The 6th International Conference on Economic Management and Green Development (ICEMGD 2022)
DOI: 10.54254/2754-1169/4/2022971

Hedge Strategy Analysis and Financial Analysis of Volkswagen

Yuqi Zheng[1,a,*]

[1]*Queen Mary University of London, Mile End Road, London E1 4NS, UK*
a. ml20782@qmul.ac.uk
**corresponding author*

Abstract: Good hedging strategies need to thoroughly analyze the financial situation, risks, and market changes faced by the company, and then make reasonable choices based on the actual situation. After this article analyzing various financial indicators of Volkswagen, it can be found that the stock price of Volkswagen fell to the bottom in 2020, then quickly recovered in 2021 and reached a peak in the observation period. This includes market factors such as Covid-19 and price fluctuations of raw materials, the recovery of Volkswagen's profits in 2021, and the hedging strategies like using interest rate derivatives made by Volkswagen Group in 2020. Although this article concludes with some shortcomings of its hedging strategies, overall, this company's hedging strategies are still very instructive, and in the future, it is promising to propose effective, value conscious hedging strategies to transform the company's risks into opportunities to increase shareholder's value so that the company can be more flexible to face some risks.

Keywords: Hedge, Risk, Financial.

1. Introduction

Volkswagen AG was founded in 1937 and the headquarters are in Wolfsburg, this company offers economy and luxury automobiles, sports cars, trucks, and commercial vehicles and serves customers all over the world. Volkswagen AG is the parent company of the Volkswagen Group. The Group includes ten brands from five European countries: Volkswagen, Volkswagen Commercial Vehicles, ŠKODA, etc. In addition to the production and sale of automobiles, the company also offers leasing, financing, and fleet solutions for customers [1-2].

Despite Volkswagen being a leading company in the automobile, it still has many risks in the financial area. For example, when considering the short-term solvency of Volkswagen, the relevant risk is liquidity risk. If the loan defaults, the credit risk will occur. Besides, there are many risks that are related to market factors since sometimes the market is unpredictable and volatile, such as the impact of Covid-19 and war. Because 2020 is the year when Covid-19 has the most severe impact on the world, the article mainly uses hedging strategies and some information in the 2020 annual report since they are representative. Therefore, this raises the question of how Volkswagen Group can hedge these risks and reap the benefits.

The aim of this article is to propose hedging strategies that are suitable for Volkswagen and discuss the applicability of the strategy in conclusion. This article will first introduce the basic information in section 2 and analyze the financial position and risks of Volkswagen in section 3, according to

DOI: 10.54254/2754-1169/4/2022971

these risks and then give some strategies to hedge risks in chapter4. At the end of the article, it will discuss these strategies and give some inspiration for future research.

2. Company Overview

2.1. Business Area

The Volkswagen Group has two divisions: Automotive Division and Financial Division. The Automotive Division contains three parts of the business area like the Passenger Car business area. Activities of this division are the development of vehicles, vehicle software, trucks, etc. The Financial Services Division's activities include dealer and customer financing, vehicle leasing, direct banking [3], etc.

Table 1: Main Corporate Financial indicators of Volkswagen AG in 2019-2021.

Aspect	Financial Indicators	2019	2020	2021
Profitability	Gross Profit Margin	19.45%	17.47%	18.88%
Growth	EPS Diluted	12.9%	-37.6%	78.3%
Credit	Debt Ratio	41.3%	40.9%	39.8%
Liquidity	Current Ratio	1.12	1.18	1.22
	Quick Ratio	0.77	0.85	0.88
Working capital	Accounts Receivable Turnover	3.40	2.96	3.42
	Accounts Payable Turnover	8.82	7.97	8.76

Source: Bloomberg

2.2. Financial Indicators

To assess and quantify differences between companies, rating agencies consider factors such as accounting ratios during the rating process [4]. There are many aspects this article will take into account: profitability, growth, credit, liquidity, and working capital.

From 2019 to 2021, Volkswagen has the lowest gross profit margin (17.47%) in 2020 due to the great impact of Covid-19, the Group's import and export trade, as well as the losses caused by the blockade, could have an impact on gross profit. During the same period, the diluted earnings per share experienced a negative figure, -37.59% in 2020, which means net income is negative and the company takes on greater risks. These values for the other two years are positive. When taking into account the credit and liquidity aspects of Volkswagen, these figures will be discussed in 3.1 and 3.3. In terms of the account receivable turnover and account payable turnover, the cycle of accounts receivable in 2020 is shorter, which is a good signal that the time for Volkswagen to recover money has become shorter, so that enterprises have more sufficient cash flow, but the cycle of accounts payable has also become shorter, which will reduce the cash flow of enterprises, although it can also be said that the recovery of funds is faster, resulting in a faster repayment cycle.

2.3. Stock Price

The risks of the company can also be derived from the fluctuations in stock prices.

During the financial crisis, Porsche tried to acquire Volkswagen, causing Volkswagen's stock price to soar briefly, making Volkswagen become the most valuable company in the world, however, it

DOI: 10.54254/2754-1169/4/2022971

was not long before Volkswagen's stock price began to fall sharply [1]. In 2015, Volkswagen’s stock price fell 16.6% on the day after the EPA investigation was announced due to the outbreak of the emissions scandal [5], but this is not the lowest point of the stock price in this decade. On 20th June 2019, the stock price of Volkswagen fluctuated at around €150 per share.

However, after 9 months, the stock price fell to around €100, which created the lowest price in recent years. And then the stock price of Volkswagen climbed steadily. These are because Volkswagen posted an operating loss due to lower sales in the second quarter due to the impact of Covid-19, and then returned to operating profit in the third quarter, driven by soaring demand for luxury cars in China. Volkswagen’s sales rose 9.7% in December 2020. In March 2021, the price of Volkswagen rose to approximately €340. This change in stock price includes not only Volkswagen's rising profits but also the rational analysis of the company's risk and the hedging strategies based on the risks. The following figure uses time as the horizontal axis, and the daily closing price or the processed closing price as the vertical axis to draw a line chart, which is regarded as a stock trend chart.

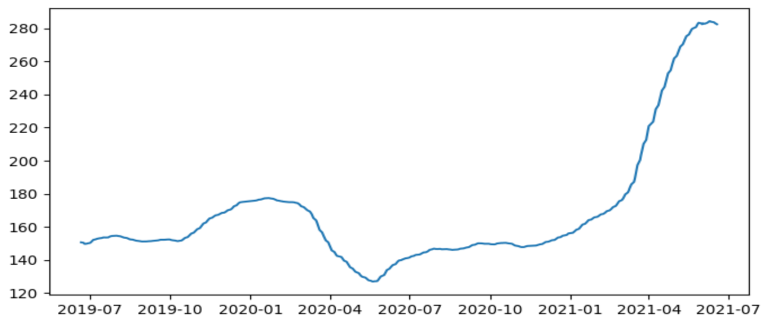

Figure 1: The stock price trend of Volkswagen changes in 2019-2021.

Source: https://finance.yahoo.com/quote/VOW.DE/history?p=VOW.DE

3. Financial and Risk Analysis

3.1. Liquidity Risk

Liquidity risks include the possible inability to raise funds to meet existing capital requirements or to fund the company on reasonable terms, which could be bad for business conditions, financial conditions, the profitability of Volkswagen, etc.

Although Volkswagen's Automotive and Financial Services Divisions are refinanced independently of each other, they face similar refinancing risks. Especially in the Automotive Division, its solvency is particularly important, which includes long-term and short-term solvency, measured by the current ratio, quick ratio, and debt ratio respectively, but the liquidity risk is mostly related to the current ratio and quick ratio [3].

3.1.1. Current Ratio and Quick Ratio

The current ratio indicates the company’s ability to pay back its short-term liabilities with short-term assets. The current ratio of Volkswagen is basically greater than 1, which means it could repay its short-term liabilities. However, this figure for Volkswagen is only around 1 during these years, which shows that the short-term liquidity reserve of the enterprise covers the short-term debt repayment; however, the company still has operational capital needs, which requires the enterprise's current ratio to be approximately 1.5 to 2.0, to meet the enterprise's capital needs other than debt repayment.

DOI: 10.54254/2754-1169/4/2022971

Similarly, the quick ratio is another ratio that could reflect short-term solvency, but it indicates the ability of the company to repay its quick assets. During the same period, Volkswagen's quick ratios are both lower than 1, which illustrates that Volkswagen doesn't have strong short-term solvency. This is consistent with the conclusions drawn from the observation corporate's current ratio.

3.2. Market Risk

Some market fluctuations are unpredictable and have a large impact, such as the market transactions of import and export trade brought about by covid-19 and the impact on financial markets. Besides, the unfavorable credit profile and outlook or downgrade or revocation of credit ratings may impede financing opportunities. In such a scenario, market participants' demand for securities issued by Volkswagen maybe decreases, which could negatively affect payable interest rates and create barriers to access to capital markets [3].

3.2.1. Interest Rate Risk

The interest rate risk emerges from long and short positions in maturities, nominal values, reset dates of instruments, and cash flows [6]; changes in the yield curve, which can be a parallel shift of the curve and change in its shape [7].

When the market rate has changed, Volkswagen may afford a potential loss. This is due to a mismatch in interest rates between assets and liability [3], that's why the article will focus on the debt ratio of 3.3.

3.2.2. Currency Risk

Volkswagen is a large multinational enterprise with many raw material suppliers and assembly businesses in different countries and regions and the automobiles are also exported all over the world, when transactions occur between different countries, fluctuations in different currencies and exchange rates also lead to currency risk.

3.2.3. Commodity Price Risk

There is a risk of volatility in commodity and energy prices in the market. Recently, the outbreak of the Russian-Ukrainian war has led to a shortage of energy supply. Energy in the life of ordinary citizens means the availability of fuel for private cars and public transportation. This situation gives Volkswagen a challenge regarding market price and sales volume. What's more, the hedging of commodity prices introduces risks associated with raw material availability and price trends [3].

3.3. Credit Risk

When considering the credit risk of Volkswagen, it is necessary to consider the risk of loss due to own default and client transaction default [3].

Focusing on the company's own default risk can be measured by the debt ratio. A debt ratio could be calculated as total debt to total assets, it enables comparisons of leverage to be made across different companies and measures the long-term solvency of a company. During these three years, most debt ratios are higher than 38%, if interest rates suddenly rise, the company could be at risk of defaulting on its loans.

In addition, a default occurs when a borrower or lessee is not able to repay the debt [3].

DOI: 10.54254/2754-1169/4/2022971

3.4. Counterparty Risk

Volkswagen is not only at risk of repaying its own debt, but if the counterparty partially or completely fails to meet its obligations to repay its interest and principal, it will have a negative impact on Volkswagen's profits and liquidity, which is caused by channeling excess liquidity into investments. Counterparty risk is caused by these derivatives contracts [3].

3.5. Residual Value Risk

When Volkswagen conducts financial service activities, it will face residual value risk. Because the expected fair value of the disposal of a lease or financial asset may be lower than the residual value set at the time the transaction is conducted, there is a residual value risk. And when Volkswagen is the bearer of direct residual value risk or the guarantor defaults on indirect residual value risk [3], the company’s financial services company will be affected.

4. Hedging Strategy

4.1. Broadly Diversified Refinancing Structure

Volkswagen has a wide range of businesses, and the huge product cost requirements and the capital requirements of the financial business are inseparable from project financing. One way of financing group projects is through loans provided by KfW or supranational development banks. In addition, the group can undertake a wide variety of refinancing structures to reduce the company's liquidity risk and remain solvent [3].

4.2. Using Interest Rate Derivatives and Natural Hedging

There are many kinds of market risks in Volkswagen. When Volkswagen wants to hedge the interest rate risk, it will combine it with currency risk and other interest rate contracts. However, these strategies apply to the automotive division. The financial services division should have good management of these derivatives [3].

Since hedge interest rate risk should consider currency risk at the same time, this article will analyze how to hedge the currency risk in the following step. Volkswagen reduces foreign currency risk through natural hedging, i.e., by flexibly adjusting its production capacity around the world and procuring most components locally [3]. Producers have moved some of their production to the foreign exchange area. In this way, the demand for foreign exchange within the affiliated group is balanced to a certain extent, which is a risk transfer for its suppliers [8].

Besides, Volkswagen hedged the residual foreign currency risk using currency forwards and currency options. These transactions could protect Volkswagen from currency risk associated with operating activities, intragroup financing, and forecasted cash flows of liquid positions[3]. Except for currency forwards and currency options, Volkswagen also can enter currency swap contracts which could get better local currency loan rates.

4.3. Forward Contracts and Swaps

Another type of market risk is caused by fluctuations in commodity and raw material prices. Volkswagen uses forward contracts and swaps to limit this risk. For example, it uses appropriate contracts to hedge some of the requirements for commodities such as copper for a period of up to six years, in the case of nickel for up to nine years. Compared to precious metals platinum have shorter hedging periods three years [3].

DOI: 10.54254/2754-1169/4/2022971

4.4. Counterparty Risk Management

Volkswagen uses hedge accounting to limit the financial instruments held for hedging purposes giving rise to counterparty risks [3]. Simultaneously, the enterprise diversely chooses business partners to control the scope of default.

4.5. Regular Assessment and Management

This method applies to hedge the residue value risk and credit risk when there are financial services activities in Volkswagen.

The first step for the company is appropriately accessing the potential residue risk and credit rating of borrowers. After accessing the potential risk, Volkswagen depended on the potential residual value risk that arises, various measures are taken to control this risk. For new businesses, the current market situations and future influencing factors must be taken into account in the residual value recommendation [3]. When it comes to credit rating, highly rated borrowers were being created based on baskets of relatively poorly rated bonds, by dividing risks into different levels of loss bearing buckets [9]. Rating and scoring systems are treated as the basis for granting loans and leases and confirming risk readiness [3]. This step is very critical to the enterprise, which determines the level of an enterprise's risk management [10].

If Volkswagen faces a loan default or other credit event, it could use a credit default swap to compensate for the loss when a loan default or other credit event. What's more, Jaworski and Liberadzki indicate that like hybrid security previously issued by Volkswagen in times of financial stress, this provided the issuing company with the ability to avoid paying coupons, which also gave Volkswagen a 50% equity credit from the rating agency. However, hybrid stocks often have multiple options embedded (call option, coupon deferral), which affect spreads. In the long term, this could jeopardize the ability of issuers to refinance their unsolicited debt [5], thereby affecting this company hedges other risks such as liquidity risk.

4.6. Data of Hedging

In the 2020 Annual Report, the remaining item of interest rate swap, currency forwards/cross currency swaps, and currency options are €18225million, €46761million, €8406million respectively, and the currency risk is not hedged perfectly because the recognized profit or loss is not equal to 0(According to the gain or loss from changes in the fair value to determine the effectiveness of hedging) [3].

5. Conclusion

5.1. Conclusion of Findings

This article mainly analyses the financial situation and risks in Volkswagen between 2019 and 2021 and on the basis of risks, some hedging strategies are proposed to minimize the risk of Volkswagen, like a broadly diversified refinancing structure, using interest rate derivatives and natural hedging, having counterparty risk management, etc.

5.2. Limitations

Volkswagen uses natural hedging and some currency derivatives to hedge the currency risk. Natural hedging means intentional risk transfer. In the long run, price developments cannot be hedged, and suppliers and customers must take this into account during the planning stage. Like "classic" hedging, natural hedging does not guarantee 100% of the risk. Besides, Zhang finds that non-financial firms are ineffective in hedging currency risks, and financial firms are more likely to use currency

DOI: 10.54254/2754-1169/4/2022971

derivatives for speculation. As a major automobile manufacturing company, using currency derivatives to hedge currency risk does not seem to be a good choice, and the complexity of natural hedging may also lead to the risk of useless hedging, but Volkswagen's strategy of hedging currency risk cannot be completely denied, because it is better for a company to try to reduce risk rather than ignore it.

As a large company, Volkswagen has a better advantage in taking and managing some risks. However, it may lose money when Volkswagen pays too much attention to others. Comparative advantage in risk means that companies could focus on managing the risks for which they have a comparative advantage while transferring other risks to investors or other companies that are more capable of taking on those risks. So only for this aspect, it is not necessary for Volkswagen to hedge many kinds of risks.

5.3. Suggestions and Implications for Future Research

Using hedging strategies could reduce risks to some extent, but it cannot eliminate them. Sometimes, the risks and opportunities coexist. Maybe in the near future, the corporate could learn how to convert their risks to increase the shareholder's value through effective, value conscious hedging strategies.

References

[1] *Baur D G. Case Study: Porsche versus Volkswagen[J]. Available at SSRN 2649141, 2015.*
[2] *Thimm A. Assessing default risk of a public company: An empirical analysis on the basis of Volkswagen AG[D]. Universidade Catolica Portugesa (Portugal), 2013.*
[3] *Shefrin H. Behavioralizing finance[J]. Foundations and Trends® in Finance, 2010, 4(1–2): 1-184.*
[4] *Jaworski P, Liberadzki K, Liberadzki M. On Behavior of the Hybrid Securities When Issuer Is in Distress: The Volkswagen AG Case[J]. Available at SSRN 3347928, 2018.*
[5] *Bodie Z, Kane A. Marcus, Investments, 11th ed. San Diego: McGraw-Hill Education, 2018, pp. 480-966.*
[6] *Damodaran A. Investment philosophies: successful strategies and the investors who made them work[M]. John Wiley & Sons, 2012.*
[7] *Hofmann E. Natural hedging as a risk prophylaxis and supplier financing instrument in automotive supply chains[J]. Supply Chain Management: An International Journal, 2011.*
[8] *Trueck S, Rachev S T. Rating based modeling of credit risk: theory and application of migration matrices[M]. Academic press, 2009.*
[9] *Zhang X. Multinational companies' hedging effectiveness of foreign exchange risk: A quantitative comparison study[J]. Fudan Journal of the Humanities and Social Scienc-es, 2021, 14(2): 285-302.*
[10] *Stulz R. How companies can use hedging to create shareholder value[J]. Journal of Applied Corporate Finance, 2013, 25(4): 21-29.*