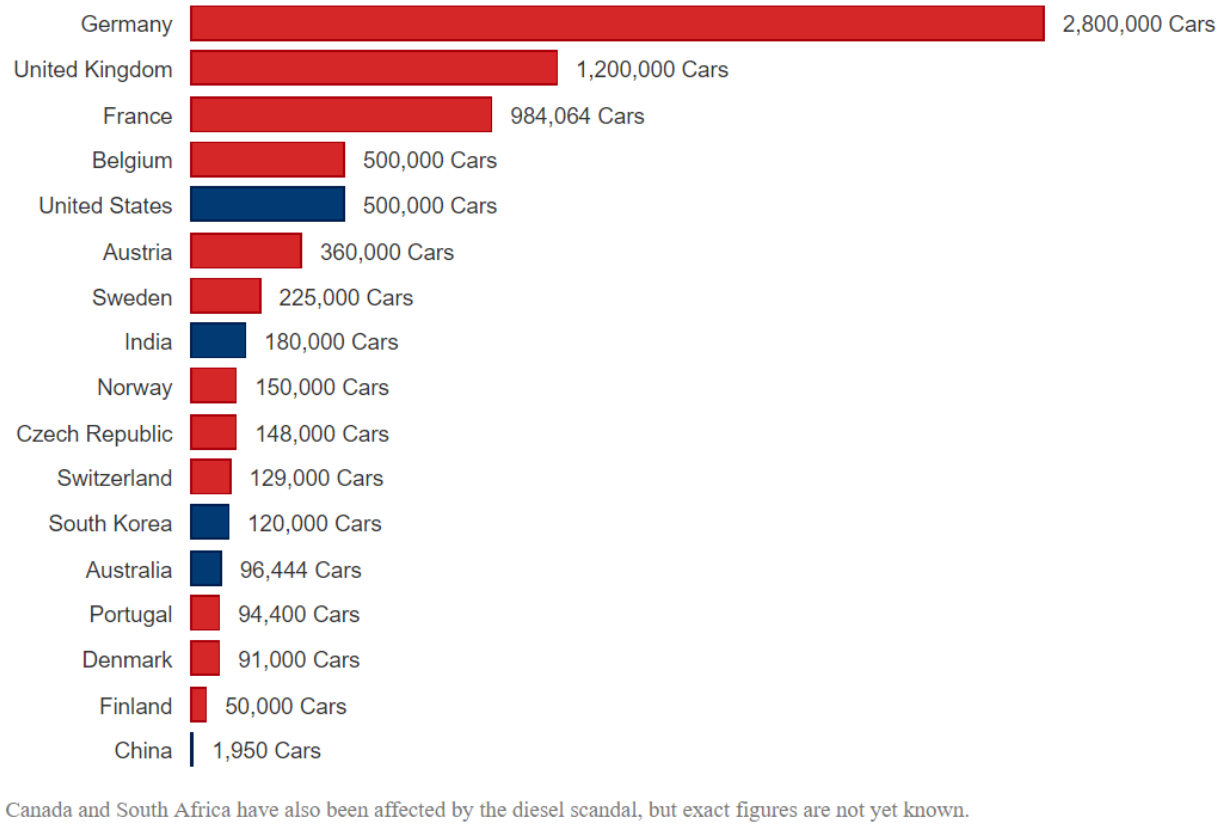
Bayern Motoren Werke Group (BMW Group) is the third German automotive corporation examined in the thesis. It includes the brands of BMW, MINI, and Rolls Royce Motor Cars. BMW group had total sales of 2.46 million automotive vehicles in 2017 and had total of 129 932 employees by the end of 2017.

Toyota Motor Corporation is the world's second biggest car manufacturer examined in the thesis. Toyota Motor Corporation operates under five brands including Toyota brand, Hino, Lexus, Ranz and Daihatsu. In 2017 Toyota Motor Corporation produced 10,5 million vehicles during 2017 and there are 364 500 employees under the Toyota Motor Corporation in 2017.

2.3 Volkswagen group emission scandal

In September 2015 U.S Environmental Protection Agency (EPA) filed a notice of violation to Volkswagen Group for manipulating the emissions tests results. Volkswagen group had fitted a software in diesel engines that could identify when the emissions were tested. In road use emissions were up to 40 times higher than the test results claimed (Hotten, 2015).

Figure 3. Amount of cars using illegal emission test bypassing software

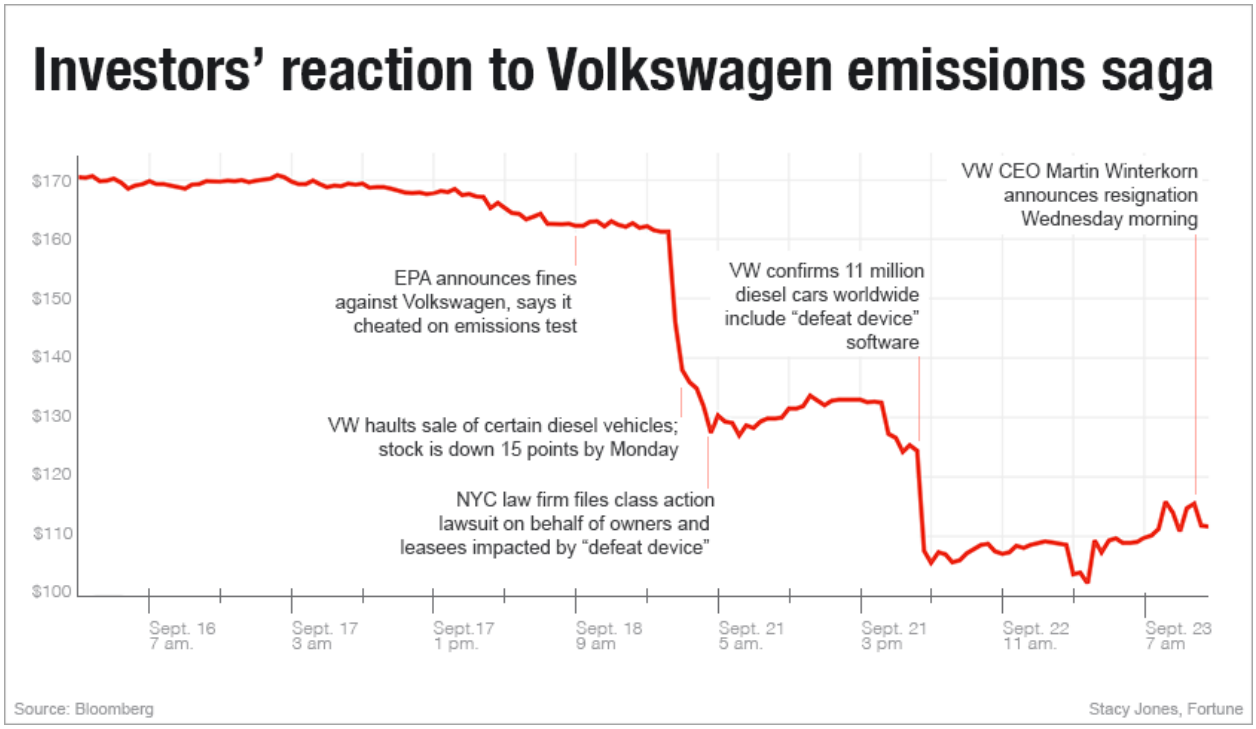


Source: Atiyeh (2017)

The Volkswagen Group's emission cheating device were fitted into 11 million cars worldwide between 2009-2015 (Baker 2018). Eight million of the cars were sold in Europe and around 500 000 in the US.

2.3.2 Ramifications

Figure 4. Short-term effect of emission scandal to stock price



Source: Snyder, (2015)

Investors reacted quickly to the emission scandal after EPA announced the fines for Volkswagen group of cheating on emissions test on Friday 18 of September 2015. After the weekend the stock market opened in 21 of September 2015, the stock price of Volkswagen group had already decreased by 15 percent. On The same day Volkswagen got sued by a NYC law firm and Volkswagen confirmed that the emission defeat device had been fitted into 11 million cars, which led the stock price to fall another 15 percent. During this four-day period the stock price of Volkswagen Group dropped from 160 dollars to 110 dollars. The Chief Executive officer Martin Winterkom announced his resignation just two days later (Snyder, 2015).

As of beginning of 2018, the cost of the emission scandal for Volkswagen LTD has so far been 25 billion euros (Baker, 2018). The biggest fines came from US where they demand Volkswagen to repurchase the sold vehicles that were attached with the illegal emission device or fix the vehicles if the owner so prefers. The overall settlement with the US cost Volkswagen Group 15 billion dollars (Riley, 2017)

3. Financial statement analysis

3.1 Horizontal analysis

Horizontal analysis of income statement:

Increases or decreases of negative amounts are stated as Inc(Increase) or Dec(Decrease) since it is impossible to calculate percentage changes of negative amounts.

VOLKSWAGEN AG INCOME STATEMENT									
Fiscal year ends in December. EUR in millions	2013-12	Inc/dec %	2014-12	Inc/dec %	2015-12	Inc/dec %	2016-12	Inc/dec%	2017-12
Revenue	197008	3 %	202458	5 %	213292	2 %	217268	6 %	230682
Cost of revenue	161407	3 %	165934	8 %	179382	-2 %	176270	7 %	188140
Gross profit	35601	3 %	36524	-7 %	33910	21 %	40998	4 %	42542
Operating expenses									
Sales, General & Administrative	26543	2 %	27133	13 %	30712	-2 %	30036	3 %	30964
Other operating expenses	-2441	12 %	-2739	Inc	4436	-41 %	2633	-171 %	-1865
Total operating expenses	24102	1 %	24394	44 %	35148	-7 %	32669	-11 %	29099
Operating income	11499	5 %	12130	Dec	-1238	Inc	8329	61 %	13443
Interest Expense	2366	12 %	2658	-10 %	2394	2 %	2437	-5 %	2317
Other income (expense)	3295	62 %	5322	-56 %	2331	-40 %	1400	99 %	2787
Income before taxes	12428	19 %	14794	Dec	-1301	Inc	7292	91 %	13913
Provision for income taxes	3283	13 %	3726	-98 %	59	3141 %	1912	19 %	2275
Other income					-1	0 %	-1		
Net income from continuing operations	9145	21 %	11068	Dec	-1361	Inc	5379	116 %	11638
Extraordinary items	-27	411 %	-138	54 %	-212	6 %	-225	22 %	-274
Other	-106	239 %	-359	21 %	-433	6 %	-460	21 %	-558
Net income	9066	20 %	10847	Dec	-1582	Inc	5144	121 %	11354
Net income available to common shareholde	9066	20 %	10847	Dec	-1582	Inc	5144	121 %	11354
Earnings per share									
Basic	18,63	17 %	21,84	Dec	-3,2	Inc	10,24	121 %	22,63
Diluted	18,63	17 %	21,84	Dec	-3,2	Inc	10,24	121 %	22,63
Weighted average shares outstanding									
Basic	486	2 %	496	1 %	501	0 %	501	0 %	501
Diluted	486	2 %	496	1 %	501	0 %	501	0 %	501
EBITDA	29444	16 %	34243	-39 %	20749	47 %	30522	25 %	38260

Table 2. Volkswagen group horizontal analysis: Income statement

Source: Morningstar Volkswagen Group AG, author's calculations

Volkswagen group has increased its revenues progressively from two to six percent per year in 2013-2017 from 197 billion to 230 billion. From 2014 to 2015 its gross profit decreased by 7 percent because the costs of revenue increased relatively higher compared to its revenue. In 2016 Volkswagen group was able to increase its gross profit because the revenues increased and Volkswagen group was able to reduce its cost of revenue. 2017 continues to be a better year for Volkswagen since the gross profit increased 4 percent from 40998 billion to 42542 billion.

The performance increased because Volkswagen increased its sales revenue in US and Canada market by 9,5% through volume and mix effects. Volkswagen Group's vehicle sales increased 3,7% percent from 2016 to 10,78 million vehicles. Volkswagen group had strong sales in South America where sales revenue rose by 25.3 percent due to higher volumes and positive mix effects (Volkswagen annual report 2017). The sales revenue in Asian market rose by 9,4 percent due to higher import volumes. (Volkswagen annual report 2017). Volkswagen managed to drop its total operating expenses from the 2015 peak by 17 percent in the end of 2017, which drove up the operating profit and net income.

Volkswagen group has moderately high sales, general & administration costs of approximately 30 billion in years 2015-2017. SG&A costs are covering 72,8 percent of the gross profit in 2017. 42.4 percent of the SG&A costs are research and development costs which is high number even in automotive industry. For instance Daimler AG's research and development (4 billion) is only 22% of its SG&A costs compared to Volkswagen Group's 13 billion in research and development. This is not a bad thing since automotive industry develop quickly and it shows that Volkswagen invest to its future operations. Volkswagen Group is going to invest over 34 billion to new technologies by the end of 2022 (Volkswagen annual report 2017). (Data source in text: Volkswagen annual reports 2013-2017).

Horizontal analysis of balance sheet:

VOLKSWAGEN AG BALANCE SHEET									
EUR in millions except per share data.	2013-12		2014-12		2015-12		2016-12		2017-12
Assets									
Current assets									
Cash									
Cash and cash equivalents	23178	-17 %	19124	9 %	20872	-8 %	19264	-4 %	18457
Short-term investments	10674	26 %	13469	39 %	18684	16 %	21695	-9 %	19725
Total cash	33852	-4 %	32593	21 %	39556	4 %	40959	-7 %	38182
Receivables	49519	13 %	55869	4 %	58021	7 %	61860	8 %	66503
Inventories	28653	10 %	31466	11 %	35048	11 %	38978	4 %	40415
Other current assets	10168	10 %	11174	14 %	12762	9 %	13925	8 %	15012
Total current assets	122192	7 %	131102	11 %	145387	7 %	155722	3 %	160112
Non-current assets									
Property, plant and equipment									
Gross property, plant and equipment	146769	12 %	163671	11 %	181950	10 %	199973	4 %	207796
Accumulated Depreciation	-82122	9 %	-89916	10 %	-98606	9 %	-107500	5 %	-113300
Net property, plant and equipment	64647	14 %	73755	13 %	83344	11 %	92473	2 %	94496
Goodwill	23730	-1 %	23577	0 %	23646	0 %	23559	0 %	23443
Intangible assets	35513	2 %	36358	3 %	37501	4 %	39040	2 %	39976
Deferred income taxes	5622	5 %	5878	37 %	8026	22 %	9756	1 %	9810
Other long-term assets	72629	11 %	80538	4 %	84031	6 %	89182	6 %	94356
Total non-current assets	202141	9 %	220106	7 %	236548	7 %	254010	3 %	262081
Total assets	324333	8 %	351208	9 %	381935	7 %	409732	3 %	422193
Liabilities and stockholders' equity									
Liabilities									
Current liabilities									
Short-term debt	37627	9 %	41177	14 %	46915	22 %	57388	-9 %	52502
Capital leases	50	-32 %	34	18 %	40	33 %	53	-4 %	51
Accounts payable	18023	8 %	19530	5 %	20461	11 %	22794	1 %	23046
Deferred income taxes	2869	-3 %	2791	-53 %	1301	0 %	1301	7 %	1397
Taxes payable	2068	11 %	2300	0 %	2303	35 %	3111	-12 %	2731
Other current liabilities	57988	12 %	64874	19 %	77469	20 %	92868	-13 %	80662
Total current liabilities	118625	10 %	130706	14 %	148489	20 %	177515	-10 %	160389
Non-current liabilities									
Long-term debt	60139	12 %	67074	7 %	71719	-12 %	63113	25 %	79085
Capital leases	363	0 %	362	19 %	431	13 %	486	-12 %	428
Deferred taxes liabilities	11568	-31 %	7989	5 %	8373	-1 %	8301	4 %	8666
Accrued liabilities	559	-6 %	527	26 %	663	13 %	750	13 %	844
Deferred revenues	702	-79 %	146	3 %	150	281 %	572	21 %	694
Pensions and other benefits	21796	37 %	29829	-8 %	27564	20 %	33047	-1 %	32768
Minority interest	2304	-91 %	198	6 %	210	5 %	221	4 %	229
Other long-term liabilities	18240	33 %	24189	49 %	36066	-9 %	32817	-9 %	30013
Total non-current liabilities	115671	13 %	130314	11 %	145176	-4 %	139307	10 %	152727
Total liabilities	234296	11 %	261020	13 %	293665	8 %	316822	-1 %	313116
Stockholders' equity									
Additional paid-in capital	1191	2 %	1218	5 %	1283	0 %	1283	0 %	1283
Retained earnings	72341	-2 %	71197	-3 %	69039	2 %	70446	16 %	81367
Accumulated other comprehensive inc	14201	24 %	17576	1 %	17738	18 %	20960	25 %	26199
Total stockholders' equity	87733	3 %	89991	-2 %	88060	5 %	92689	17 %	108849
Total liabilities and stockholders' equity	322029	9 %	351011	9 %	381725	7 %	409511	3 %	421965

Table 3. Volkswagen group horizontal analysis: Balance Sheet

Source: Morningstar Volkswagen Group AG, authors calculations

Between 2016-2017 Volkswagen group managed to increase its total assets and decrease its total liabilities, which is a positive trend. The total current and non-current assets both increased by 3 percent between 2016-2017 which gives Volkswagen Group total assets of 422 billion.

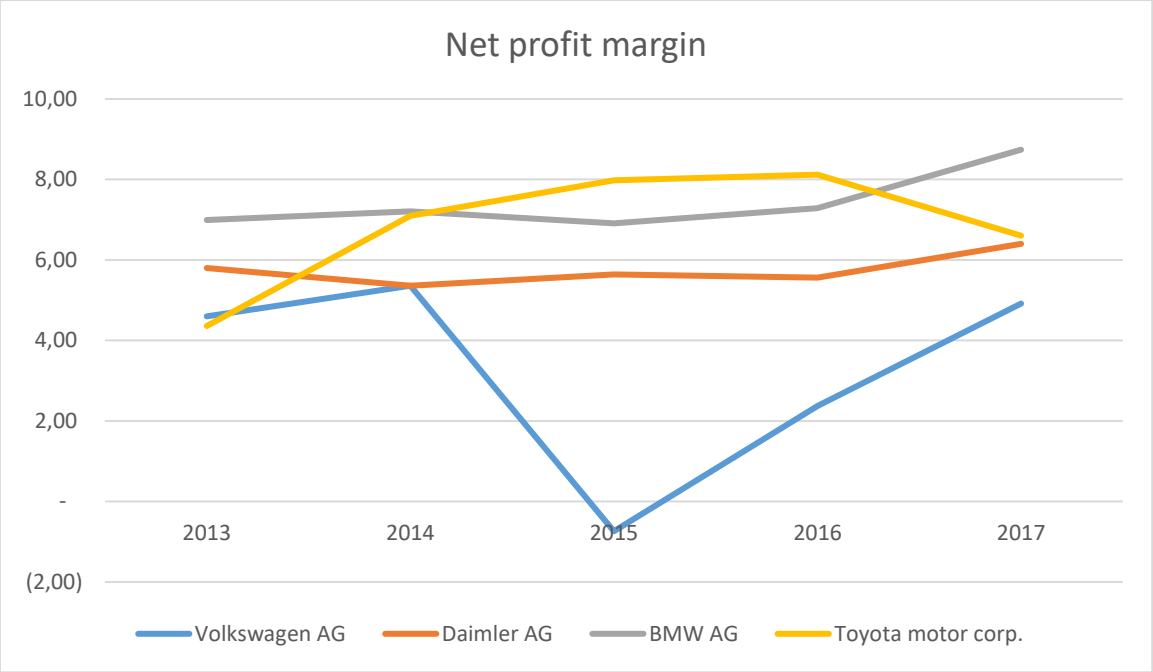
The current liabilities decreased by 10% in 2017 compared to previous year, however the non-current liabilities increased by 9 percent during the same period. Non-current liabilities were mainly the debt Volkswagen took to recover from the emission scandal and to keep on the business operations in full strength. Overall the total liabilities went down by one percent to 313 billion.

Volkswagen group has managed to drop its short-term debt by 9 percent from 2016 to 2017. Its long-term debt has increased by 25 percent between 2016-2017. Volkswagen Group is financing the future operations and also the costs occurred from the emission scandal more with long-term debt which is good for the Volkswagen Group's financial health since the interest rates are lower in long-term debt and the future operations are expected to bring profit for the organisation, which can cover the long-term debt expenses. Volkswagen's current liabilities decreased by 10 percent and its non-current liabilities rose by 10 percent which is a favourable move for Volkswagen's financial health and a good decision from the management. Because of the decrease in current liabilities Volkswagen has a better liquidity than year before.

Data source in text: Volkswagen annual reports 2013-2017

3.2. Profitability ratios

Net profit margin $= \frac{Net\ income}{Net\ revenue}$



Net profit margin	2013	2014	2015	2016	2017
Volkswagen AG	4,6	5,36	-0,74	2,37	4,92
Daimler AG	5,8	5,36	5,64	5,56	6,4
BMW AG	6,99	7,21	6,91	7,29	8,74
Toyota ADR	4,36	7,1	7,98	8,12	6,6

Figure 5. Net profit margin

Data Source: Morningstar.com

Net profit margin is a ratio that compares how company can turn its net income into profits after expenses including taxes. Volkswagen group's net profit margin dropped from 5.36 to -0.74 in 2015. The reason for the massive drop was the increasing financial costs occurred because of the emission cheating scandal. In 2016 Volkswagen's net profit margin has risen to 2.37 and in 2017 to 4.92, which is near the level it was in 2014. BMW AG has the most impressive timeline of net profit margin which has been close to seven percent in 2013-2016 and in 2017 over eight percent. Toyota ADR's and Daimler AG's net profit margin in 2017 was a little over six percent. Volkswagen Group has the lowest net profit margin compared to its competitors but still Volkswagen has impressively enhanced its net profit margin in recent two years and the beginning of 2018 indicate that the net profit margin will continue to rise.

$$\text{Gross profit margin} = \frac{Revenue - Cost\ of\ goods\ sold}{Revenue}$$

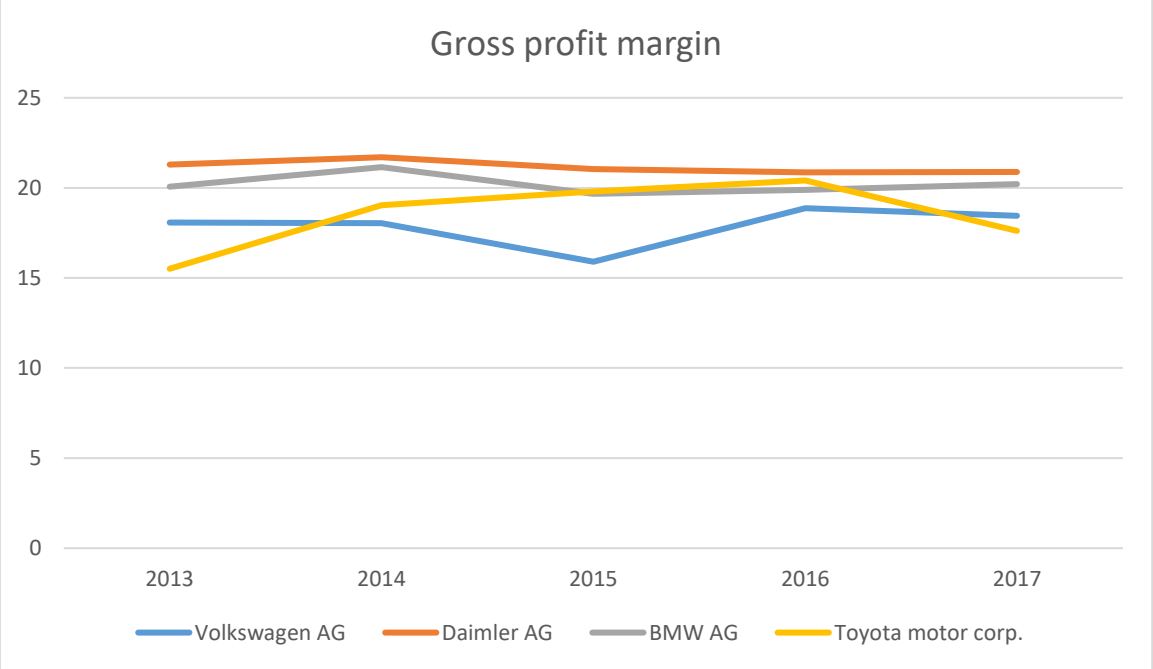


Figure 6. Gross profit margin

Data source: Morningstar.com

All the entities researched have a stable gross profit margin between 17 to 21 percent. The decrease of 15,6 percent in gross profit margin of Volkswagen group in between 2014 and 2015 isn't as aggressive as the decrease in net profit margin since gross profit margin takes only the costs of goods sold into account. Volkswagen managed to rise its gross profit margin near the levels of its competitors with its enhanced sales in 2016 and 2017. Volkswagen Group's low labour force efficiency is adding the costs of goods sold. Volkswagen group has more employees compared to its sales which indicate that Volkswagen group should cut down employees and add its labour force efficiency through management decisions.

$$\text{Return on equity} = \frac{Net\ income}{Shareholder's\ equity}$$

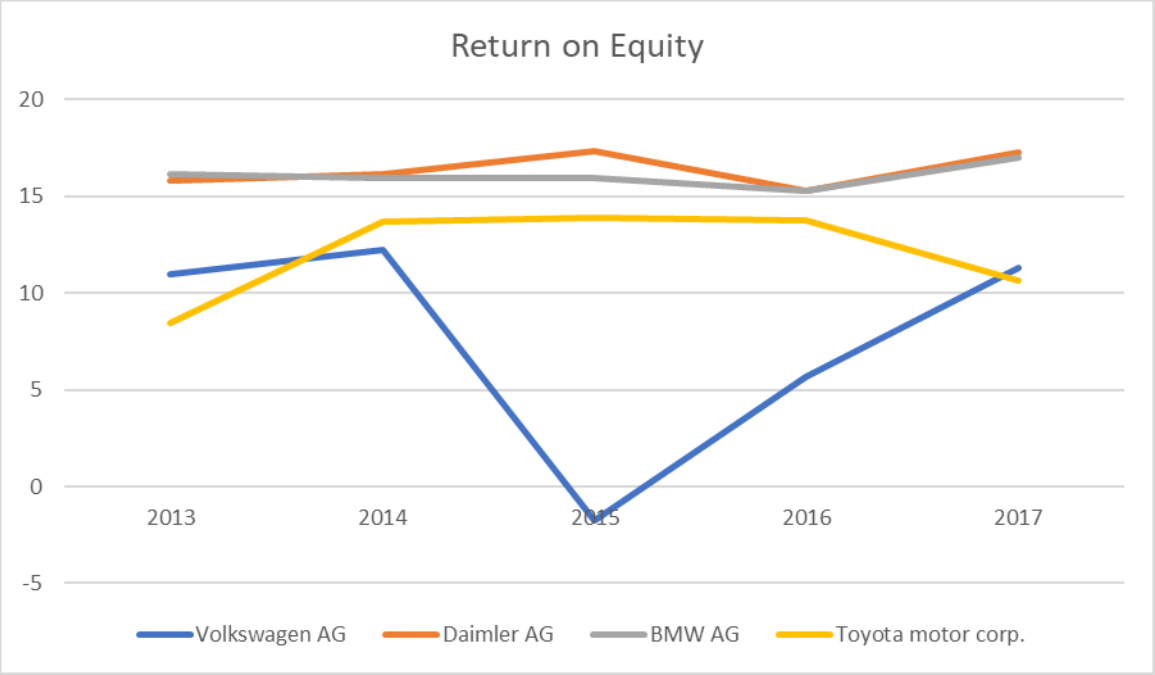


Figure 7. Return on equity

Data source: Morningstar.com

The average return on equity of Volkswagen group is for 2013-2017 is 7.67 percent while its German rivals average return on equity is over fifteen percent. Return on equity follows the trends of net profit margin which can be seen clearly in this chart. The huge financial costs decreased the net income of Volkswagen AG in 2015 which decreased the shareholder's equity.

Return on equity can be divided into component analysis, also known as du pont analysis to see

what is the more specific reason for the companies' results in return on equity. The dupont analysis is calculated: profit margin x asset turnover x equity multiplier.

The main reason driving Volkswagen Group's return on equity down is the profit margin. As you can see from the first chart where the profit margin is examined, Volkswagen group's net profit margin in 2017 is 4.92, when BMW AG's and Toyota's profit margin is around 6.5 and Daimler's at 8.7.

The asset turnover of Volkswagen Group has dropped from 0.62 to 0.55 in 2013-2017 which is a unfavourable change for Volkswagen. The asset turnover of BMW AG(0,52) and Toyota Motor Corporation(0.57) is close to Volkswagen Group's asset turnover. Daimler AG has the highest asset turnover of 0.66 in 2017 which means it can generate more sales per dollar of assets.

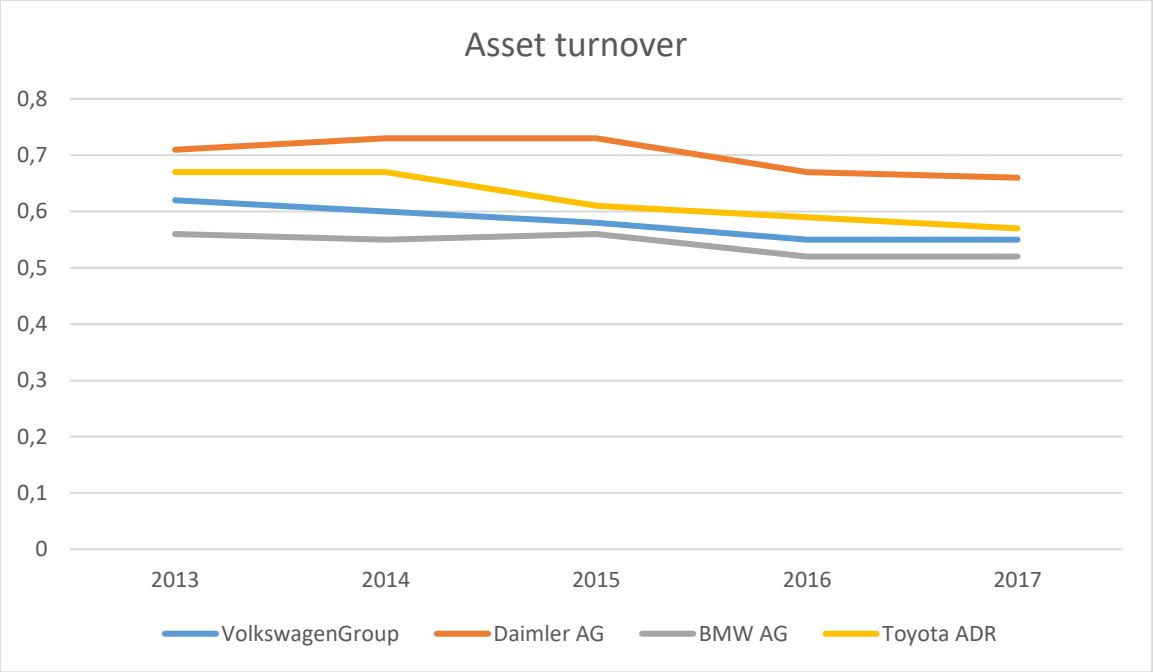


Figure 8. Asset turnover

Data source: Morningstar.com

The equity multiplier of Volkswagen Group is approximately at the same level with Daimler AG at close to 4 in 2017. BMW AG has a bit lower equity multiplier of 3.6 and Toyota motor Corporation significantly lower value of 2.8 in 2017. The main issue in Toyota Motor Corporation's return on equity is its equity multiplier, which means it uses more shareholders equity to finance its asset instead of debt.

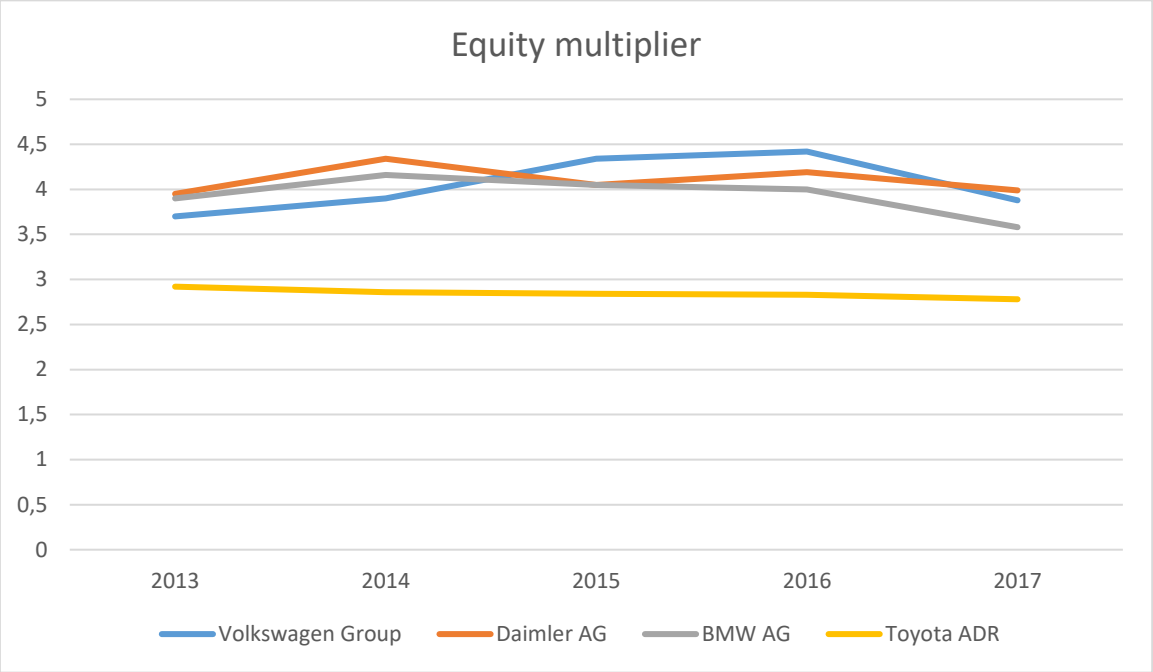


Figure 9. Equity Multiplier

Data source: Morningstar.com

Return on assets= $\frac{Net\ income}{Total\ assets}$

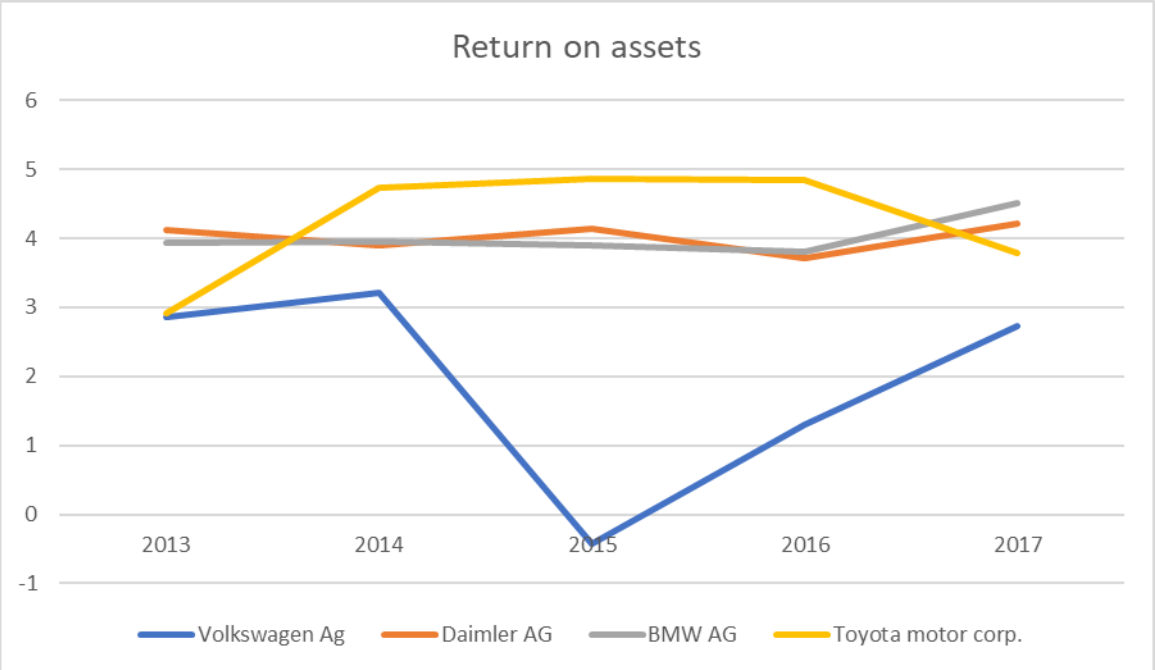


Figure 10. Return on assets

Data source: Morningstar.com

Volkswagen Group's return on assets follows the same trend with return on equity. When breaking return on assets into component analysis the results show that the return on sales is much lower than with its competitors. The Volkswagen's asset turnover is close to its competitors. This means that the return on assets is low mainly because the return on sales is low especially in year 2015 when the net income of Volkswagen Group went into a negative number. Volkswagen has managed to increase its return on sales which has increased the return on assets from a negative number in 2015 to almost three in 2017. Volkswagen is still far behind the levels of its competitors in return on assets but shows signs of spurt with its high sales and strong future sales expectations.

Overall Analysis of profitability ratios: The aftermath of the emission cheating scandal in 2015 affect the profitability ratios tremendously since the financial costs of the emission scandal drop the net income of Volkswagen. Although the negative publicity Volkswagen got from the emission scandal it managed to increase its sales from 202 billion to 213 billion between 2014 and 2015 and to 217 billion between 2015 and 2016. For 2017 the sales increased by 6 percent giving Volkswagen sales of 230 billion. It seems that Volkswagen got away with emission scandal relatively easy and the biggest ramifications of it are in the past. Volkswagen has loyal customers that have been buying Volkswagen vehicles like the emission scandal didn't even happen.

The gross profit margin of Volkswagen group is still lower than BMW AG's and Daimler AG's which indicate that in profitability terms BMW and Daimler can generate more profits after costs of goods sold than Volkswagen. The gross profit margin shows that the emission scandal costs are not the only reason for the profitability efficiency and that BMW and Daimler can use its materials and labour force more efficiently than Volkswagen Group. Volkswagen group's labour force efficiency is low compared to its competitors which increases the costs of goods sold.

As in profitability terms Daimler AG is performing the best according to profitability ratios.

3.3. Liquidity Ratios

$$\text{Current ratio} = \frac{Current\ assets}{Current\ liabilities}$$

Current ratio	**2013**	**2014**	**2015**	**2016**	**2017**
Volkswagen	1.03	1.00	0.98	0.88	1.00
Daimler	1.19	1.15	1.19	1.21	1.23
BMW	1.04	0.96	0.94	0.98	1.04
Toyota motor corp.	1.07	1.07	1.09	1.13	1.03

Table 4. Current ratio

Data source: Morningstar.com

Volkswagen Group's current ratio values are close to one the whole period from 2013-2017 which means that it can cover its current or short-term liabilities. Usually current ratio of 2 is considered as a good current ratio value but this doesn't mean that these entities are in financial struggle. For big automotive entities current ratio close to one is a common and stable current ratio value since all of these entities have strong operating cash flow. For big automotive companies a lower current ratio is more common because the companies have a strong long-term stream of revenue. This allow car companies to have bigger current liabilities and finance them with debt if necessary.

$$\text{Quick ratio} = \frac{Current\ assets - inventory}{Current\ liabilities}$$

Quick ratio	**2013**	**2014**	**2015**	**2016**	**2017**
Volkswagen	0.74	0.72	0.70	0.62	0.70
Daimler	0.83	0.70	0.74	0.76	0.77
BMW	0.66	0.57	0.58	0.63	0.67
Toyota motor corp.	0.84	0.84	0.85	0.86	0.85

Table 5. Quick ratio

Data source: Morningstar.com

Quick ratio doesn't include inventory into current assets. The average quick ratio of Volkswagen is approximately 0.70 and the proggression of quick ratio from 2013-2017 has been stable. This means that Volkswagen group could cover 70% percent of the liabilities rightaway. In automotive industry high inventory levels are part of the industry so quick ratios tend to be under one. Daimler

AG's and BMW AG's quick ratios are close to levels of Volkswagen Group and Toyota ADR is performing slightly better in terms of liquidity based on quick ratio. Volkswagen group's quick ratio of 0.70 is considered tolerable since there are no big volatility between the studied years and the results are close to its competitors.

Overall analysis of the liquidity ratios:

Volkswagen's quick and current ratios are in a satisfactory level. Both of the ratios are near the levels of its competitors which means there are no bigger concerns regarding Volkswagen Group's short-term financial health.

3.4. Solvency ratios

Debt to equity ratio= $\frac{Total\ liabilities}{Shareholder's\ equity}$

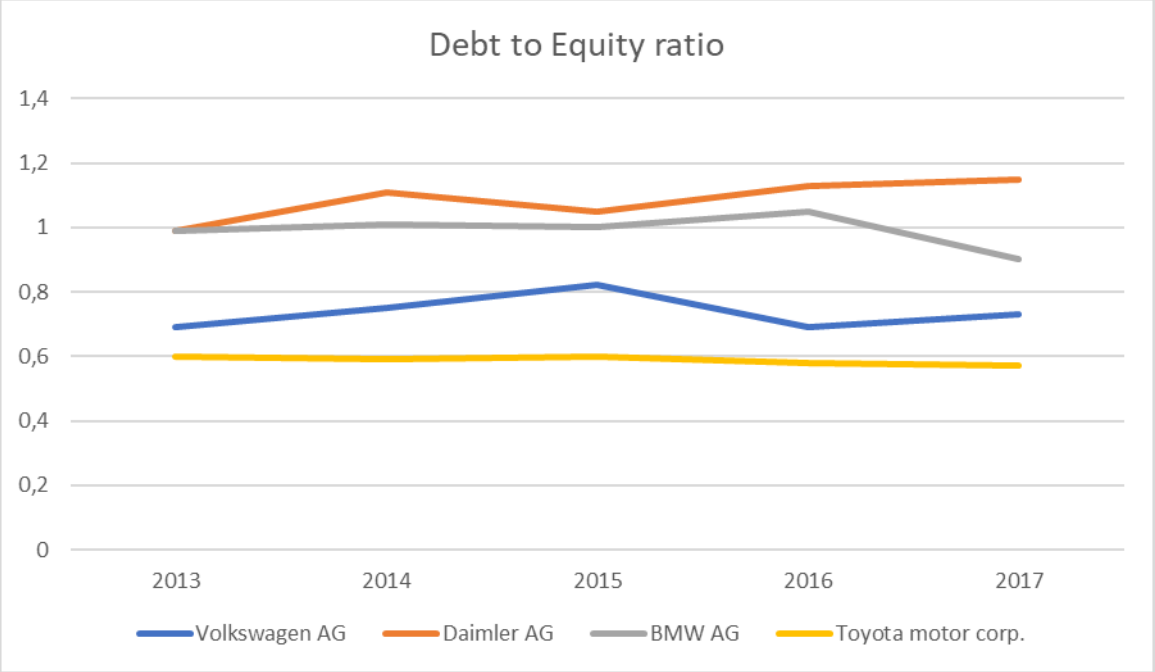


Figure 11. Debt to equity ratio

Data source: Morningstar.com

Volkswagen group's debt to equity ratio is on average 0.74 which is more preferable than Daimler AG's and BMW AG's debt to equity ratio in solvency point of view. Toyota ADR's debt to equity

ratio average is 0.60 which is noticeably lower than the other three companies. Volkswagen Group's rise from 0.75 to 0.82 between 2014-2015 in debt to equity ratio mainly occurred because of the rise of other current liabilities which rise 19 percent and other long-term liabilities which rise 49 percent between 2014-2015. These include the debt Volkswagen Group took in order to pay the costs of emission scandal and to maintain its financial effectiveness. Volkswagen group's solvency ratio is good even though its debt to equity slightly increased from 0.69 to 0.73 between 2016-2017. It is not as profitable to finance assets with equity but it involves a smaller risk in regard of Volkswagen's long-term financial health.

3.5 Operating efficiency ratios

Cash conversion cycle (CCC) = (Days inventory outstanding + Days sales outstanding) – Days payable outstanding

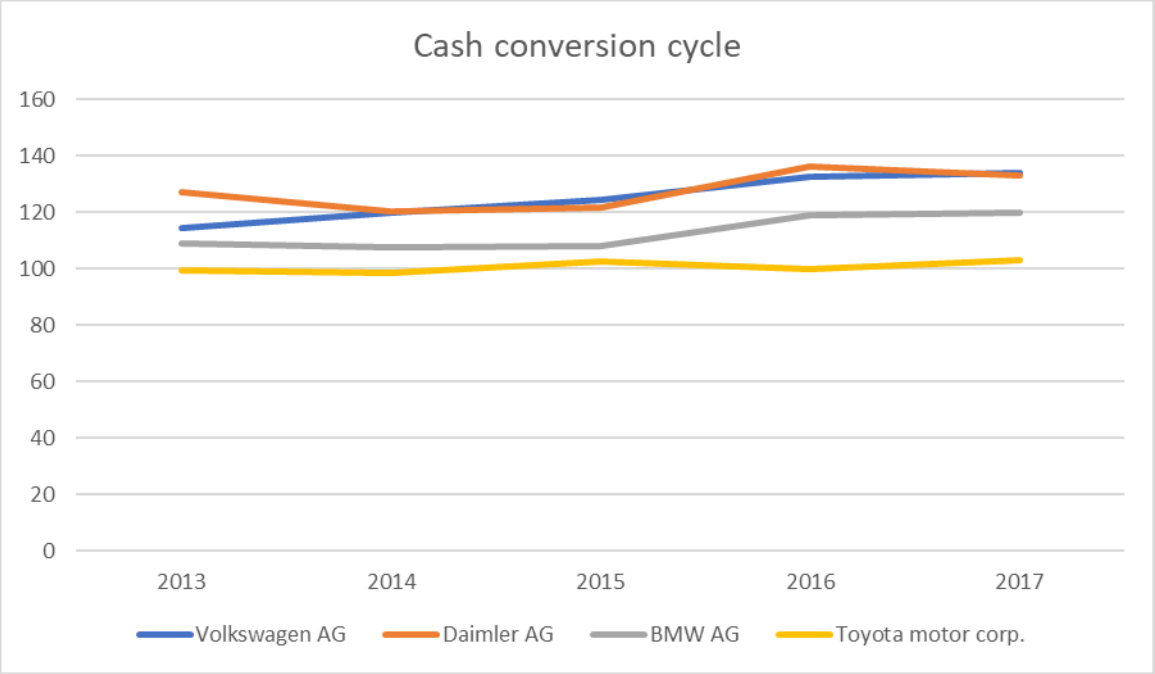


Figure 12. Cash conversion cycle

Data source: Morningstar.com

Volkswagen Group's cash conversion cycle is in the same level with Daimler AG at approximately 135 days in 2017. BMW AG's Cash conversion cycle is at 120 in Toyota Motor Corporation's at

just over 100 days in 2017. The cash conversion cycle indicate that for Volkswagen Group and Daimler AG it takes longer period of time to sell their products and receive the payment or that the companies is paying their bills too quickly. Toyota Motor Corporation has clearly the best cash conversion cycle which indicate that the management can efficiently handle its accounts receivable, inventory and credit sales. In Volkswagen Group's case the cash conversion cycle was driven up because of the increased levels of inventory which indicate that the management is not as efficiently planning their inventory levels as Toyota Motor Corporation and BMW AG.

3.6 Valuation ratios

$$\text{Price earnings ratio} = \frac{Market\ value\ per\ share}{Earnings\ per\ share}$$

$$\text{Price to book ratio} = \frac{Market\ value\ per\ share}{Book\ value\ per\ share}$$

$$\text{Price to sales ratio} = \frac{Stock\ price}{Sales\ per\ share\ (12-month\ period)}$$

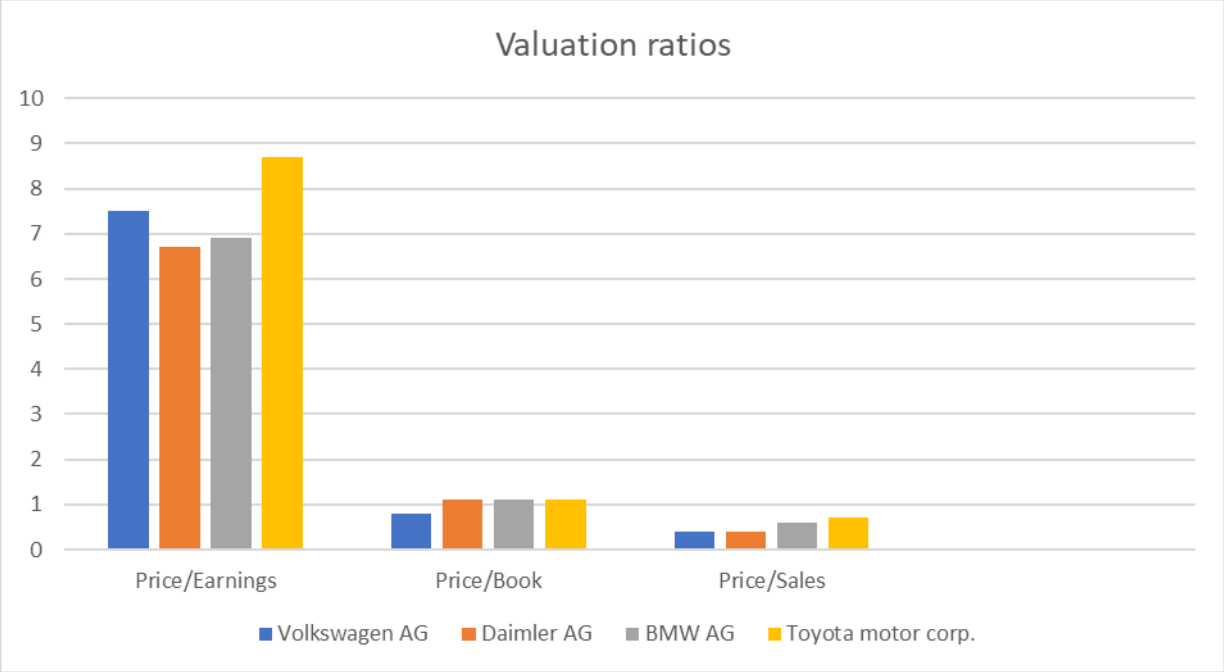


Figure 13. Valuation ratios

Data source: Morningstar.com

Volkswagen Group's price earnings ratio is 7.1 a bit higher than Daimler AG's (6.6) and BMW AG's (6.9) price earnings ratio. According to the price earnings ratio it would be better to invest in either BMW of Daimler, but Volkswagen is not far from its German rivals.

Volkswagen group has the significantly lower price to book value than its competitors. This indicates that Volkswagen group might have an undervalued stock relative to its competitors. The book value of Volkswagen Group is surprisingly low if you take into account the future operations and investments of Volkswagen Group and the increasing sales and profitability ratios that have occurred in the past year. It is uncommon for companies to have a price to book value under one especially if the sales are increasing. Although Volkswagen Group has an attractive price to book value, it can't be analysed alone when trying to get solid results. The price to book value can be also low if the companies assets are exaggerated.

Volkswagen Group has also a low price to sales of 0.4 along with Daimler AG which indicate according to the results that both of the companies have more attractive stock price relative to their revenues than BMW AG and Toyota Motor Corporation.

Overall analysis of valuation ratios:

The calculations of the ratios indicate that out of the four companies Volkswagen is the most undervalued company. The valuation ratios also indicate that Toyota Motor Corporation is overvalued and that Toyota is expecting really good results for its shareholders in the upcoming years. The valuation results of Daimler AG is also attractive from investors' perspective along Volkswagen AG since the earnings are high compared to its stock price within the industry.

Conclusions

The aim of the study is to evaluate Volkswagen Group's financial performance through financial statement analysis. Financial ratios calculated from the financial statements are benchmarked to Daimler AG, BMW AG and Toyota Motor Corporation which are three automotive corporations and big competitors of Volkswagen Group. The studied period for the analysis is 2013-2017.

The Research problem of the thesis is: How profitable and financially stable Volkswagen Group is in the car industry? The problem is analysed through horisontal analysis of income statement and balance sheet and also with financial ratios compared with the examined competitors. From the results the following information can be concluded:

Daimler AG and BMW AG are performing better than Volkswagen AG in terms of profitability according to the profitability ratios calculated. BMW AG has the highest net profit margin of 8,74 which is much higher than Volkswagen Group net profit margin of 4,92 in 2017. Daimler AG had the most efficient gross profit margin, return on equity and return on assets, which means Daimler AG has efficient asset turnover and equity multiplier but it has higher operating expenses than BMW AG.

Volkswagen group is in the aftermath of emission scandal that took place in September of 2015. Because of the emission scandal the net profit margin is significantly lower than with its competitors starting from 2015, because the operating expenses increased. Volkswagen has managed to increase its 2015 negative profit margin significantly mainly by decreasing the operating expenses by 17% and increasing its sales by 8.2 percent between 2015-2017. The net profit margin rose from -0,74 to 4,92 between 2015-2017. Volkswagen Group has still the lowest net profit margin value but shows signs of spurt in the upcoming future. Volkswagen Group has also higher R&D costs than its competitors which drive the operating expenses up.

Volkswagen group's asset turnover and equity multiplier is in mediocre level industrywise which means that the profit margin the biggest area lowering the results in profitability ratios.

Volkswagen gross profit margin is also a bit lower than Daimler AG's and BMW AG's. Looking deeper into the cost of revenue it can be seen that Volkswagen has lower sales/total number of employees than Daimler AG and BMW AG. Volkswagen should cut down its employees and the management should invest in finding areas where there are unnecessary amount of employees.

Volkswagen Group's liquidity ratios are at sufficient level. Its current ratio is stable and as of 2017 it is one, which means that Volkswagen Group's current assets cover its current liabilities. The quick ratio is also at sufficient level of 0,70, which is in high manufacturing industries such as in automotive industry where the inventory levels are high. Volkswagen Group's quick ratio is between BMW AG's (0,67) and Daimler AG's (0,77) quick ratio.

In the thesis Volkswagen Group's solvency is examined through horisontal analysis and debt to equity ratio benchmarked to other companies. Volkswagen has an average of 0,74 debt to equity ratio which is considerably lower than BMW AG's and Daimler AG's debt to equity ratio. This ratio indicate that Volkswagen Group has a smaller insolvency risk in the future, but it might not produce earnings as efficiently because the assets are financed more through outside financing. The Volkswagen's balance sheet also indicate that Volkswagen has strong financial fundementals has no risk of insolvency at the moment even though the emission scandal rose the amount of liabilities.

The operating efficiency of the examined entities is evaluated through cash conversion cycle. Volkswagen Group has the longest cash conversion cycle which indicates that it takes longer period of time for Volkswagen Group and Daimler to sell the products and receive the payments. Volkswagen Group's management should improve the efficiency of inventory levels to get the cash conversion cycle into more competitive cash conversion cycle.

The valuation of Volkswagen Group is evaluated through price/earnings ratio, price/book ratio and price/sales ratio. All in all the ratios indicate that Volkswagen Group stock is the most undervalued of the four entities. Volkswagen group has the highest market value compared to book value and it has the lowest stock price compared to its revenues. According to price earnings ratio Daimler AG is also an attractive entity to look at since it has high earnings compared to its stock price within the industry.

Volkswagen Group is investing relatively more to its future operations compared to its

competitors examined in the thesis. Volkswagen is going to invest 34 billion euros in future operations including new models in hybrid vehicles, full electric vehicles, self-driving vehicles and digitalisation which can be seen in its high research and development costs that are planned to be high also in the following years.

All in all the results show that Volkswagen Group that the liquidity and solvency ratios are at sufficient level. The profitability hasn't increased yet to the levels of BMW AG and Daimler AG but shows positive signs of increase in the future. The operating efficiency is considered long and should be cut through management decisions. The cash conversion cycle is unefficient compared to BMW and Toyota, especially because of the long inventory turnover. Management should manage the inventory levels more carefully in order to reduce the time of cash conversion cycle. The valuation results indicate that Volkswagen Group is undervalued with its current performance and market value.

Further studies of the given topic could analyse deeper the cashflow statement of Volkswagen Group, where there were also big changes due to the emission scandal. Further studies could also include a benchmarking brand from the United States, such as General Motors. The future of Volkswagen group will be interesting to follow since there are a lot of new technologies coming into the automotive industry. Further studies in the future could focus on how well Volkswagen Group managed to perform its future operations and does the profitablity of Volkswagen Group continue to grow after the aftermath of the emission scandal. Further studies could also focus on only to electric cars which will be much larger area of car industry in the near future.

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https://ac.els-cdn.com/S0929119916303650/1-s2.0-S0929119916303650-main.pdf?_tid=c44fae8d-a7b6-4239-953d-6f97a43e3dc4&acdnat=1524786068_5df643b58e7652163c98d0124326bb9c

APPENDICES

Appendix 1. Financial ratios categories

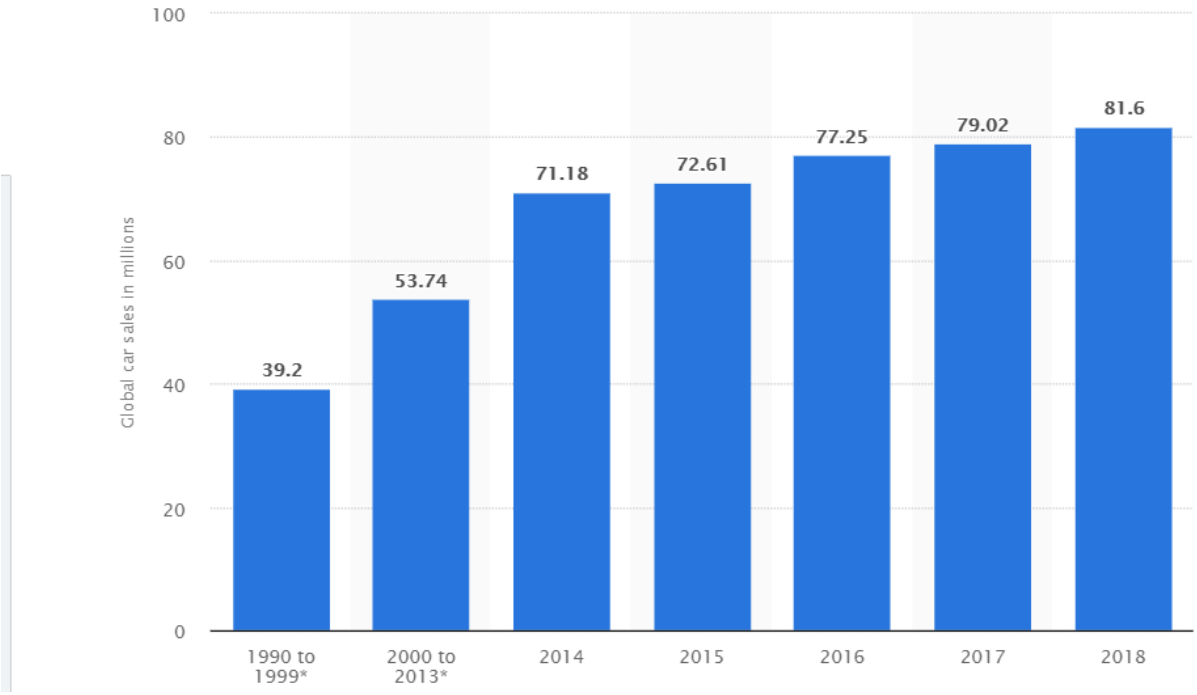
Table 1. Financial ratios categories

Profitability ratios	Ratios evaluating the company's ability to get earnings from their operations. Examples of profitability ratios: Net Profit margin Gross profit margin ratio Return on equity Return on assets Return on capital employed
Liquidity ratios	Ratios evaluating company's ability to pay off its short-term debt. Examples of liquidity ratios: Quick ratio Current ratio
Solvency ratios	Ratios evaluating company's long-term ability to pay its debts and the interest the debt has. Examples of solvency ratios: Debt to assets ratio Debt to equity ratio
Operating efficiency ratios	Ratios evaluating how well company can use its assets compared to liabilities and generate

	profit. Examples of operating efficiency ratios: Cash conversion cycle Inventory turnover days' sales in inventory
Valuation ratios	Ratios evaluating stocks current and future market value. Examples of market Valuation ratios: Price to earnings ratio Price to book ratio Price to sales ratio Dividend yield

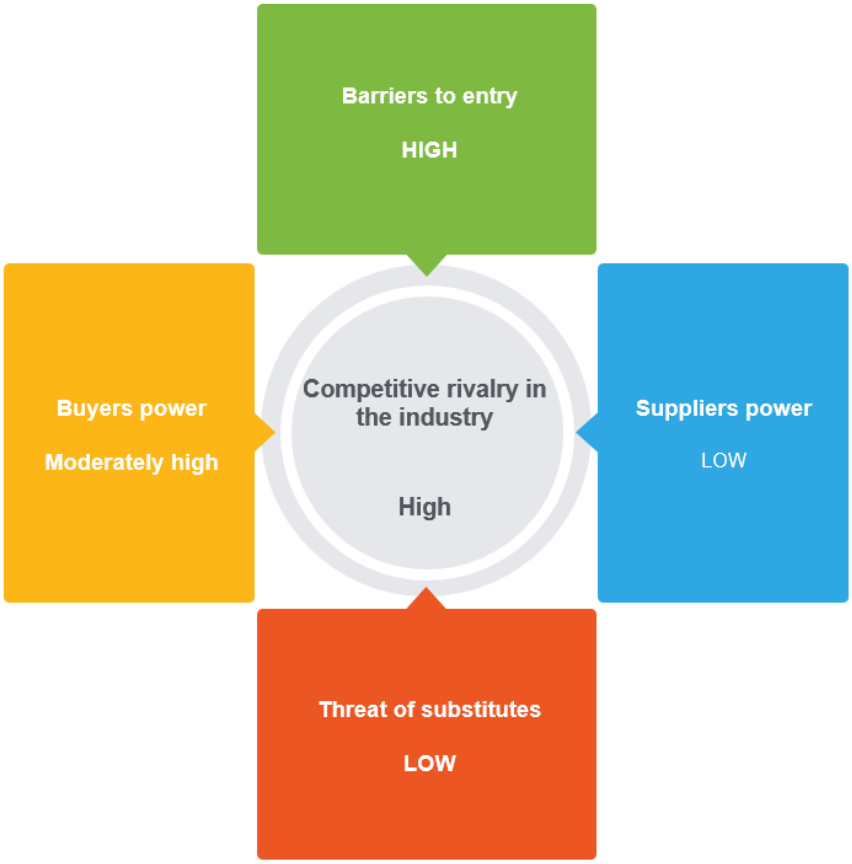
Source: Table made by the author

Appendix 2. Global car sales in millions



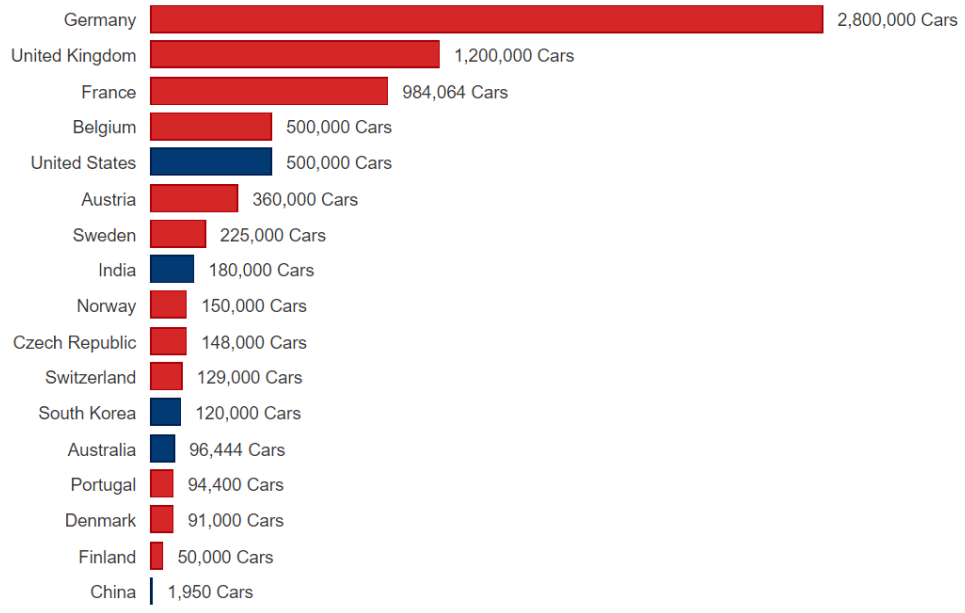
Source: statista.com

Appendix 3. Porter's five forces: Automotive industry



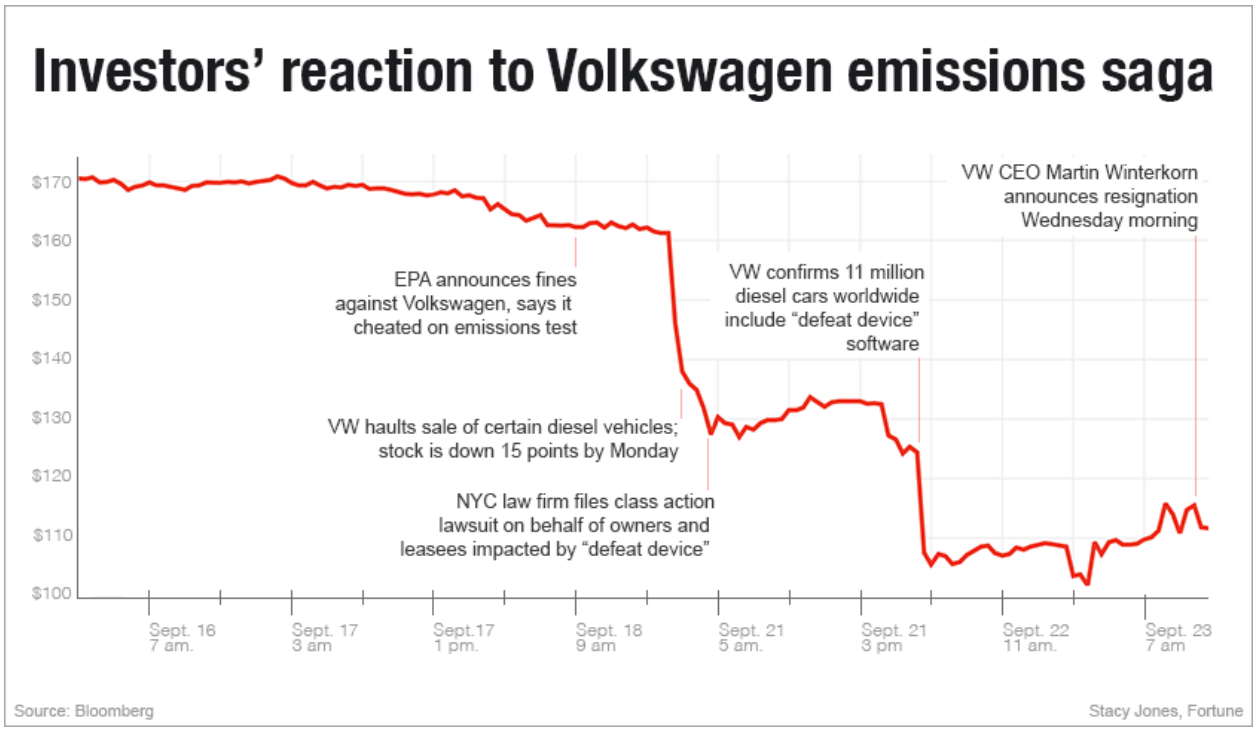
Source: Porter (1979), author's evaluations

Appendix 4. Amount of cars using illegal emission test bypassing software



Canada and South Africa have also been affected by the diesel scandal, but exact figures are not yet known.

Appendix 5. Short-term effect of emission scandal to stock price



Appendix 6. Volkswagen horizontal analysis: Income statement

VOLKSWAGEN AG INCOME STATEMENT									
Fiscal year ends in December. EUR in millions	2013-12	Inc/dec %	2014-12	Inc/dec %	2015-12	Inc/dec %	2016-12	Inc/dec%	2017-12
Revenue	197008	3 %	202458	5 %	213292	2 %	217268	6 %	230682
Cost of revenue	161407	3 %	165934	8 %	179382	-2 %	176270	7 %	188140
Gross profit	35601	3 %	36524	-7 %	33910	21 %	40998	4 %	42542
Operating expenses									
Sales, General & Administrative	26543	2 %	27133	13 %	30712	-2 %	30036	3 %	30964
Other operating expenses	-2441	12 %	-2739	Inc	4436	-41 %	2633	-171 %	-1865
Total operating expenses	24102	1 %	24394	44 %	35148	-7 %	32669	-11 %	29099
Operating income	11499	5 %	12130	Dec	-1238	Inc	8329	61 %	13443
Interest Expense	2366	12 %	2658	-10 %	2394	2 %	2437	-5 %	2317
Other income (expense)	3295	62 %	5322	-56 %	2331	-40 %	1400	99 %	2787
Income before taxes	12428	19 %	14794	Dec	-1301	Inc	7292	91 %	13913
Provision for income taxes	3283	13 %	3726	-98 %	59	3141 %	1912	19 %	2275
Other income					-1	0 %	-1		
Net income from continuing operations	9145	21 %	11068	Dec	-1361	Inc	5379	116 %	11638
Extraordinary items	-27	411 %	-138	54 %	-212	6 %	-225	22 %	-274
Other	-106	239 %	-359	21 %	-433	6 %	-460	21 %	-558
Net income	9066	20 %	10847	Dec	-1582	Inc	5144	121 %	11354
Net income available to common shareholde	9066	20 %	10847	Dec	-1582	Inc	5144	121 %	11354
Earnings per share									
Basic	18,63	17 %	21,84	Dec	-3,2	Inc	10,24	121 %	22,63
Diluted	18,63	17 %	21,84	Dec	-3,2	Inc	10,24	121 %	22,63
Weighted average shares outstanding									
Basic	486	2 %	496	1 %	501	0 %	501	0 %	501
Diluted	486	2 %	496	1 %	501	0 %	501	0 %	501
EBITDA	29444	16 %	34243	-39 %	20749	47 %	30522	25 %	38260

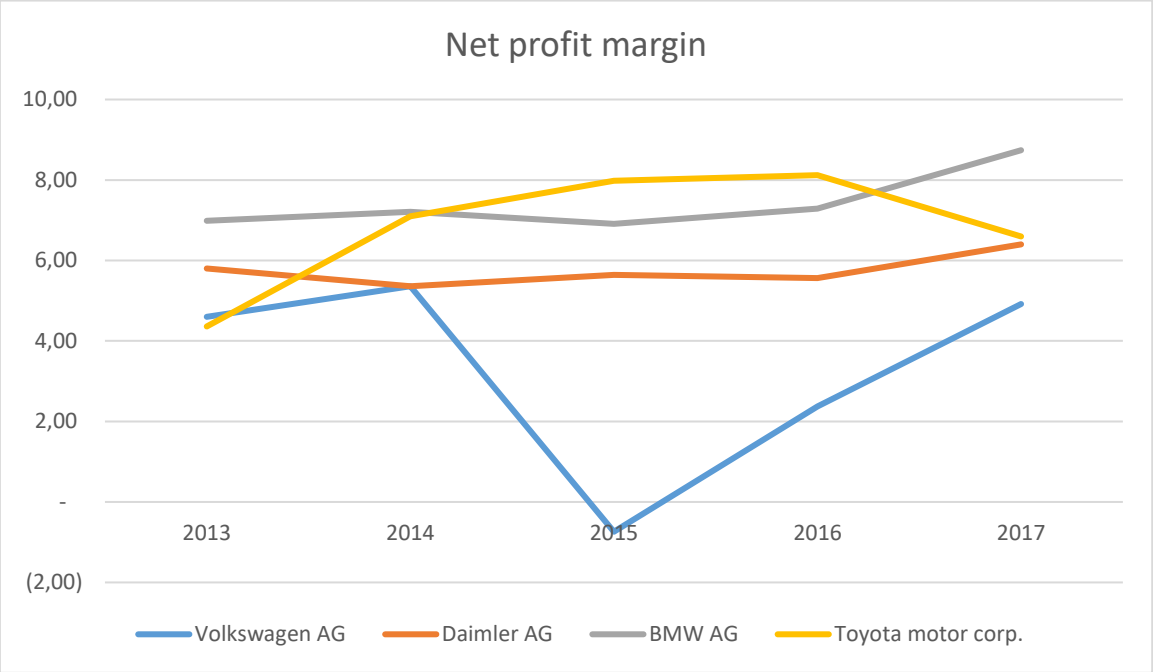
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 7. Volkswagen horizontal analysis: Balance Sheet

VOLKSWAGEN AG BALANCE SHEET									
EUR in millions except per share data.	2013-12		2014-12		2015-12		2016-12		2017-12
Assets									
Current assets									
Cash									
Cash and cash equivalents	23178	-17 %	19124	9 %	20872	-8 %	19264	-4 %	18457
Short-term investments	10674	26 %	13469	39 %	18684	16 %	21695	-9 %	19725
Total cash	33852	-4 %	32593	21 %	39556	4 %	40959	-7 %	38182
Receivables	49519	13 %	55869	4 %	58021	7 %	61860	8 %	66503
Inventories	28653	10 %	31466	11 %	35048	11 %	38978	4 %	40415
Other current assets	10168	10 %	11174	14 %	12762	9 %	13925	8 %	15012
Total current assets	122192	7 %	131102	11 %	145387	7 %	155722	3 %	160112
Non-current assets									
Property, plant and equipment									
Gross property, plant and equipment	146769	12 %	163671	11 %	181950	10 %	199973	4 %	207796
Accumulated Depreciation	-82122	9 %	-89916	10 %	-98606	9 %	-107500	5 %	-113300
Net property, plant and equipment	64647	14 %	73755	13 %	83344	11 %	92473	2 %	94496
Goodwill	23730	-1 %	23577	0 %	23646	0 %	23559	0 %	23443
Intangible assets	35513	2 %	36358	3 %	37501	4 %	39040	2 %	39976
Deferred income taxes	5622	5 %	5878	37 %	8026	22 %	9756	1 %	9810
Other long-term assets	72629	11 %	80538	4 %	84031	6 %	89182	6 %	94356
Total non-current assets	202141	9 %	220106	7 %	236548	7 %	254010	3 %	262081
Total assets	324333	8 %	351208	9 %	381935	7 %	409732	3 %	422193
Liabilities and stockholders' equity									
Liabilities									
Current liabilities									
Short-term debt	37627	9 %	41177	14 %	46915	22 %	57388	-9 %	52502
Capital leases	50	-32 %	34	18 %	40	33 %	53	-4 %	51
Accounts payable	18023	8 %	19530	5 %	20461	11 %	22794	1 %	23046
Deferred income taxes	2869	-3 %	2791	-53 %	1301	0 %	1301	7 %	1397
Taxes payable	2068	11 %	2300	0 %	2303	35 %	3111	-12 %	2731
Other current liabilities	57988	12 %	64874	19 %	77469	20 %	92868	-13 %	80662
Total current liabilities	118625	10 %	130706	14 %	148489	20 %	177515	-10 %	160389
Non-current liabilities									
Long-term debt	60139	12 %	67074	7 %	71719	-12 %	63113	25 %	79085
Capital leases	363	0 %	362	19 %	431	13 %	486	-12 %	428
Deferred taxes liabilities	11568	-31 %	7989	5 %	8373	-1 %	8301	4 %	8666
Accrued liabilities	559	-6 %	527	26 %	663	13 %	750	13 %	844
Deferred revenues	702	-79 %	146	3 %	150	281 %	572	21 %	694
Pensions and other benefits	21796	37 %	29829	-8 %	27564	20 %	33047	-1 %	32768
Minority interest	2304	-91 %	198	6 %	210	5 %	221	4 %	229
Other long-term liabilities	18240	33 %	24189	49 %	36066	-9 %	32817	-9 %	30013
Total non-current liabilities	115671	13 %	130314	11 %	145176	-4 %	139307	10 %	152727
Total liabilities	234296	11 %	261020	13 %	293665	8 %	316822	-1 %	313116
Stockholders' equity									
Additional paid-in capital	1191	2 %	1218	5 %	1283	0 %	1283	0 %	1283
Retained earnings	72341	-2 %	71197	-3 %	69039	2 %	70446	16 %	81367
Accumulated other comprehensive inc	14201	24 %	17576	1 %	17738	18 %	20960	25 %	26199
Total stockholders' equity	87733	3 %	89991	-2 %	88060	5 %	92689	17 %	108849
Total liabilities and stockholders' equity	322029	9 %	351011	9 %	381725	7 %	409511	3 %	421965

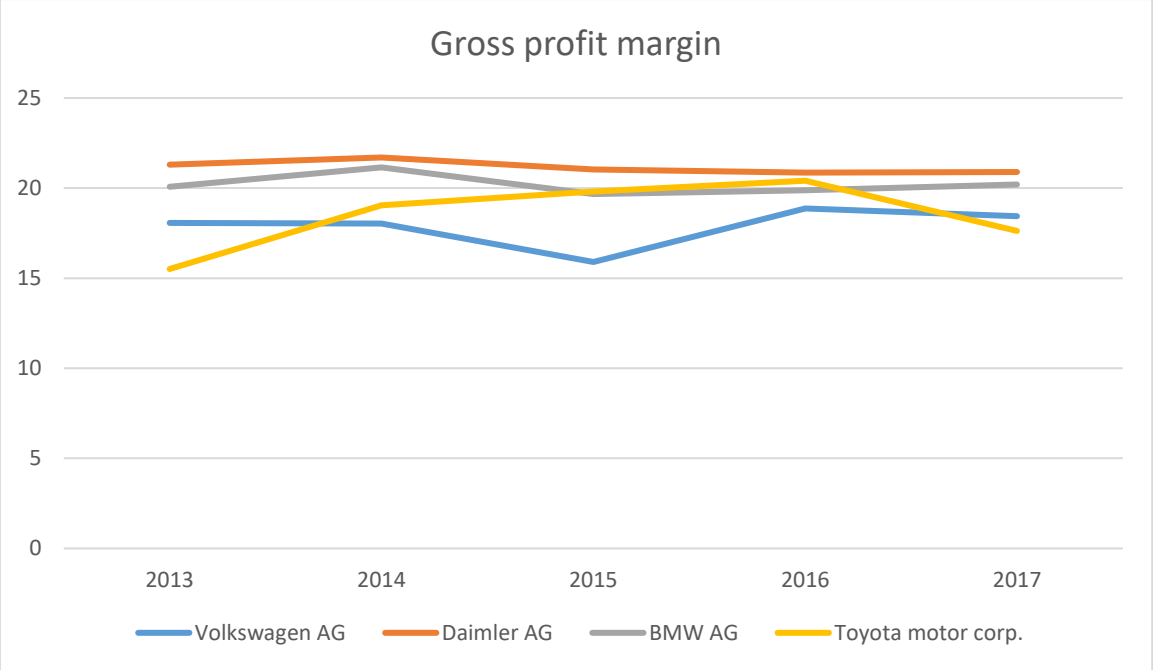
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 8. Net profit margin



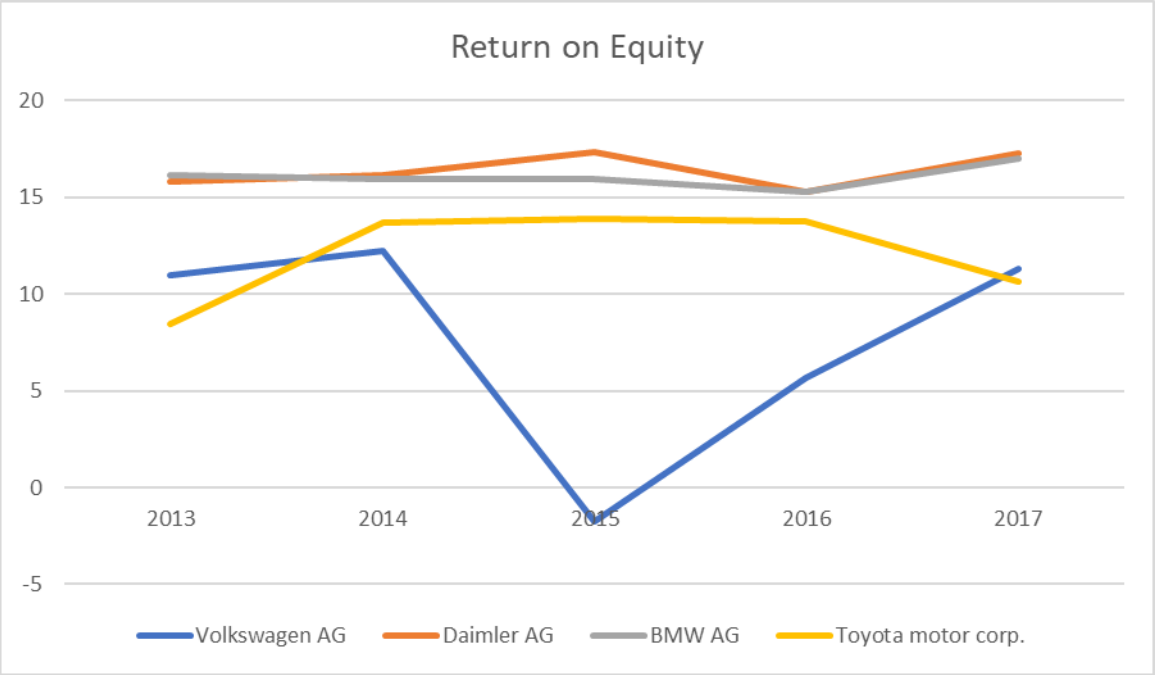
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 9. Gross profit margin



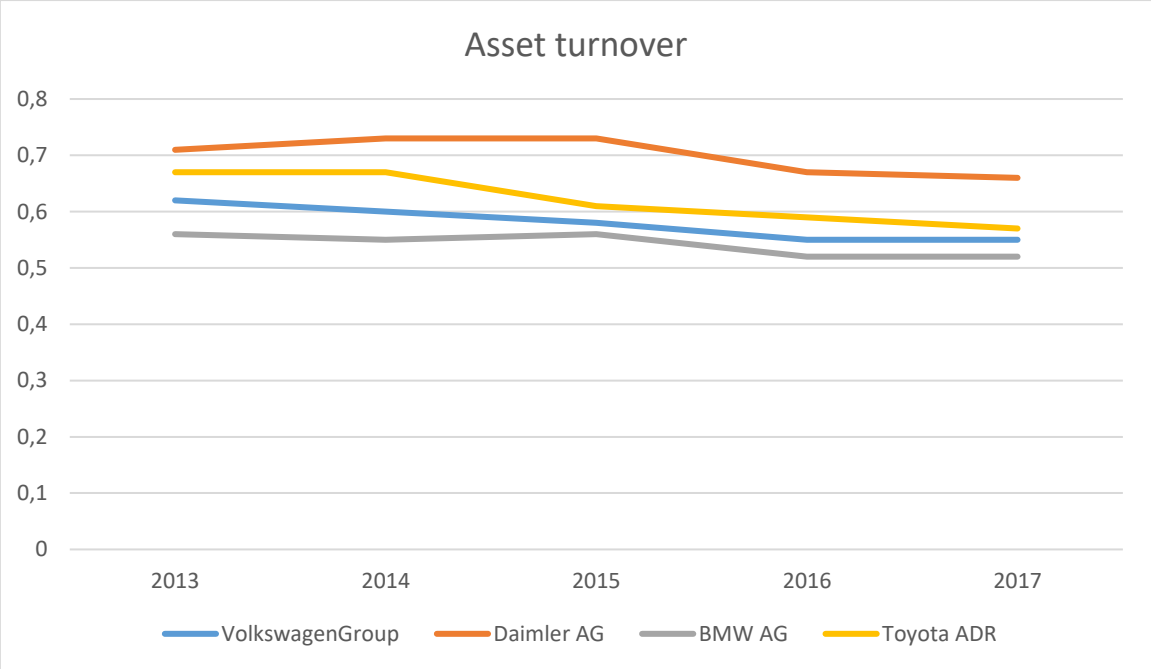
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 10. Return on equity

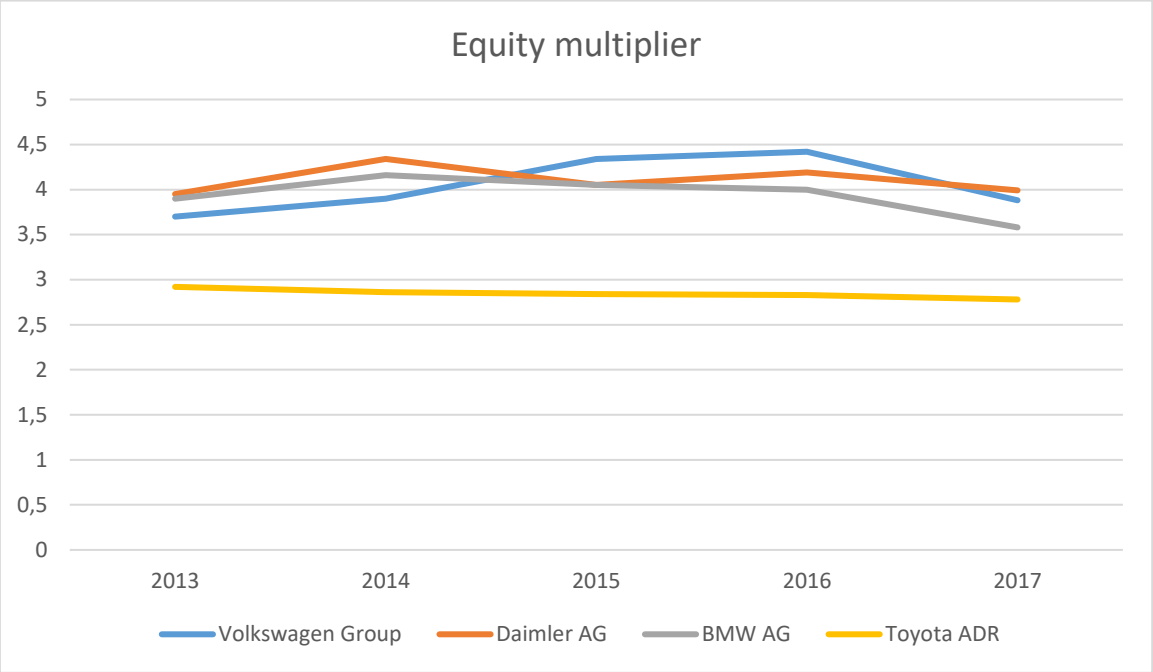


Source: Morningstar Volkswagen Group AG, author's calculations

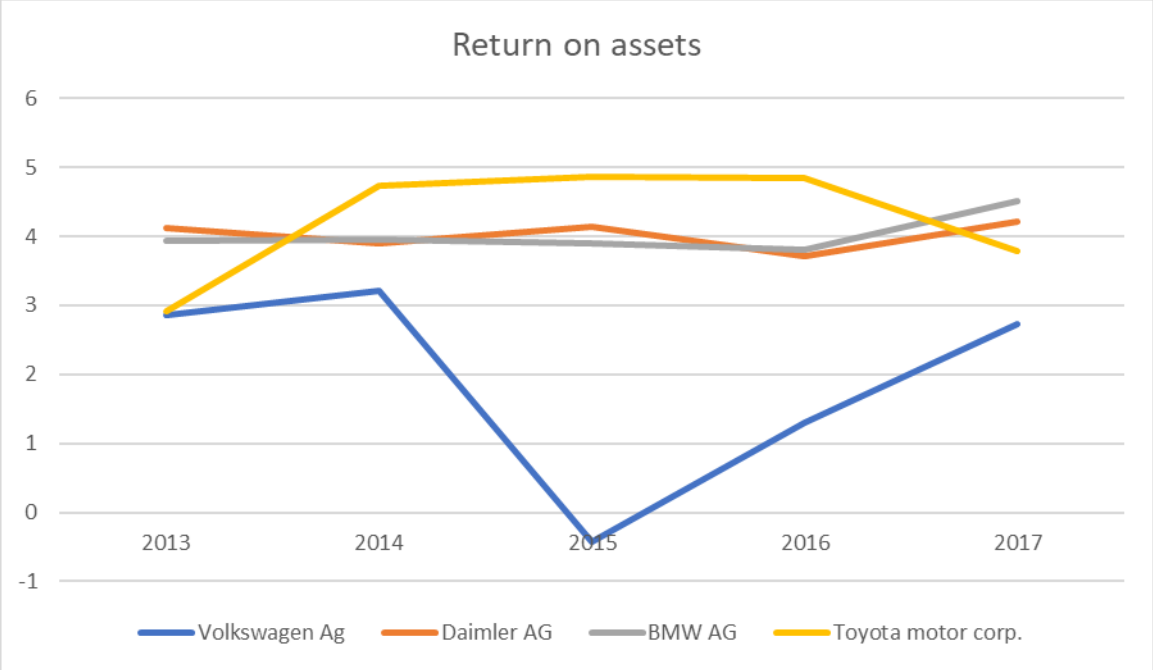
Appendix 11. Asset turnover



Appendix 12. Equity multiplier



Appendix 13. Return on assets



Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 14. Current ratio

Current ratio	**2013**	**2014**	**2015**	**2016**	**2017**
Volkswagen	1.03	1.00	0.98	0.88	1.00
Daimler	1.19	1.15	1.19	1.21	1.23
BMW	1.04	0.96	0.94	0.98	1.04
Toyota motor corp.	1.07	1.07	1.09	1.13	1.03

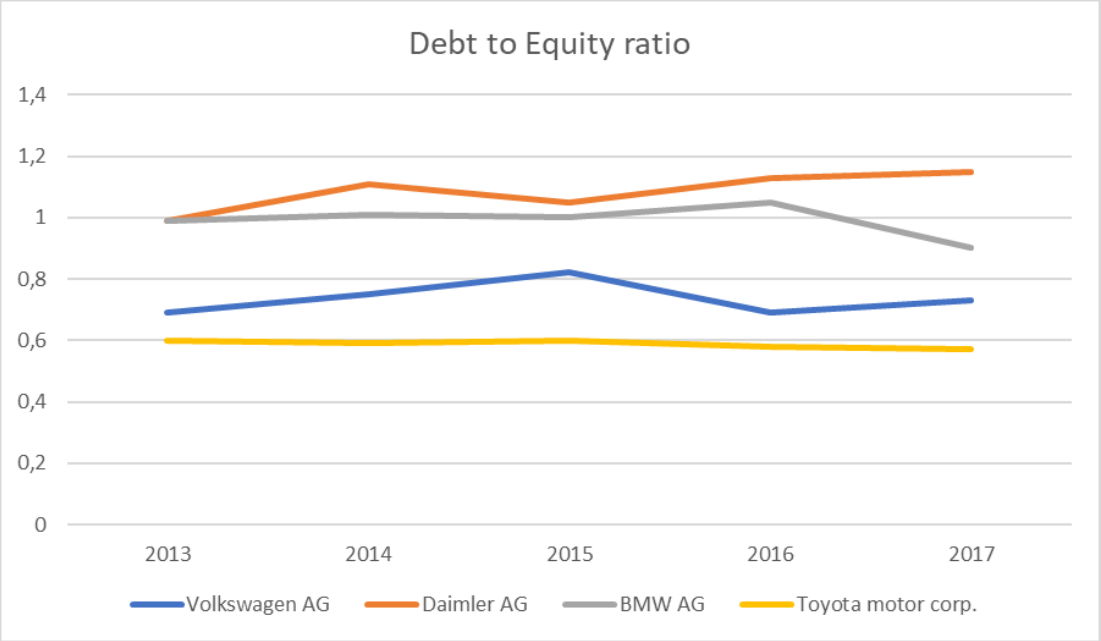
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 15. Quick ratio

Quick ratio	**2013**	**2014**	**2015**	**2016**	**2017**
Volkswagen	0.74	0.72	0.70	0.62	0.70
Daimler	0.83	0.70	0.74	0.76	0.77
BMW	0.66	0.57	0.58	0.63	0.67
Toyota motor corp.	0.84	0.84	0.85	0.86	0.85

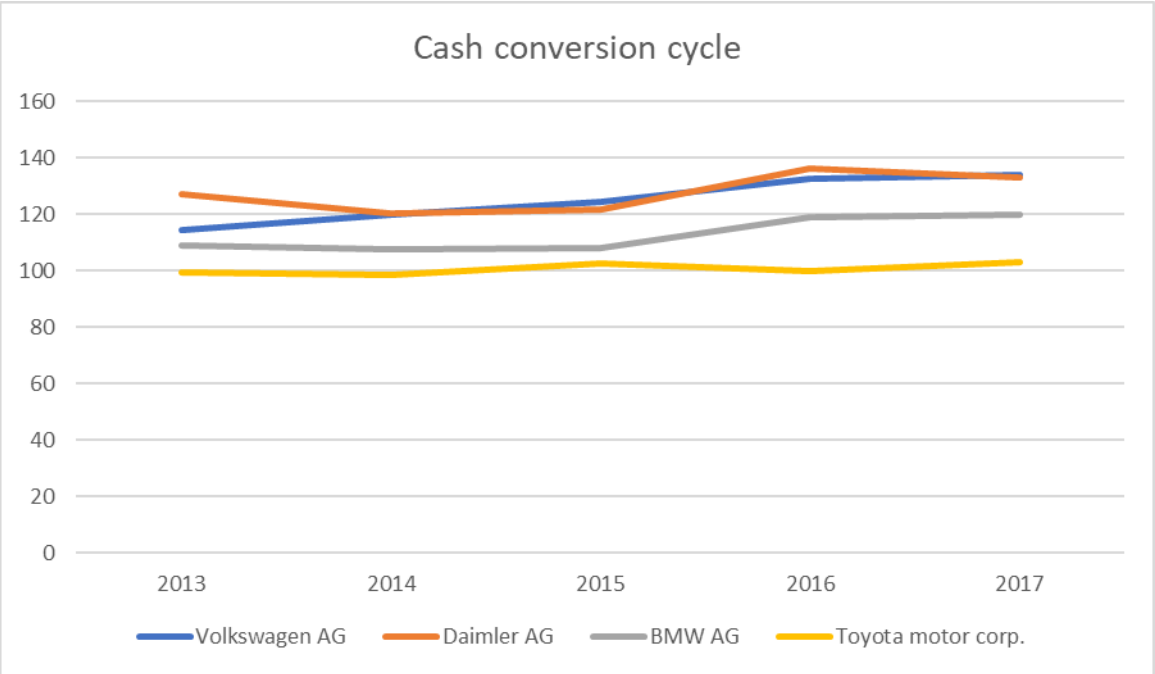
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 16. Debt to equity



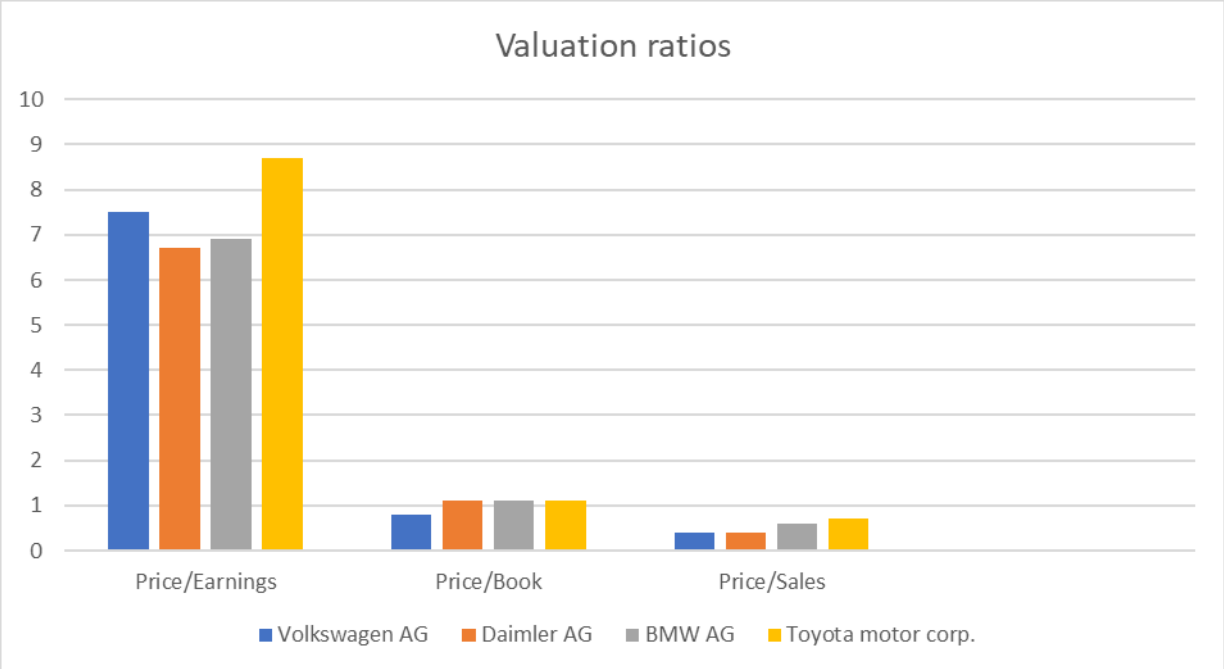
Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 17. Cash conversion cycle



Source: Morningstar Volkswagen Group AG, author's calculations

Appendix 18. Valuation ratios



Source: Morningstar Volkswagen Group AG, author's calculations