

# Analyzing Volkswagen's Value Based on Multiples Valuation Method

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**Abstract.** This paper evaluated the value of Volkswagen Company based on multiples valuation method. The study used P/E and EV/EBITDA ratios as multiples to analyse Volkswagen's stock price and enterprise value. Guided by valuation theory, the author chose several comparable peer firms to Volkswagen, calculated the average multiples, and applied them to Volkswagen's corresponding multipliers. Based on the study result, the author concludes that Volkswagen is undervalued when applying P/E and EV/EBITDA ratios. Although the inherent flaws of the multiples valuation method may make the conclusion of this paper imprecise, this paper aims to provide a reference case for subsequent multiples valuation research. The author believes further research and development of the multiples valuation method will increase the accuracy of this method in evaluating a company's value.

**Keywords:** Multiples valuation; P/E ratio; Volkswagen.

## 1. Introduction

### 1.1 Research Background

Company valuation is of great importance in finance research. In practice, investors often use discounted cash flow valuation (DCF) to study the value of a company. However, this method is cumbersome to apply and sensitive to many assumptions [1]. Therefore, the multiples valuation method in company valuation has attracted more attention. Multiples valuation is a theory that implies "similar assets sell at similar prices". It analyses whether a research company is reasonably valued by comparing specific ratios of comparable peer companies. Compared with the DCF method, its process is more straightforward and efficient. The purpose of this paper is to provide a reference case for subsequent research on multiple valuations. Volkswagen Group (Volkswagen AG) is the research object of this paper. It is a German automobile manufacturer founded by the German government in 1937. It mainly produces cars at affordable prices, and its products are rich in diversity. The group currently owns ten auto brands with sales worldwide and is one of the top 10 well-known automobile manufacturers in the world today. The author will select the comparable peer companies of Volkswagen Group and analyses its stock price and enterprise value by comparing two types of multiples. The result shows that Volkswagen Group is undervalued by applying the multiples valuation.

This article further motivates and applies the multiples valuation theory in the next section in practice. In section 3, this paper will discuss the result of the study, and section 4 concludes with the results and this paper's opinion.

### 1.2 Research Contents

This paper uses multiples valuation method to analyze Volkswagen's share price reasonably. A multiple refers to the ratio of a company's market price variable to a particular value driver. This method applies the average ratio of similar comparable firms within the same industry to predict the appraised company's stock price and compares the predicted price with the actual price to analyze whether the actual stock price of the company is fair. That is, this paper will estimate Volkswagen's stock value by looking at some data from peer companies. At the current stage, P/E and EV/EBITDA ratios are the most commonly used multiples to value a company's share price. Therefore, this paper

will take the average P/E and EV/EBITDA ratios of Volkswagen's comparable peer companies to estimate Volkswagen's stock value.

## 2. Methodology

### 2.1 Choice of Company

The first step is to pick the appropriate comparable peer firms for Volkswagen. Comparable peer group members are typically selected from companies within the same industry with similar risk and earnings growth [2]. Volkswagen's 2021 annual report (<https://annualreport2021.volkswagenag.com/>) shows that Volkswagen competes in the global automobile industry, producing various models of cars. Volkswagen is a world-renowned manufacturer of cars, and its product positioning is relatively mid-range. Therefore, Volkswagen's comparable peer companies should also belong to the mid-range automotive manufacturing industry. Under the premise of the same industry, it is more appropriate to choose a company with a similar beta coefficient and earnings growth as Volkswagen. Beta refers to the sensitivity of a company to systematic risk, which helps researchers isolate firm-specific effects from market-wide effects [3]. Selecting similar beta coefficients can evaluate companies that are more similarly affected when they encounter market risks. Earnings growth reflects the company's future growth potential and provides a good comparison in selecting comparable peer firms.

### 2.2 Data collection

The second step is collecting comparable companies' P/E and EV/EBITDA ratios. As the multiples used in this paper, these two ratios are critical in estimating Volkswagen's share price. P/E ratio refers to market share price divided by earnings per share. This ratio is an essential determinant of stock valuation. Investors use the P/E ratio to evaluate companies' share prices by comparing it to competitors' ratios. Researchers have often used the PE ratio in past studies to investigate its relationship with stock returns [4]. EV/EBITDA ratio has become the second most used valuation measure after the P/E ratio. EV/EBITDA ratio refers to a company's enterprise value compared to its earnings before interest, tax, depreciation and amortization. Compared to the P/E ratio, it looks more closely at gross profit levels and provides an unbiased view of a company's profitability while normalizing the impact of its capital structure and accounting policies [5]. Moreover, EBITDA generally yields better estimates than the EBIT multiple. Therefore, to make the multiples valuation method more accurate, this paper will take two multiples to estimate the stock value of Volkswagen.

### 2.3 Predicted Value Calculation

The third step is calculating the average P/E and EV/EBITDA ratios of the selected comparable peer companies and applying these ratios to Volkswagen's EPS and EBITDA, respectively, to arrive at a forecasted Volkswagen stock and enterprise value based on the multiples valuation method. Through this step, the multiples valuation method will produce the predicted value for Volkswagen that this paper wants. The estimated figure produced needs to be compared with actual Volkswagen data to play a role.

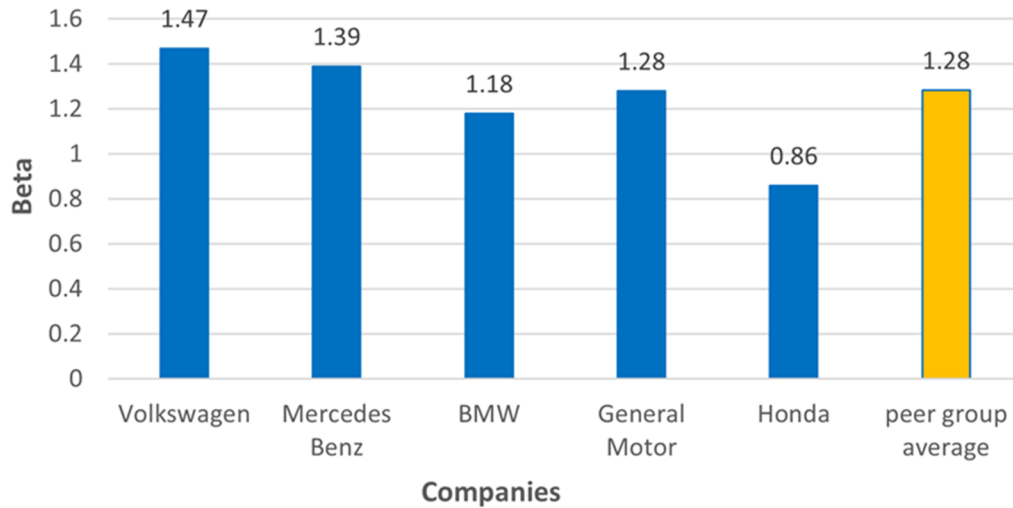
### 2.4 Comparison

The final step is comparing the predicted value with the actual data corresponding to Volkswagen to analyze whether the current value of Volkswagen is overvalued or undervalued, or relatively fair. The analysis of this paper is based on the results produced by this step.

### 2.5 Theory Application

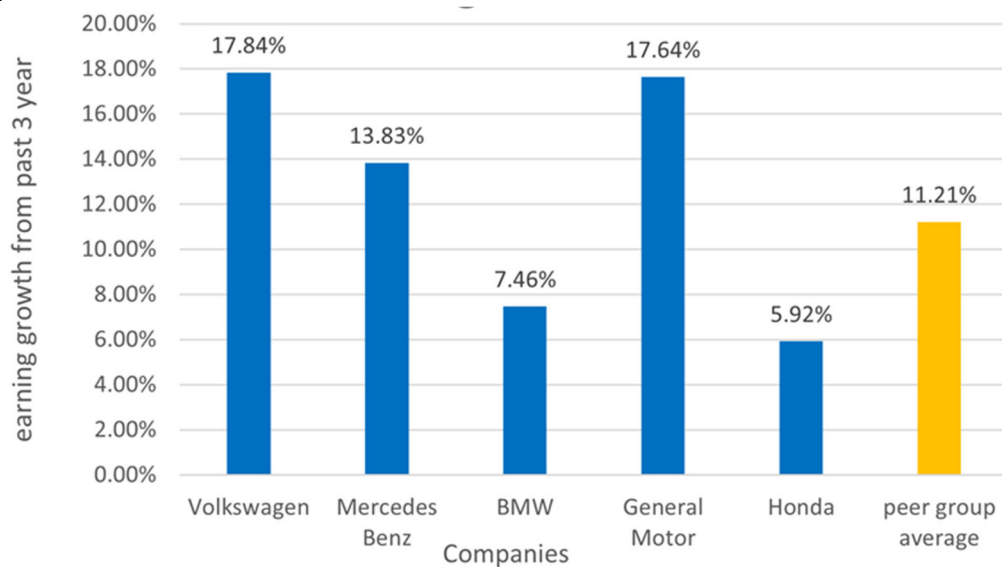
After extensive research, the comparable companies to Volkswagen selected for this paper are Mercedes Benz, BMW, General Motors, and Honda. The appropriate comparable peer companies

can increase the accuracy and credibility of multiple valuation models [6]. According to these companies' 2021 annual report (<https://annualreport2021.volkswagenag.com/>), they all belong to the automobile industry with similar product positioning to Volkswagen [7]. According to data provided by Yahoo Finance (<https://finance.yahoo.com/>), Volkswagen's beta coefficient is 1.47, while the average beta coefficient of the chosen peer group is 1.28, as shown in Figure 1 [8]. It indicates that peer companies have similar sensitivities to market risk as Volkswagen.



**Fig. 1** Average beta value of peer group

Furthermore, based on data from the Companies MarketCap website (<https://companiesmarketcap.com/>), Volkswagen's average earning growth rate from the past three years is 17.84%, while the peer group's corresponding data is 11.21%, as shown in Figure 2 [9]. These similar data make the companies selected for this paper more suitable as comparable peers to Volkswagen.



**Fig. 2** Volkswagen's average earning growth rate

In order to reduce the impact of continuous changes in the P/E ratio, this paper uses the P/E ratio at the end of the past three years and calculates the average and median values to evaluate the stock price of Volkswagen. Finbox website (<https://finbox.com/>) provides that Volkswagen's P/E ratio from the past three years is respectively 6.3, 20.1, and 6.5 [10]. The P/E ratio of Mercedes Benz, BMW, General Motors and Honda in 2021 are respectively 6.3, 4.9, 7.8, and 7.5; in 2020 are respectively 187.4, 13.4, 18.5, and 13.8; in 2019, are respectively 13.1, 9.8, 5.9, and 9. The average P/E ratio for the comparable peer group in 2021, 2020 and 2019 is 6.63, 58.28, and 9.45, respectively. These average figures are slightly more prominent than Volkswagen's actual P/E ratios. After calculating

the average P/E ratio for the peer group, it will be applied to Volkswagen's actual earnings per share to arrive at the estimated Volkswagen stock price required for this paper. According to data from Yahoo Finance on September 1, 2022, Volkswagen's diluted Earnings per share at the end of 2021, 2020, and 2019 are, respectively, 28.17, 7.58, and 27.11 euros [8]. Volkswagen's estimated share price can thus be calculated to be 186.64 euros per share in 2021, 441.90 euros in 2020, and 256.23 euros in 2019. Volkswagen's actual share prices at the end of the past three years are all lower than this estimate. In addition, most of the predicted stock prices are also more significant than the actual value when substituting in the median value, as shown in Table 1. Therefore, the multiples valuation method applied when using the P/E ratio as a multiple concludes that Volkswagen's share price has been continuously undervalued over the past three years.

**Table 1.** Peer group metrics comparison

	PE ratio (2021)	PE ratio (2020)	PE ratio (2019)	PE ratio (three year average)
Volkswagen	6.3	20.1	6.5	10.97
Mercedes Benz	6.3	187.4	13.1	68.93
BMW	4.9	13.4	9.8	9.37
General Motors	7.8	18.5	5.9	10.73
Honda	7.5	13.8	9	10.10
Average P/E ratio of peer group	6.63	58.28	9.45	24.78
Median P/E ratio of peer group	6.90	16.15	9.40	10.42
	EPS (2021)	EPS (2020)	EPS (2019)	EPS (three year average)
Volkswagen	28.17	7.58	27.11	20.96
	2021	2020	2019	three year average
Price per share (using average)	186.64	441.90	256.23	294.92
Price per share (using median)	194.38	122.47	254.87	190.57
Actual price per share	177.48	152.42	176.24	168.71

After valuing Volkswagen's share price using the P/E ratio, the EV/EBITDA ratio should also be applied by the multiples valuation method for a more comprehensive estimate. This paper uses the EV/EBITDA ratio of Volkswagen and its peer group at the end of the past three years to generate a more comprehensive outcome. According to data from the Finbox website, Volkswagen's EV/EBITDA ratios in 2021, 2020 and 2019 are respectively 7.6, 11.5, and 7 [10]. The corresponding ratio of Mercedes Benz, BMW, General Motors and Honda are respectively 9.3, 8.8, 4.4, and 9.8 in 2021, 25.3, 15.9, 5.7, and 13.3 in 2020, 17.1, 12.2, 5.7, and 9.2 in 2019. Then the average and median EV/EBITDA ratios of Volkswagen's peer group can be calculated, as shown in Table 2. After the above calculations, Volkswagen's actual EV/EBITDA ratio is smaller than its peer group's average and median ratios, which indicates that after multiplying by Volkswagen's EBITDA, Volkswagen's actual enterprise value will be less than the enterprise value predicted by the average EV/EBITDA ratio of peer companies. Therefore, Volkswagen's enterprise value is also underestimated when applying the EV/EBITDA ratio as the multiple.

**Table 2.** Average and median EV/EBITDA ratios for Volkswagen peers

	EV/EBITDA (2021)	EV/EBITDA (2020)	EV/EBITDA (2019)
Volkswagen	7.6	11.5	7
Mercedes Benz	9.3	25.3	17.1
BMW	8.8	15.9	12.2
General Motors	4.4	5.7	5.7
Honda	9.8	13.3	9.2
Average EV-EBITDA ratio of peer group	8.08	15.05	11.05
median EV-EBITDA ratio of peer group	9.05	14.60	10.70

In general, although this article used two multiples to predict the value of the Volkswagen, both ended up with the same result. When using the P/E ratio as the multiple, the forecast value shows that Volkswagen's current share price is undervalued; when using the EV/EBITDA ratio as the multiple, it is lower than the peer group's average ratio will generate a lower enterprise value than the estimated.

### 3. Discussion

In section 2, the paper successfully valued the predicted stock price and an enterprise value of Volkswagen Group with the multiple P/E and EV/EBITDA and concluded that Volkswagen Group is undervalued. This result suggests that the actual share price and enterprise value of the Volkswagen Group are lower than they should be. Although lower P/E ratios are not optimistic, some studies show that low P/E ratios can benefit companies somewhat. The value premium theory suggests that companies with lower average P-E ratios will generate more returns later than companies with higher average P-E ratios [11]. Furthermore, investors are more inclined to invest in undervalued companies because they believe that undervalued companies have tremendous growth potential in the future.

In applying the multiples valuation method, the author found that the research object's choice of comparable peer companies is subjective. Although some vague selection rules exist, there are no clear statements at the current stage. Moreover, using the multiples valuation method to evaluate a company's value has limitations. As mentioned above, choosing comparable peer companies will significantly affect the accuracy of the multiple. Nevertheless, in reality, each company's financial situation is different, and the subjectivity of choosing comparable peer companies is unsettling in financial forecasting and affects the accuracy and credibility of the multiples valuation method. The application of the P/E ratio also has its flaws. Earnings- and sales-based multiples ignore the impact of cash and cash equivalents, yielding the same value with or without cash, meaning that companies with much cash are undervalued when P/E ratios are applied. Meanwhile, the accuracy and bias of the value estimate are affected significantly by company size, profitability, and intangible assets value [1]. Fortunately, there has been researching and development in multiples valuation. For instance, one study established a systematic approach to selecting appropriate competitors, which calculates the "warranted multiple" for each firm based on sample estimations and identifies a firm's "peers" as those firms having the closest warranted multiple figures [6]. Selecting a more suitable comparable company will increase the accuracy of the multiple valuations. With the development of future research, the selection of comparable companies will provide researchers with more detailed and accurate reference specifications. Another study evaluates the effects of several multiples and provides a guide for the multiples chosen [1]. These studies improve the practice application of the multiples valuation method. However, although the multiples valuation method is widely used in practice, it cannot replace fundamental equity valuation models such as DCF and RIV. It can only be used to supplement the fundamental equity valuation model, making the company valuation more comprehensive [12].

### 4. Conclusion

The goal of this paper is to provide a practice case of applying the multiples valuation method in company valuation. The author chose five comparable peer companies of Volkswagen Group and collected their average P/E and EV/EBITDA ratios, applying them to Volkswagen's actual earnings per share and EBITDA. Then this paper compared the predicted share price and enterprise value with the actual figure and concluded that Volkswagen is undervalued. While a lower P/E ratio can be harmful, it can also attract investors who see undervalued companies as having growth potential. In applying multiples valuation, the author found that the limitation of the multiples valuation method affects the accuracy of study results. The selection of comparable peer companies is subjective and would affect the accuracy of applied multiples. Furthermore, the P/E ratio ignores the impact of cash and cash equivalents, causing the under value of companies holding too much cash. While the

multiple valuation method is flawed, existing and further research is continually developing and complementing this approach. Scholars have already conducted research and development on selecting comparable companies and different multiples applications. With the continuous development of research, the practical application of the multiples valuation method is bound to become more comprehensive and valuable as a supplement to fundamental equity valuation models.

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