

The Hedging Policies of BP with the Systematical Analysis

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ABSTRACT

The article provides a general overview of BP's hedging policy. We analyze how the company hedges risks and risks the company hard to hedge. BP is a multinational oil and gas company, the main risks in the area of swapping the economic exposure and managing its normal business exposures. Based on analyzing data from annual reports of BP and comparing with the SHELL, we estimate how BP hedges risks. BP mainly used financial derivatives instruments such as futures and options to hedge risks such as market risks. Except for price and market risk, our study also finds that climate change and geopolitical risk are hard to hedge for BP. Our research may provide some reference for the company like BP to make hedging strategies in the future.

Keywords: *Hedging policy, BP, financial derivative, oil and gas industry*

1. INTRODUCTION

BP PLC is a multinational oil and gas company operating in all fields of the oil and gas industry, including exploration and production, refining, distribution and marketing, power generation, and trading [1]. The company operations in Europe, North and South America, Australasia, Asia, and Africa in more than 70 countries around the world, and the market capitalization of BP is \$77.4 billion in 2020 [2]. Due to the development of North Sea oil resources and the increased economic strength of the United Kingdom since the 1980s, the strength of the company continues to grow. And BP also was the first of the major Western oil companies to start trading in oil cash in the early 1980s, it has been more than forty years till now.

Oil and gas companies can use derivatives to actively manage business risks like low commodity prices, high interest rates, and negative currency exchange rates [3]. In the normal course of the business, BP uses derivative financial instruments to hedge risks regarding commodity prices, foreign currency exchange rates, and interest rates [4]. The international businesses caused the interest rate

risk, especially the US dollar floating. Company try to use derivatives to hedge risks in this area. BP usually uses contracts in the shape of future and options to hedge the risks for the uncertain market price of commodities such as oil, natural gas, and power prices.

In this paper, we discuss the hedging policies of BP. For a multinational oil and gas company, BP mainly uses financial derivatives to hedge the market risk. We use data from the annual reports to make some models for comparing to analyze how the company uses financial derivatives to hedge the market risk. In the second part, we compare some BP hedging policies with SHELL to evaluate the differences of different company's hedging policies. Last and most importantly, we analyze other risks that are difficult to be hedge for the company, such as climate change.

2. HOW BRITISH PETROLEUM USES DERIVATIVES TO HEDGE RISKS

As one of the largest oil and petrochemical group companies in the world, BP faces several risks in the process of production and management. In general, firms are exposed to various risks, including credit risk,

liquidity risk, foreign exchange risk, market risk and interest rate risk. An efficient risk management system is needed in time to control these risks [5]. For British Petroleum, the financial risk factors they meet include credit risk, liquidity risk and market risk.

Credit risk is the possibility of a loss resulting from a borrower's failure to repay a loan or meet contractual obligations [6]. For BP, credit risk is that a customer or counterparty to a financial instrument will fail to perform or fail to pay amounts due causing financial loss to the group and arises from cash and cash equivalents, derivative financial instruments and deposits with financial institutions and principally from credit exposures to customers relating to outstanding receivables.

Liquidity is the ability of a firm, company, or even an individual to pay its debts without suffering catastrophic losses [7]. For this company, liquidity risk is the risk that suitable funding sources for the group's business activities may not be available. BP need to keep their cash flow flexible

As one of the most typical financial risks, the market risk can't be avoided for all international companies worldwide. Market risk is the possibility that an individual or other entity will experience losses due to factors that affect the overall performance of investments in the financial markets [8]. For BP, market risk is the risk or uncertainty arising from possible market price movements and their impact on the future performance of a business. All three of these risks can have a significant impact on a company's profits if left unchecked. In addition to standardizing the company's operating system and continuously ensuring the complete operation of the supply chain, the company can also hedge risks through financial derivatives.

Here, BP faced two kinds of market risk. Firstly, commodity price risk. The primary commodity price risks that the group is exposed to include oil, natural gas and power prices that could adversely affect the value of the group's financial assets, liabilities or expected future cash flows. However, we all know the value of these commodities is highly unstable. It would depend on so many factors like politics, economics and so on.

Here, we can analyze the price changes in combination with a crude oil price trend. And for BP, as a company that sells oil to gain profit, they wish the price could be higher obviously, but they can't forecast the future price. Here they can use derivatives for hedging the risk. For example, sign a forward contract with another party or company who uses oil for production in 2015 when the price is relatively high, agreed to sell the oil at 52 dollars per barrel after a year, this would allow the company to significantly reduce its exposure to commodity prices when oil prices hit a low point in 2016. BP can get the profit from the difference between the

current price and the underlying price at maturity.

Secondly, foreign currency exchange risk. Commodities are largely settled in dollars in the international market. Changes in the dollar exchange rate to other foreign currencies have a huge impact on BP's revenue and earnings. For example, from 2017 to 2018, the exchange rate of dollar to euro decreased according to the dollar/euro exchange rate data over the recent six years. It is beneficial to European buyers to see the exchange rate dropped. However, BP can buy the future contract of euro to the dollar at a good price which can hedge the foreign currency exchange risk when the dollar depreciates.

We can see the company's derivative assets from 2017 to 2020 (Figure x). We convert the data into a more intuitive line chart. From the chart, we can see the net amount of derivatives assets of BP grew during the four years at a considerable speed. This suggests that companies are increasing their use of derivatives to hedge their market risk.

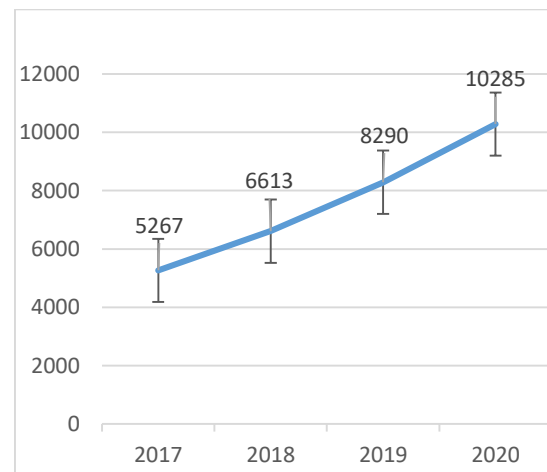


Figure 1. The derivative assets of Bp in 2017-2020

Next, these data show the different types of financial derivatives held by companies have different types include oil price derivatives, natural gas price derivatives and so on(Figure x). We can see the amount changes of these kinds of derivatives and the total number. The numbers show that BP is expanding its holdings of derivatives, especially in the total amount. Natural gas price derivatives account for nearly half of the number.

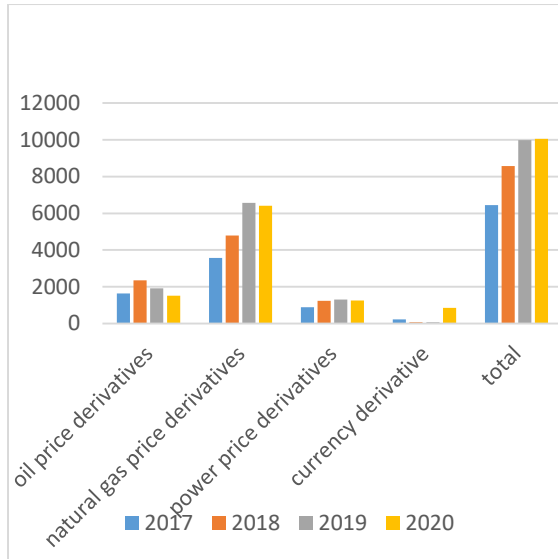


Figure 2. Bp' derivatives held for trading

Lastly, we found that BP is more likely to keep derivatives that would mature less than one year or more than five years. This is related to the characteristics of the price changes in the derivatives held by the company. Commodities and currencies usually move quickly.

3. BP AND SHELL'S FINANCIAL DERIVATIVES

As the largest oil company located in the Netherlands

Table 1. Relative participation scale (α)

YEAR	2010	2011	2012	2013	2014	2015	2016	2017
BP	3.71	4.60	2.95	2.31	4.19	3.95	3.96	3.16
SHELL	9.41	7.44	4.40	3.15	7.80	5.81	3.06	2.70

Table 2. Financial impact indicators (θ)

YEAR	2010	2011	2012	2013	2014	2015	2016	2017
BP	-38.40	0.84	-3.55	2.50	162.80	-84.97	1247.83	58.51
SHELL	-15.96	-6.33	-3.40	6.62	40.70	211.81	9.05	10.18

As shown from Table 1, the relative participation scale indicator can show the proportion of the company's use of derivatives. From the data, it can be seen that BP's relative participation scale indicator is relatively stable every year, staying around 3.5%, with an average value of 3.60%. However, this indicator of SHELL has relatively large fluctuations relative to BP. The highest is 9.41%, the lowest is 2.7%, and the average is 5.47%.

and the UK, BELL has considerable experience in financing, management and hedging activities. Then, let make a comparison between these two oil companies.

BP and BELL both use financial derivatives to manage their exchange rate, interest risk, block price and transaction risks. In the bookkeeping process, derivative financial instruments will be recorded at their fair value on the day they enter the contract, and then their fair value will be remeasured. Because the cost cannot be measured reliably, the relevant unlisted core derivative instruments are accounted for at cost value. Derivative financial instruments with a positive diamond value are counted as assets, and those with a negative cost value are counted as liabilities.

Therefore, in the process of measuring the scale of a company's derivatives, the combination of derivatives assets and derivatives liabilities should be more in line with the definition of "participation scale". Let "Relative participation scale index" be α , asset items be β , total assets be γ , liability items be δ , total liabilities be ε , financial impact indicators be θ , derivatives' gain and loss be μ , total revenue be σ .

$$\alpha = (\beta \div \gamma + \delta \div \varepsilon) \div 2 \tag{1}$$

$$\theta = \mu \div \sigma \tag{2}$$

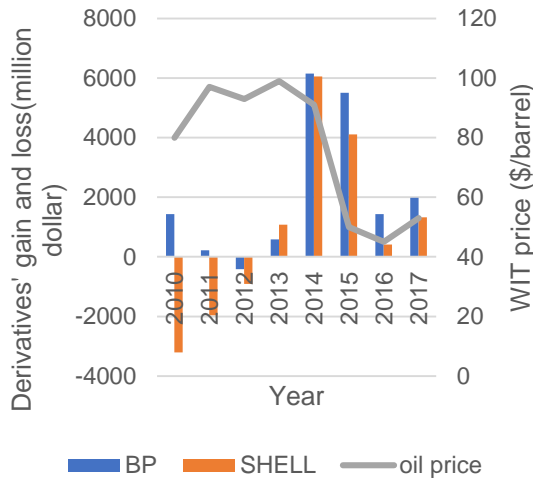


Fig. 3 The derivatives gains and loss comparison between BP and SHELL

In terms of financial impact indicators, due to the dual effects of derivatives profit and total profit, the fluctuations are relatively severe. To make a more intuitive comparison, we combined the international crude oil price trends in the past eight years and the respective derivatives gains and losses of the two companies. As shown in Figure 3, it can be seen that in the years when oil prices fell, the two companies usually achieved positive returns on derivatives, indicating that the various derivatives used by them have indeed played a role in hedging risks. From the chart, we can say that BP's overall performance in derivatives profit and loss is better than SHELL, which is only slightly lower than SHELL in 2013. Since 2010, BP's average income on derivatives has been 2.112 billion U.S. dollars, and SHELL has been 863 million U.S. dollars.

The previous table 2 has intuitively demonstrated the good performance of oil companies using derivatives to hedge risks. The data shows that the use of derivatives contributes to the stability of the company's finances. Taking BP as an example, the annual profit and the standard deviation of the profit rate, including the derivative gains and losses, are lower than the value after deducting the derivative gains and losses. The standard deviation of the profit amount, including derivatives gains and losses, is US\$12.002 billion, and the standard deviation after deduction is US\$13.557 billion. This is equivalent to BP's use of derivatives reduce the annual profit fluctuation of US\$1.555 billion. It can be seen that the reasonable use of derivatives does help BP stabilized its profits.

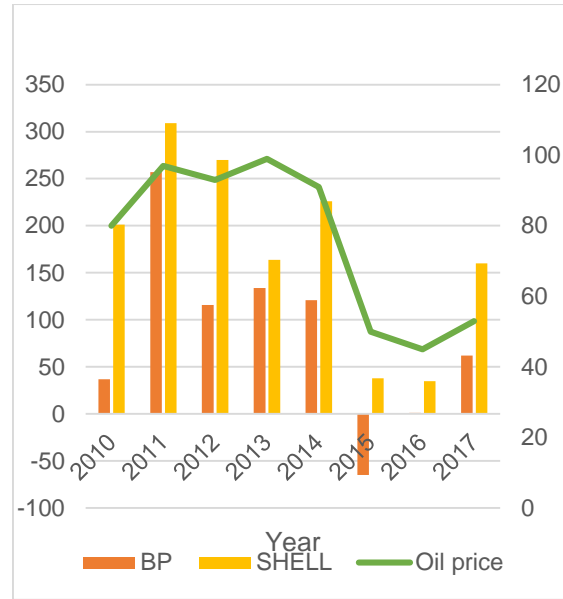


Fig. 4 The annual profit data of BP and SHELL and the trend of international oil prices

Figure 4 compares the annual profit data of the two oil companies from 2009 to 2017 and the trend of international oil prices. We can see that the profits of oil companies rely heavily on the trend of crude oil prices. Therefore, if derivatives are not used for hedging, their profits will be impacted significantly. Taking BP as an example, there are two years of losses in the chart. This time in 2010 was due to an oil spill in the Gulf of Mexico, which seriously affected the company's profits (derivatives brought considerable profits in that year). In 2015 it was due to a sharp drop in oil prices when the average oil price fell by 47%. In 2015, BP's profit was \$-6.482 billion. Without the \$5.508 billion profit on derivatives, its financial statements would be even more unacceptable for shareholders. Therefore, using financial derivatives can be useful to hedge market risk and compensate for credit risk. And BP has benefited a lot from its excellent hedging activities.

4. RISKS ARE DIFFICULT TO HEDGE

What types of risks are more difficult to hedge than others for our chosen company-BP? Or the risks that even cannot be hedged. This is a question that we next put our focus on.

As we all know, there are various risks, and BP is in a very disadvantaged complex environment. In this section, this paper presents three important risks belong to the strategic and commercial risks department. They are prices and markets, climate change and geopolitical. As for my three types of risks, which one is more difficult to hedge than others? This is the question this section will deliver the answer after we do the analysis.

First one is price and markets risk. It includes four aspects: fluctuating prices of oil, gas and refined products,

technological change, exchange rate fluctuations, and finally, general macroeconomic outlook. In this risk category, financial derivatives such as futures and options can be used to hedge fluctuation prices of oils, gas and refined products in BP because the nature of the business operations is long term, resulting in many of the risks being enduring in nature. So, futures best. Technology change can be hedged by investing in this area. The diverse locations of the operations around the world expose us to exchange rate risk and geopolitical risk. To hedge exchange rate risk, swaps best serve our objective. And, of course, the risk management team will have a closer look at the general macroeconomic outlook.

The second one is climate change risk. As the paper discussed, this is a risk that hardly can be hedged by some financial tools. Here I listed two reasons to explain why this kind of risk is hard to hedge. Development in policy, law, regulation, technology is hard to predict, and market influence is inevitable. And moreover, societal perspectives and investor sentiment can impose a massive effect on the oil industry. Therefore, we focus on how this will affect BP and the whole oil industry. As a result of the climate change factor, for BP, there must have bad influences such as cost increase and operations limitations. For example, China already published some limitations on the total amount of carbon emission for every company. You cannot exceed this amount yearly, or else you have to buy an additional amount which definitively will increase the cost for companies. Therefore, similar policies imposed by governments or international bodies can also harm the business plans and financial performance. However, seeing from a bigger picture, green companies and green finance will create a green environment and healthy earth we live on. Yang et al. [9] research findings show that huge benefits can be generated, such as many resources can be saved though there is a huge potential to improve. That improvement is made by cutting e-waste, for example.

Finally, part is the geopolitical risk (GPR). As mentioned early, BP is doing business in different countries and locations, and they have to deal with exchange rate risk and geopolitical risk for the good of the company. There are three indirect risks embedded in this risk category. The first point is geopolitical risk is exposure to a range of political developments. Following there is environmental regulation, and as a result of the two points, BP has to deal with consequent changes to operating, so geopolitical risk leads to business disruption. Evidently, many papers focused on and analysed the relationship between GPR and the finance market. Gkillas et al. [10] found there was no evidence that GPR had an influence on market volatility, indicating GPR is not only hard to detect but also cannot be hedged. Other risks may also induce business disruption, such as covid-19, and we cannot hedge covid-related risk before head as we did in our futures because we cannot predict the future.

In this section, we talked about some strategic and commercial risks in general, and financial genius has designed and invented the complex and cute financial derivatives for us all to hedge prices and markets risk. Still, we also learned that some risks could be hardly hedged, such as climate change and geopolitical risks. Looking back, the covid impact lasts almost 2 years, and it still impacts us in many ways or even our life decision. These kinds of risks cannot be hedged because we cannot predict the future.

5. CONCLUSION

In this paper, we mainly analyze the hedging policies of BP. They use derivatives to swap the economic exposure to a floating rate basis and control the risk of price fluctuations for commodities. According to the analyzed data from the annual reports of BP, BP is good at using derivative financial instruments to hedge risks in normal business. Based on the data, the use of BP's derivatives contributes to financial stability, and BP performed in derivatives better than SHELL. Except for the normal business, there still are several risks, such as climate change for BP which are hard to solve, BP may solve them better with better hedging policies. Further work needs to be done to establish whether the company can hedge the unpredictable risks in future business.

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