Financial Characteristics and Risk Strategy Analysis of Oil Giant Companies under The Background of Global Economic Recession

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Abstract. In the context of the evolving energy industry, this study provides a comparative analysis of two industry giants, ExxonMobil and Royal Dutch Shell. The study aims to examine their financial health, with a particular focus on three key metrics: leverage, weighted average cost of capital (WACC), and asset Beta (βa). The study adopted quantitative research methods to carefully collect and analyze the financial data of the two companies. The results revealed striking differences in their financial characteristics. ExxonMobil is more leveraged, with a WACC about 4 percent higher than Royal Dutch Shell and an asset beta of 1.01, indicating greater sensitivity to market volatility. In contrast, Shell has lower leverage, a low WACC and an asset beta of 0.49, reflecting a more stable market reaction. These results underscore the critical importance of aligning financial structures with strategic objectives. ExxonMobil's conservative financial strategy may help reduce risk, while Shell's lower cost of capital may provide a competitive advantage in seeking investments. In conclusion, this study reveals the critical role of financial dynamics in the energy sector, providing valuable insights for investors and industry stakeholders. Future research may explore additional financial metrics and industry-specific factors to further enrich our understanding of these companies' financial strategies.

Keywords: Financial Health, ExxonMobil, Third Keyword.

1 Introduction

Due to high inflation, rising interest rates, reduced investment, the Ukraine crisis and other factors, global economic growth is slowing to the point of recession in the post-pandemic era. The World Bank released its latest Global Economic Prospects report in January 2023, lowering its forecast for global economic growth in 2023 to 1.7%, down 1.3 percentage points from the June 2022 forecast and the third lowest level in nearly 30 years [1]. And the instability caused by the recession has hit oil majors hard. The oil and gas industry itself has a wide range of social implications, both positive and negative. On the beneficial side, the oil and gas industry provide energy sources for many productive sectors. A lot of transportation needs oil. Oil is also one of the

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world's most traded commodities. On the harmful side, the development and utilization of oil and gas will bring about environmental pollution problems. At the same time, the competition for oil and gas resources may bring geopolitical conflicts. Under the background of economic recession, the operating risk and financial risk of oil companies will undoubtedly increase. At the same time, oil companies' business strategies will change. COVID-19 has had an impact on the oil and gas industry. The short-term impact would be a nearly 25% reduction in oil consumption, a slow return to previous levels, and even more growth. The long-term impact is a 30 to 40 percent reduction in capital expenditures and R&D investment in the oil and gas market, a regional scale in the United States, resulting in a decline in oil extraction projects from more than 800 in 2019 to 265 in 2021 [2]. For the subsequent analysis of the strategy and risk of the entire oil industry, ExxonMobil and Shell will be the two major oil giants as analysis objects. They not only have a pivotal position in the scale of operations, but also have an important impact on the future sustainable development of the environment. The two oil giants operate operations that have emitted large amounts of greenhouse gases over the past few decades and have a profound impact on global warming. And their environmental declaration could serve as a model for the entire oil industry [3]. How will the two oil giants' business strategies change under the impact of the recession? How will the risks of the two oil companies differ? What changes do they need to make within their original business? Some of the problems need to be further discussed. This study is based on the financial data of ExxonMobil and Shell from 2018 to 2023 to explore the differences in business strategies and risk tolerance of the two oil giants during the economic downturn after the impact of the pandemic. The study focuses on three metrics, namely weighted average cost of capital (WACC), leverage (D/E, debt-to-equity ratio), and asset beta (βa). These metrics will provide insight to help readers understand the financial health, risk tolerance and market sensitivity of the two companies. By delving into their financial characteristics and risk management strategies, readers can gain a better understanding of the dynamics and challenges of the oil industry and how companies respond to changing market and environmental conditions. After calculating secondary financial data through financial formulas, the implications of these results will be discussed, providing readers with insight into the two oil companies.

2 Financial Analysis

2.1 Leverage (D/E, Debt-to-Equity Ratio)

Table 1. Leverage.

	XOM (ExxonMobil)	SHEL (Shell)
MV Equity (E)	466,130,000,000.00	209,640,000,000.00
MV Debt (D)	41,500,000,000.00	84,360,000,000.00
V (E+D)	507,630,000,000.00	294,000,000,000.00
D / V	8.18%	28.69%
Leverage (Debt-to-Equity Ratio, D/E)	8.90%	40.24%
E / V	91.82%	71.31%

Leverage ratio is the ratio of debt to equity and it reflects the extent to which a company uses debt capital to finance its operating and investment activities. The appropriate leverage ratio depends on the industry, the economic environment and financial objectives [4]. It can help policymakers determine whether they need to reduce debt, increase capital, or maintain the existing capital structure. Leverage ratio can help assess the level of financial risk of a business. The leverage data mainly comes from two parts, debt and equity. In the analysis, the market value of debt and equity is used to calculate the analysis. The two data sources are the companies' annual financial reports and financial data network providers (such as Yahoo Finance). It can be clearly seen that ExxonMobil's equity market value is 466.13 billion, while Shell's equity market value is 209.64 billion, and ExxonMobil's equity market value is more than twice that of Shell. Exxon Mobil's debt market value is $41.5 billion, and Shell's debt market value is $84.36 billion. Shell's debt market value is more than twice that of Exxon Mobil. So naturally, when leverage is calculated by dividing the market value of debt by the market value of equity, ExxonMobil is four to five times more leveraged than Shell.

Impact analysis: Shell's higher leverage ratio indicates that the company is relying more on debt financing in its capital structure. High leverage can increase financial risk as debt needs to be repaid regardless of the company's performance. Before and after the epidemic, compared with ExxonMobil, Shell invested a larger scale in renewable energy and clean energy, while ExxonMobil emphasized the scale of operation in the traditional oil industry [5]. Shell is ahead of ExxonMobil on a clean and sustainable path. The energy transition will cause the capital structure of corporate investment to favor more debt. This is mainly due to a shift in investment to sectors such as electricity, where debt financing is more prevalent, and a greater emphasis on financing models to support households buying electric vehicles and improving buildings and factories. Mobilizing investment across sectors will depend on financial flows from local as well as international investors. The most likely route for international project developers, commercial banks and other investors to participate in related projects is to invest in renewable energy power. This requires Shell to manage debt repayment plans to ensure financial soundness. Shell needs to ensure its cash flows are sufficient to support debt repayments to avoid the risk of defaulting on its debt. In contrast, ExxonMobil has a lower leverage ratio, indicating that the company relies more on equity financing and uses less debt capital in its capital structure. This can be interpreted as companies taking a more conservative stance on financial risk and perhaps placing more emphasis on financial soundness.

Overall, the difference in leverage ratios between ExxonMobil and Shell reflects their different preferences in capital structure and financial risk management. Shell's high leverage ratio may help reduce the cost of capital, but it also comes with financial risks. Exxon's lower leverage ratio may contribute to solid financial performance, but may be subject to a higher cost of equity. Both companies need to carefully manage leverage in line with their strategic objectives and market conditions to ensure their financial soundness and risk tolerance (see Table 1).

2.2 Weighted Average Cost of Capital (WACC)

Table 2. WACC.

	XOM (ExxonMobil)	SHEL(Shell)
Cost of equity:		
R_f	2.22%	2.22%
R_m	10.50%	10.50%
β_E (Beta (5Y Monthly))	1.08	0.65
R_e	11.16%	7.60%
Cost of Debt:		
R_d (YTM)	4.33%	5.46%
MV equity (E):	466,130,000,000.00	209,640,000,000.00
MV debt (D):	41,500,000,000.00	84,360,000,000.00
V(E+D)	507,630,000,000.00	294,000,000,000.00
Tax rate (US corporate tax rate)	21%	21%
D/V	8.18%	28.69%
E/V	91.82%	71.31%
WACC	10.53%	6.66%

WACC is an important concept in corporate financial management, which represents the total cost of corporate financing and is the weighted average of equity capital and debt capital. How does the Weighted Average Cost of Capital (WACC) affect business investment? Both components of the WACC, the increase in the cost of debt and the cost of equity, are associated with lower investment rates. A rough calculation shows that the rise in WACC after the eurozone crisis reduced the aggregate business investment rate of French private firms by a cumulative 1.6 percentage points between 2009 and 2015 [6]. Businesses can use WACC to determine the most cost-effective financing structure, which is a mix of equity and debt. Generally, by adjusting the ratio of equity to debt, the overall cost of financing can be reduced. WACC is also used to estimate the value of a business. By discounting the future cash flow of a business to present value, the total value of the business can be estimated using WACC as the discount rate. This is useful information for investors, shareholders and potential acquirers alike. It is important to know that the WACC is calculated using the following formula:

$$WACC = (E/V) * Re + (D/V) * Rd * (1 - T) \quad (1)$$

The E/V and D/V data are available in the leverage analysis, so they can be used directly. Rd is the expected debt cost (interest rate) of the debt, calculated using the newly issued bond rate of the two companies. T is calculated using the US corporate tax rate, so T is a uniform value for both companies. However, in the process of research, it is necessary to use CAPM model to calculate the Expected rate of return (Re). Here is the formula for the CAMP model:

$$R_e = R_f + \beta_E * (R_m - R_f) \quad (2)$$

Therefore, the average value of US Treasury Yield in recent five years was used as Rf (Risk free rate), and the data of βE was selected with 5 years monthly as the time span standard. For Rm (The expected rate of return of the market), select the SNP Real Time Price of S&P 500 index (2018 as the beginning price year). 2023 as the year of the ending price) is calculated.

$$R_m = (\text{Ending Price} / \text{Beginning Price}) \wedge (1/n) - 1 \quad (3)$$

$$n = \text{The number of years during the investment period} \quad (4)$$

Finally, ExxonMobil's WACC is 10.53% and Shell's WACC is 6.66%. Shell's lower WACC indicates the company's relatively low cost of capital, which may be related to the company's capital structure and cost of debt. This situation could have a positive impact on Shell's investment projects, as a lower WACC means a lower minimum return requirement. A low WACC can increase the attractiveness of an investment project as it requires the project's internal rate of return (IRR) to exceed WACC in order to create shareholder value. Shell may use debt to reduce its WACC, as interest payments on debt are usually deductible before tax, lowering the cost of capital [7]. Shell may have a competitive advantage in the market when looking for new investment opportunities, as its lower cost of capital can help boost its return on investment. A higher WACC could lead ExxonMobil to choose its investment projects more carefully to ensure that the potential returns from the projects more than compensate for the high costs. A high WACC may increase a company's financial risk as it needs to bear higher debt costs and may face higher debt stress.

Overall, the differences between ExxonMobil and Shell in WACC reflect differences in their capital structures, debt policies, and market positions. Shell's lower WACC makes it potentially more competitive when looking for new investment and growth opportunities, while ExxonMobil may need to evaluate investment projects more carefully to ensure they meet high-cost capital requirements (see Table 2).

2.3 Asset Beta (βa)

Table 3. Asset Beta.

	XOM（ExxonMobil)	SHEL(Shell)
Cost of equity:		
Rf	2.22%	2.22%
Rm	10.50%	10.50%
βE(Beta (5Y Monthly))	1.08	0.65
Re	11.16%	7.60%
Cost of Debt:		
Rd(YTM)	4.33%	5.46%
MV equity(E):	466,130,000,000.00	209,640,000,000.00
MV debt(D):	41,500,000,000.00	84,360,000,000.00
V(E+D)	507,630,000,000.00	294,000,000,000.00
Tax rate(US corporate tax rate)	21%	21%
D/V	8.18%	28.69%
βA(Business RIsk)	1.01	0.49

Asset beta is a financial metric used to measure the market risk sensitivity of a company or asset relative to the overall market. The following formula is used to calculate the beta of an asset:

$$\beta_a = \beta_E / ((1\text{-}T * (D/V)) / (1 - D / V)) \quad (5)$$

Among them, the required values of βE, T, D/V have been obtained above, so the value of βa of the two companies can be directly calculated. Typically, the market itself has a beta of 1.0, and if a company or asset has an asset beta greater than 1.0, it is more sensitive than the market, while if it is less than 1.0, it is relatively less sensitive. In these findings, ExxonMobil exhibits a beta (βa) of 1.01, and Shell records a beta of 0.49. The asset beta of the ExxonMobil exceeds 1, indicating that its asset price volatility surpasses the market average. Consequently, ExxonMobil's stock price may demonstrate greater fluctuations during periods of market instability, often categorizing it as high-beta entity. High-beta companies can exhibit heightened susceptibility to market volatility, requiring investors to factor in increased systemic risk. Conversely, Shell's asset beta falls below 1, or even dips below 0.5, classifying it as a low-beta company. Consequently, Shell demonstrates relative stability, with its share price showing less fluctuation compared to the broader market. There are two possible main reasons:

Differences in Global Investment Distribution. Shell conducts oil and gas exploration operations in approximately 50 nations, engages in oil refining activities across 34 countries, and markets oil in excess of 150 countries. Turmoil in one location has minimal repercussions on the overall corporation [8]. Shell's investment portfolio is characterized by a notable degree of diversification. This is true even in a recession.

ExxonMobil's strategic plan for 2023 primarily allocates the majority of its annual investment budget to the Americas. Approximately 70 percent of this budget will be directed toward projects in the Permian Basin, Guyana, Brazil, and global liquefied natural gas (LNG) initiatives [9]. This focus on the Western Hemisphere is expected to persist for several years as Exxon prioritizes enhancing shareholder returns and scaling back on high-cost remote drilling ventures. Notably, Exxon Mobil is divesting from Southeast Asia, West Africa, Russia, and select regions in Latin America, marking a period of downsizing after decades of global expansion.

The diversified investment portfolio serves to lower the company's asset beta and mitigate business risks. Consequently, Shell's stock price displays less volatility compared to that of Exxon Mobil.

Upstream Business Adjustment Brought about by the Energy Transition. Shell is swiftly transitioning towards clean energy solutions, and as a result, it has significantly revised down its production outlook. Shell's strategic focus is gradually shifting towards renewable energy and power markets, with plans to reduce oil and gas production by 1 to 2 percent annually and up to 40 percent by 2050, achieved through divestments and natural attrition [10]. During this energy transition journey, Shell companies are aiming to maintain cash flow from traditional oil and gas operations,

while concurrently boosting investments in new energy sectors due to investment constraints and corporate strategy adjustments. This shift results in reduced expenditures for upstream exploration and development.

ExxonMobil continues to view oil and gas as its primary focus for the foreseeable future, allocating relatively modest resources to the energy transition and only limited investments in carbon capture technologies. Additionally, it deferred major production initiatives in the Permian Basin, located in the southern United States, as well as the Rovuma Basin in northern Mozambique. These actions are part of its commitment to exercising stringent expenditure control measures [11].

Therefore, for ExxonMobil, given the high asset beta, it should be particularly concerned about the risk of market volatility. This may include stricter risk management and hedging strategies to reduce the adverse impact of market volatility on the company. In addition, the company may need to optimize its portfolio to ensure risk diversification. As a high asset beta can lead to a higher cost of capital, it may need to carefully manage its debt financing to reduce financial risk and debt costs. Shell, for its part, may have a competitive advantage in the market due to its lower asset beta, as its relatively stable capital structure can help reduce the cost of capital for investment projects. Despite the low asset beta, Shell should continue to maintain financial soundness, ensuring adequate liquidity and debt management to respond to changing market conditions (see Table 3).

3 Conclusion

The financial characteristics of ExxonMobil and Shell are clearly different, which directly affects their risk strategies. Among the three important indicators selected (leverage, WACC, asset beta), the data results vary widely. Shell's leverage is about four to five times that of ExxonMobil. Exxon's WACC is about 4% larger than Shell's. The asset beta of ExxonMobil has 1.01, and the asset beta of Shell is only 0.49, if the market benchmark is 1.0, the difference is very big. In conclusion, comparing ExxonMobil and Shell, ExxonMobil exhibits higher leverage, a higher WACC, and a higher Asset Beta, indicating a more leveraged and risk-sensitive financial profile. Shell, on the other hand, displays lower leverage, a lower WACC, and a lower Asset Beta, suggesting a more balanced and potentially competitive financial position. These differences in financial characteristics reflect distinct strategies, risk appetites, and market sensitivities for the two companies. Each approach has its advantages and potential trade-offs, demonstrating the importance of aligning financial structures with strategic objectives.

The analysis of ExxonMobil and Shell's leverage, WACC, and Asset Beta has provided valuable insights into their financial profiles. It has filled gaps in understanding their capital structures and risk exposure. ExxonMobil's conservative approach with higher leverage and WACC aims to mitigate risk. In contrast, Shell's lower leverage and WACC provide a potential competitive edge in pursuing investments. These findings help investors and management make more informed decisions, aligning financial strategies with risk tolerance and market dynamics for optimal outcomes. This

study has shed light on the financial disparities between ExxonMobil and Royal Dutch Shell, offering insights for future research. To enhance this analysis, future studies could incorporate additional financial metrics and consider industry-specific factors. Additionally, a deeper exploration of the impact of leverage, WACC, and Asset Beta on strategic decision-making and performance outcomes could provide a more comprehensive understanding of their implications in the energy sector.

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