MARMORE
MENA INTELLIGENCE
A المركز MARKAZ Subsidiary

Methodology & Assumptions Adopted for the Valuation
P 22

Equity Value of Aramco (Upstream plus Downstream plus other assets)
P 43

November 2019

Saudi Aramco Valuation

Research Highlights:

A Case of abundant oil reserves, low extraction cost of oil compared globally, and strong profitability ratios but partially offset by high royalty, and income taxes and sensitive location in a region with political volatility

About Marmore

Organizational Background

Marmore MENA Intelligence provides research-based consulting solutions to help understand current market conditions, identify growth opportunities, assess supply/demand dynamics, and make informed business decisions.

Marmore is a fully-owned research subsidiary of Kuwait Financial Center 'Markaz'. Since 2006, Markaz Research has been at the forefront in disseminating thought-provoking, hard-data backed research reports. Marmore continues that legacy with a focused approach to providing actionable solutions for business leaders and policymakers.

Since its inception, Marmore has published over 700 research reports and covered more than 25 varied industries and infrastructure segments; all focused primarily on the GCC economies. (To view our Research Library, please *click here*)

With over 30 policy and regulatory research studies published, Marmore has partnered with renowned regional think-tanks and opinion-leaders to publish some of these intellectually provoking policy research papers. These research studies aim to initiate dialogue and propose better solutions to existing economic conundrums. (To view our Policy & Regulatory research report, *click here*)

Almost on a weekly basis, Marmore publishes thematic economic, industry, policy and capital market reports. Marmore has been recently conferred **"Research Provider of the Year - 2018" award by Global Investor, a Euromoney Group company.** To learn more, visit www.marmoremena.com

Experience/Qualifications

Marmore is the only regional firm providing niche research based on strong analytics in areas that are less researched. Marmore provides full range of financial market, sector specific and economic and policy researches, as well. The different types of researches are availed based on the client's requirements. It is notable that Marmore research reports have regularly been used by various renowned institutions to better understand the MENA region.

Marmore's strengths can be summarized as follows:

» Consistent track record of quality, in-depth research offerings;

» Skilled team with extensive experience in advanced quantitative and qualitative analysis techniques;

» Deep understanding of MENA market and access to wide-ranging database

» Delivers high quality, client specific, insightful research reports; highlighting key client issues and uncovering key answers/opportunities for the clients.

www.marmoremena.com
enquiry@e-marmore.com
/marmoremena
marmore-mena
@marmoremena
marmoreMENA

RESEARCH PROVIDER OF THE YEAR 2018 GLOBAL INVESTOR (EUROMONEY)

KNOWLEDGE PARTNER SWFI

Table of Contents

List of Tables

List of Figures

Qualifications to the Valuation Estimate

1. The Income and Expenses projections used in this valuation of Saudi Aramco are done on inflation adjusted basis. They are not done product-wise or plant-wise as the required data is not available and hence are carried out for groups of products namely Upstream Products and Downstream Products. Further, they are based on the basis of estimated production quantities, sales prices, production costs, gross margins, investment requirements, and working capital requirements derived directly or through approximations from the data available from the Company's financial statements for 2018 and information provided in the previous Bond Prospectus issued by the Company in early 2019.
2. For forecasting crude oil revenues, we based them on historical cyclical crude oil prices (adjusted for inflation) for Saudi Arabian crude sales and assumed the historical cycle of crude oil prices to be repeated in the future. There is no guarantee that crude oil cycle will be repeated in the future. The long-term inflation rate is not known and therefore it is based on IMF World Economic Outlook (WEO) data up to 2023 and expected to remain at those levels thereafter.
3. The Company's financials were available for only two years thereby limiting the scope for detailed analysis for identification of trends in revenues and costs. The results of first 9 months of 2019 and the announcements made by the Company regarding its Capex Plans are not considered in this valuation as the full details for the year are not available, the higher output level with higher Capex are not known and Company has stated the Capex plan depends on the Oil Prices that will be attained in the future
4. No discussion with the Company has been undertaken nor are we aware of the Company's Business Plan and strategy for the future which if known can have an impact on the valuation. The projections however take into some guidance provided in the bond prospectus.
5. The Cost of Equity is worked out based on data of Equity Risk Premiums in GCC, thirty-year US government bond yields, betas of some oil companies listed on New York Stock Exchange and adding an estimated Country Risk premium.
6. The 30-year US Government Bond Yield is taken for the valuation, as the Valuation estimated is carried out assuming a long-term investment. If the US 10-year government bond yield is taken the results can be different. On the other hand US inflation of 1.55% per annum is considered and the oil prices are expected to grow at this inflation to compensate for the loss in purchasing power of the US Dollar consequent to inflation, if this does not happen the Valuation result will be different.
7. No assessment of the prospects for company's joint venture investments and the value of these investments is taken at their book value.
8. The company invested in a controlling stake in SABIC in 2019. Since the stake was acquired at market value and it was done recently, no change in the SABIC stake is expected. That is from a valuation standpoint the difference between Assets (SABIC share stake value) and Liabilities (Borrowings undertaken and deferred payments due to Public Investment Fund from whom the stake was bought) will be zero. Hence SABIC Stake is not included in the valuation and even if it is included there will be offsetting assets and liabilities. Thus, the SABIC stake acquisition is therefore assumed to be valuation neutral.

Chapter 1

Executive Summary

Saudi Aramco (Aramco) the largest oil producer in the world, accounting for more than 10% of world oil production, has Upstream and Downstream activities with the former accounting for bulk of the profits generated. Upstream division has high gross margins of about 77% compared to 5.8% for the Downstream Division. Upstream activities comprise both crude oil as well as natural gas and its associated products, though much of the production comes from crude oil. Aramco supplies its oil partly to meet the consumption needs of the domestic economy, but main revenues are from exports. It supplies to the domestic economy that are at subsidized rates are compensated by the government for the subsidies provided through price equalization mechanism. Aramco has one of the lowest oil production cost among all the countries due to advantageous geological formation of oil reserves.

Aramco is expected to issue an IPO anytime soon. Media is abuzz with different opinions on Aramco's valuation, which is expectedly to range between USD 1.5 trillion and USD 2.0 trillion. Marmore in its attempt to value Aramco has used Discounted Free Cash Flows (DFCF) method, which is explained and presented in this report. Valuation comparison based on peer multiples is also discussed.

The Company's value is expected to be mainly contributed by the Upstream Division as it accounts for bulk of the Company's profits and value. The Company also processes about 30% of its oil in its downstream division to produce refined petroleum products and downstream chemical products and this division accounts for most of the remaining profits and value of the Company. However, the downstream division is of great strategic importance for the company as it provides a stable and easily accessible demand for its oil or upstream production. Aramco is moving in the direction of increasing its capacity for downstream products directly and indirectly in order to sustain stable demand for its oil and benefit from the higher value added that downstream activities provide. The Company is targeting at equity stakes in downstream producers in India and in China as part of this strategy.

The company's accounts for 2018 provide a combined picture for the Company with some disclosures as to the segment wise numbers. Based on these numbers, separation of the income and cost between the two segments namely Upstream and Downstream segment has been made assuming market prices and other assumptions related to the segmental transfers. Oil Prices are cyclic, and the cycle extends over a long period, which is the reason behind selecting a ten -year explicit projection for the valuation. Prices forecast exist for short term, but long view price expectations are uncertain. The valuation in the report relies on repetition of the oil cycle across the future period. Oil being central to economic growth its demand is expected to remain stable and growing though at low rates, in the future.

Its low cost of production compared to global producers which gives high margins and profits, results in an attractive valuation for the Company. The current low cost of equity and the risk-free rate being currently very low, provides an advantageous proposition for investors considering investing in the company's shares. The low cost of equity as well as the low cost of debt of the company gives an upward bias to the Company's market value in the DCF valuation presented in the report. The implicit valuation ratios for Aramco based on this valuation compare well with the ratios for other Oil Majors such as Exxon Mobil, British Petroleum, Royal Dutch, Chevron and Total, considering the much higher size of proven oil reserves for Aramco as well as its much higher Return on Equity (ROE), compared to these international peers. The Valuation result presented in the report shows that the net value available to shareholders from the Company's proven reserves at about USD 6.09 per barrel in present value terms is attractive and moderate as well. The report discusses and provides various upside and downside scenarios for the Valuation, in addition to valuation outcomes in case of extreme changes in some factors.

All in all, Aramco maybe poised for an attractive valuation and IPO if the potential investors can be convinced of the inherent comparative merits of its business, are undeterred by cyclic variations and have deep pockets to invest in it as a long-term play.

Chapter 2

Introduction

Saudi Aramco is the world's single largest oil producer accounting for more than 10 percent of the global oil production. The company is in existence for several decades. As part of the Saudi government's initiative to privatize State owned enterprises (SOE) and with a view to generate resources for other strategic investments being planned by the government an IPO of the company's shares is contemplated. As a precursor to the IPO, in the first half of 2019 the company raised international bonds in connection with which it disclosed the company's financials for the first time and issued a Bond Prospectus that detailed its operational information to the international community of investors. The news of the IPO has been in the media since almost two years, with several reports mentioning valuation estimates for the firm in the range of USD 1.5 trillion to USD 2.0 trillion. The IPO is now close to reality and is reported that it may happen in November of this year. This report assesses the market valuation of the Company based on Discounted Free Cash Flow (DFCF) methodology, using high level financial, physical and operational data that could be derived, approximated or estimated from the Company's Bond prospectus and 2018 financial accounts. To supplement these data, some information required for the valuation was also obtained through desk research and partly by application of analysis and inputs from experience.

For the purpose of the valuation, the Company's business activities were assessed under two main categories namely Upstream Activities (mainly oil and natural gas exploration activities) and Downstream Activities (mainly petroleum refining and chemical production activities). The downstream activities are carried out through various subsidiaries. The Downstream units purchase bulk of their oil requirements from oil and gas produced by the Upstream Activity. The information disclosed by the Company is also under these two categories. In addition, the Company has joint venture investments, financial securities and cash & bank deposits which add to the value of the company. The changes if any in these assets are not projected and are assumed to remain at the current levels. Also, company's acquisition of SABIC is not included, as it is assumed to be valuation neutral since the company was recent and was at market prices and gains or losses will not occur immediately. SABIC may add some synergies to Aramco, but this requires more information and analysis.

Chapter 3

Background Information about Saudi Aramco

Founded in 1933, Saudi Aramco, officially the Saudi Arabian Oil Company, is a Saudi Arabian national petroleum and natural gas company based in Dhahran, Saudi Arabia. The Company is the world's largest integrated oil and gas company. The Company's crude oil production accounted for approximately one in every eight barrels of crude oil produced globally from 2016 to 2018. As at 31 December 2017, the Company's proved liquids reserves were more than five times the combined proved liquids reserve of the five major IOCs (BP, reserve ExxonMobil, Royal Dutch Shell, Total SA).

Saudi Aramco is headquartered in Dhahran, but its operations span the globe and include exploration, production, refining, chemicals, distribution and marketing. All these activities of the company are monitored by the Saudi Arabian Ministry of Petroleum and Mineral Resources together with the Supreme Council for Petroleum and Minerals.

Saudi Aramco is organized into business units based on the main types of activities. At December 31, 2018, Saudi Aramco had two reportable segments, Upstream and Downstream, with all other supporting functions aggregated into a corporate segment. Upstream activities include crude oil, natural gas and natural gas liquids exploration, field development and production. Downstream activities include the refining, logistics, power generation, and the marketing of crude oil, petroleum and petrochemical products and related services to international and domestic customers. Corporate activities include primarily supporting services including Human Resources, Finance and IT not allocated to Upstream and Downstream.

Saudi Aramco's Upstream Segment

The upstream segment's activities consist of exploring for, developing and producing crude oil, condensate, natural gas and NGLs. Pursuant to the Concession, the Company has exclusive access to all hydrocarbons within the Kingdom. The following table sets forth the Company's estimates of its proved reserves as at 31 December 2017 and 2018:

Table 3.1: Company's proven reserves

As at 31 December 2018	2017	2018
Proved crude oil and condensate reserves (billion barrels)	204.8	201.4
Proved NGL reserves (billion barrels)	26.0	25.4
Proved Natural Gas reserves (trillion std cubic feet)	181.0	185.7

Source: Company bond prospectus

In 2018, the Company produced 13.6 million barrels per day of oil equivalent, including 10.3 million barrels per day of crude oil (including blended condensate), an additional 0.2 million barrels per day of unblended condensate, 1.1 million barrels per day of NGLs, 8.9 billion standard cubic feet per day of natural gas and 1.0 billion standard cubic feet per day of ethane. The Company's downstream business is the largest customer for the upstream business' crude oil production, consuming 38% of its crude oil production in 2018. The following table highlights the Company's upstream production and deliveries in 2016, 2017 and 2018:

Table 3.2: Upstream Production Information

	2016	2017	2018
Crude oil (mbpd)	10.561	10.080	10.315
Condensate (mbpd)	0.228	0.216	0.218
Natural gasoline (mbpd)	0.182	0.194	0.203
Butane (mbpd)	0.313	0.314	0.328
Propane (mbpd)	0.541	0.521	0.565
Total liquids (mbpd)	**11.825**	**11.325**	**11.629**
Natural gas (mmscfd)	8.280	8.733	8.856
Ethane (mmscfd)	0.920	0.936	0.993
Total (mmscfd)	**9.200**	**9.669**	**9.849**
Combined (mboed)*	**13.634**	**13.223**	**13.567**

Source: Company bond prospectus

****Combined barrel of oil equivalent volume (mboed) is derived from mmscfd (for natural gas and ethane) by dividing the relevant product production by 5.400 (in the case of natural gas) and 3.330 (in the case of ethane).***

Saudi Aramco's Downstream Segment

The Company has a large, strategically integrated global downstream business. The downstream segment's activities consist primarily of refining and petrochemical manufacturing and supply, power generation, trading and marketing operations. The downstream segment's other business activities include crude oil sales, product distribution, trading and marketing and power generation. As at 31 December 2018, the Company had a gross refining capacity of 4.9 million barrels per day and net refining capacity of 3.1 million barrels per day.

Table 3.3: Capacity of Downstream Segment

As at 31 December 2018	Capacity (mbpd)
In-Kingdom wholly owned	0.930
In-Kingdom joint ventures and joint operations	1.905
International	2.029
Gross refining capacity	**4.864**

Source: Company Bond Prospectus (Gross refining capacity is the total combined refining capacity of the Company and the joint ventures and other entities in which the Company owns an equity interest. Net capacity is the capacity of the Company, including the capacity of its joint ventures and other entities, multiplied by the Company's equity interest in the relevant joint venture or entity.)

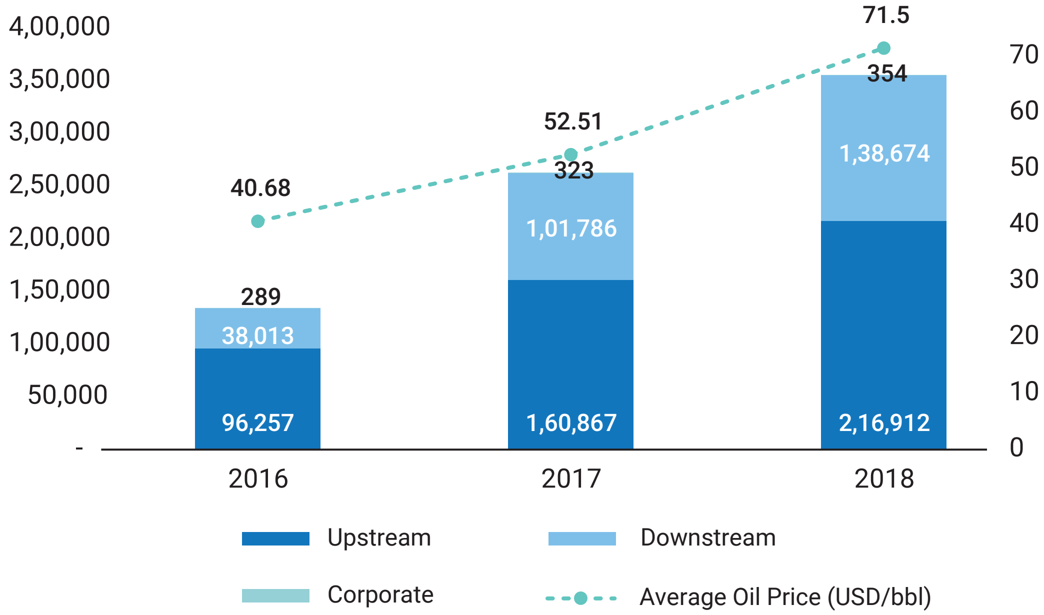
The Company expects the Jazan integrated petrochemical refinery and the PRefChem integrated refinery and petrochemicals complex to commence operations by the end of 2019, which will increase the Company's gross refining capacity to 5.6 million barrels per day and net refining capacity to 3.7 million barrels per day. The Company also has an integrated petrochemicals business within its downstream segment, which enables it to capture incremental margin in the hydrocarbon value chain. The downstream segment's other business activities include crude oil sales, product distribution and power supply.

Saudi Aramco's Corporate Segment

The Company's corporate segment primarily supports the activities of its upstream and downstream segments. The corporate segment includes technical services that are essential for the Company's core activities, including human resources, finance, corporate affairs and legal.

Revenue Streams

Figure 3.1: Saudi Aramco 2018 Segment Revenue (USD Million)

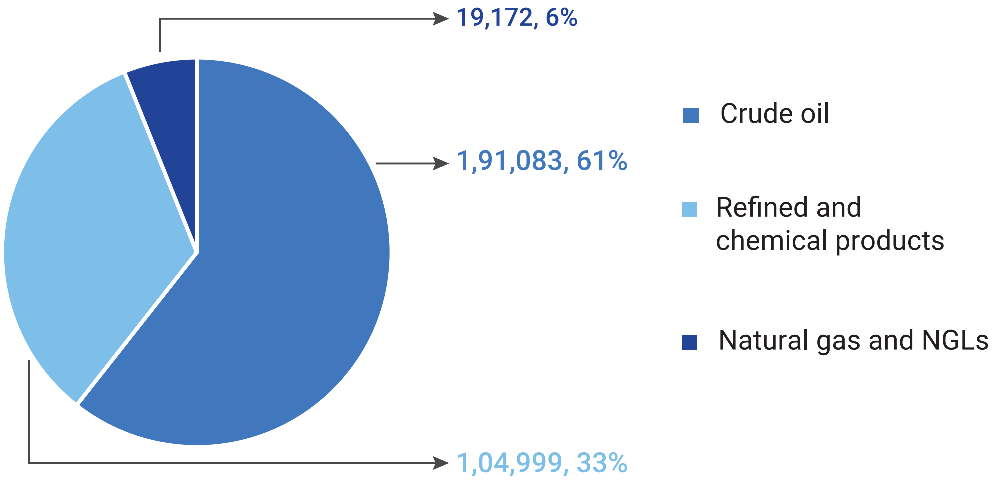


Source: 2018 Annual Report

Saudi Aramco Company's Revenues and Financial Position

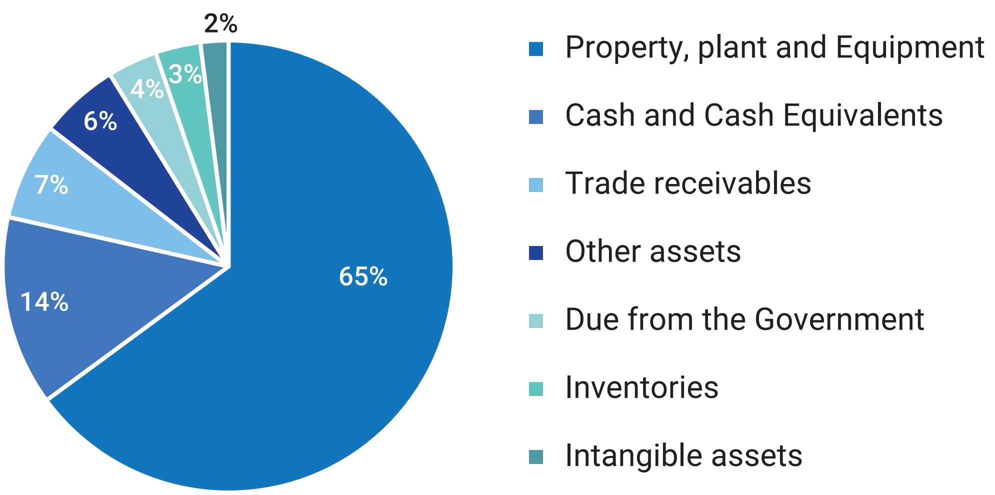
In 2018, overall revenues for Saudi Aramco stood at USD 356 billion. The majority of the Company's revenues have historically been derived from its upstream segment, and currently accounting for over 66% of the total revenue. The company revenues are highly dependent on oil prices as can be seen by a revenue of USD 135 billion in 2016 (Average oil price USD 45/bbl) to USD 356 billion in 2018 (Average oil price USD 71.5/bbl). Crude oil accounts for the majority of the upstream segment revenue generation with USD 191 billion in revenue registered in Dec 2018.

Figure 3.2: Saudi Aramco 2018 Revenue split (USD Million)



Source: 2018 Annual Report

Figure 3.3: Assets of Saudi Aramco (2018)



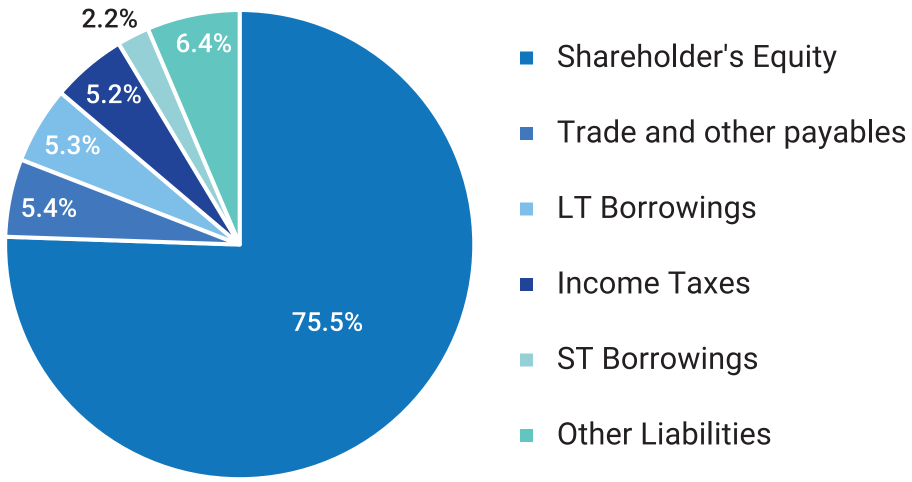
Source: 2018 Annual Report

The overall assets of the company stand at USD 359 billion. Fixed assets make up the majority of the assets amounting to USD 233 billion. Cash and cash equivalent are a significant proportion of the assets at USD 49 billion amounting to 14% of total assets. Other major assets include trade receivables at USD 25 billion and inventories at USD 11.6 billion. Intangible assets consist primarily of exploration and evaluation costs, brands and trademarks, franchise/customer relationships, computer software and patents and intellectual property making 2% of the total assets.

Liabilities

Aramco is majorly funded by shareholder's equity amounting for 75.5% of total liabilities. The total borrowings of the company are minimal with just USD 19 billion (5.3%) in long term borrowings. As the company is subjected to pay 50% of its share of the income to the Saudi government in the form of taxes, income tax payable constitutes a large portion of the current liabilities at USD 18.5 billion (5.2%).

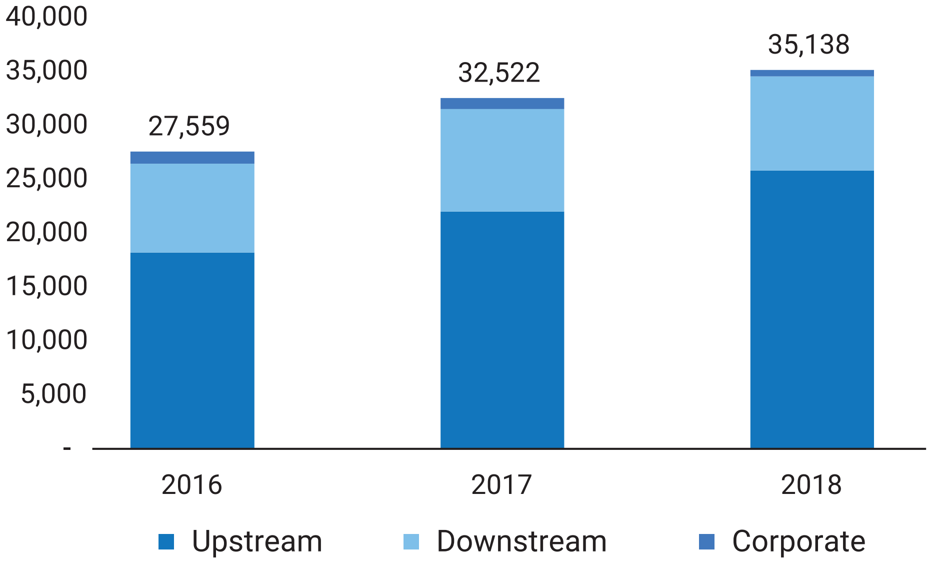
Figure 3.4: Total Liabilities of Saudi Aramco (2018)



Source: 2018 Annual Report

Saudi Aramco's Historical Capital Expenditure (Capex)

Figure 3.5: Saudi Aramco Capital Expenditure (USD Million)



Source: 2018 Annual Report

The Company's capital expenditures were USD 35.1 billion for the year ended 31 December 2018, with most of the expenditure contributing to the upstream segment. The capex in year ended 2018 has seen an increase of 8% from USD 32.5 billion for the year ended 31 December 2017, and 27.5% from USD 27.6 billion for the year ended 2016. The increase in capex is due to the expansion of the Haradh gas facilities and the construction of the Fadhili gas plant to meet growing domestic demand for natural gas and fund the ongoing capital projects at Jazan, and upstream development projects to increase crude oil production at Khurais. The Capex is estimated lower in 2019 for the Valuation as Capex of about USD 8 billion incurred for expansion of downstream plants in 2018 is not assumed to be repeated in 2019 onwards, based on the plant capacities assumed in the projection.

Company's Investments in joint ventures and associates

Table 3.4: Joint Ventures and Associate Holdings (USD million)

Company	Equity Ownership (2018/2017)	Principal place of business	Nature of activities	Carrying amount at 12/31/2018	Carrying amount at 12/31/2017
Sadara Chemical Company	65%	Saudi Arabia	Petrochemical	3,109	3,128
Arlanxeo Holding B.V	Nil / 50%	Netherlands	Synthetic rubber	-	1,445
Rabigh Refining and Petrochemical Company	37.50%	Saudi Arabia	Refining/ petrochemical	737	673
Fujian Refining and Petrochemical Company Limited	25%	China	Refining/ petrochemical	645	661
National Shipping Company of Saudi Arabia	20%	Saudi Arabia	Global logistics services	568	565
Jubail and Yanbu Electricity and Water Utility Company	24.80%	Saudi Arabia	Utilities	488	450

Company	Equity Ownership (2018/2017)	Principal place of business	Nature of activities	Carrying amount at 12/31/2018	Carrying amount at 12/31/2017
International Maritime Industries	50.10%	Saudi Arabia	Maritime	113	39
Sinopec SenMei (Fujian) Petroleum Company Limited	22.50%	China	Marketing/ petrochemical	107	126
Juniper Ventures of Texas LLP	60% / Nil	United States	Marketing	88	-
First Coast Energy LLP	50%	United States	Marketing	70	79
S-Oil TOTAL Lubricants Limited	50%	South Korea	Lubricants production/sale	39	42
Saudi Arabian Industrial Investment Company	25%	Saudi Arabia	Investment	31	39
GCC Electrical Equipment Testing Lab	20%	Saudi Arabia	Inspection	17	18
Star Enterprises LLC	50%	United States	Pension Administration	7	9
Pan Arabian Program Management Company	50% / Nil	Saudi Arabia	Engineering services	1	-
				6,021	**7,273**

Source: Company Annual Report

Production Royalties Payable by Aramco

Royalties to the Government are calculated based on a progressive scheme applied to crude oil and condensate production. An effective royalty rate is applied to production based on the Company's official selling prices. All such royalties are accounted for as an expense in the Consolidated Statement of Income and are deductible costs for Government income tax calculations.

Table 3.5: Royalty Rates Currently Applicable to Saudi Aramco

	effective royalty rate %
baseline marginal rate for oil price upto USD 70/bbl	15%
oil price between 70/bbl and 100/bbl	45%
oil price above 100/bbl	80%

Source: Saudi Aramco website

In 2018, Aramco paid a total royalty of USD 55.6 billion when the total crude oil and condensate revenue was USD 191 billion, making the effective royalty rate approximately 30%. This shows that Aramco was able to sell a sizable portion of their oil production at prices above USD 70/bbl.

Historical Saudi Aramco Financials

Table 3.6: Historical Income Statement

USD Million	2017	2018	YoY % change
Revenues	224,128	315,236	40.6%
Other income related to sales	40,047	40,704	1.6%
Total Revenue	264,175	355,940	34.7%
Cost of Revenue, Total	86,387	120,971	40.0%
Gross Profit	177,789	234,969	32.2%
Total Operating Expense	108,732	143,032	31.5%
Operating Income	155,444	212,908	37.0%
Net Income Before Taxes	155,050	212,772	37.2%
Provision for Income Taxes	79,152	101,701	28.5%
Effective Tax Rate	51%	48%	
Net Income After Taxes	75,898	111,071	46.3%

** Other income related to sales include supplemental income from government*

Source: Reuters

Table 3.7: Historical Balance Sheet

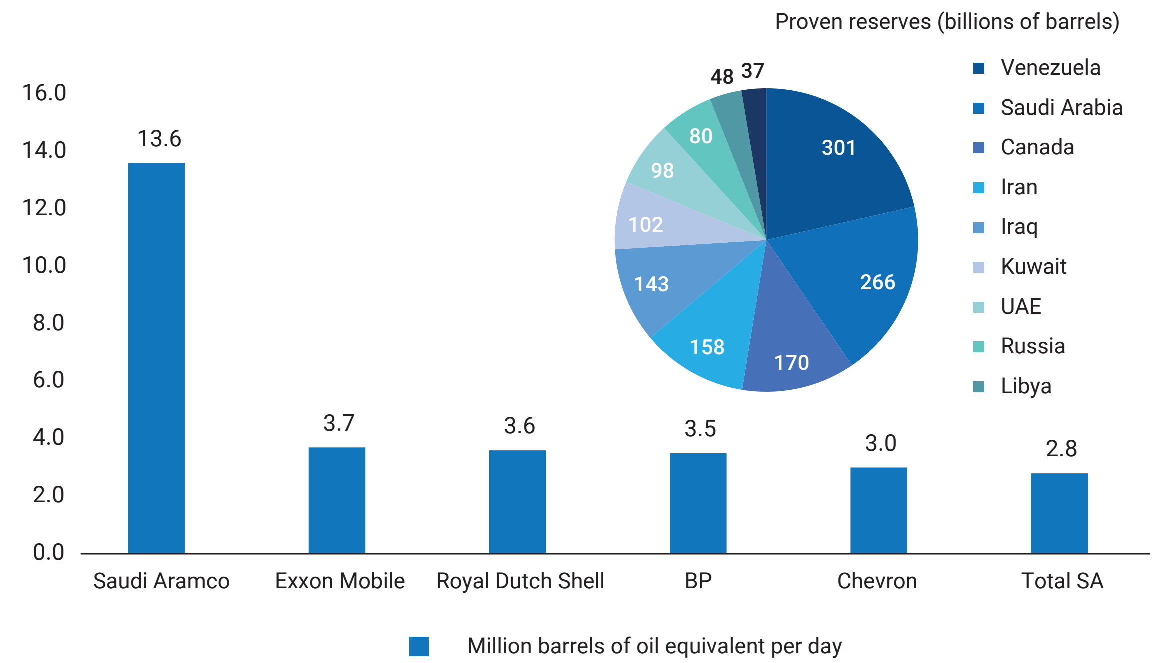
USD Million	2017	2018
Property, plant and Equipment	200,302	233,021
Intangible assets	6,492	7,172
Investments in Joint ventures and associates	7,273	6,021
Inventories	9,070	11,621
Trade receivables	23,171	25,018
Cash and Cash Equivalents	21,665	48,841
Total Assets	**294,014**	**358,978**
Shareholder's equity	217,002	271,142
Non-controlling interests	3,348	3,107
Total Equity	**220,350**	**274,249**
Borrowings	18,318	19,021
Trade and other payables	16,548	19,276
Royalties	5,443	3,164
Total Liabilities	**73,664**	**84,729**
Total Equity and liabilities	**294,014**	**358,978**

Source: Reuters, Marmore Analysis

Proven Reserves of Saudi Aramco – Comparison with Peers

Saudi Arabia has more crude oil reserves than any other country except Venezuela. With a monopoly over these reserves, Saudi Aramco dwarfs any of its publicly held western rivals.

Figure 3.6: Saudi Aramco is the largest oil producer in the world

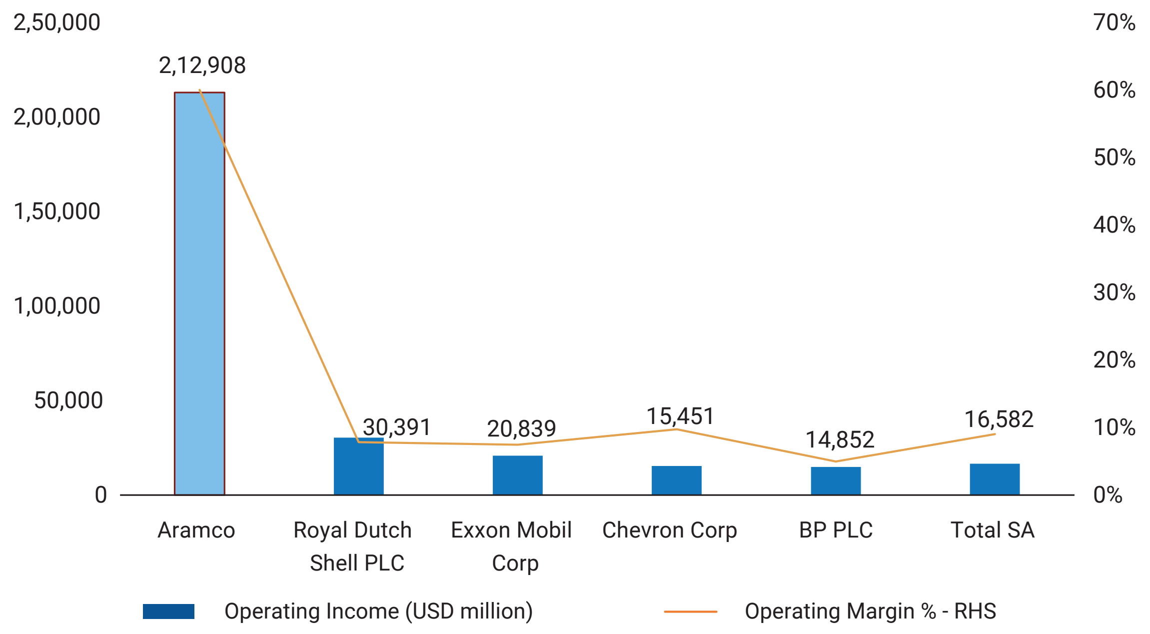


Source: Company annual report, Financial times, EIA

Comparison of Profit Margins – Saudi Aramco versus its Peers

Prior to tax as well as small interest payments, Aramco's profits are far higher when compared with its international oil company peers. Benefiting from the rise of oil prices to USD 71/bbl on average in 2018 compared to USD 57/bbl in 2017, Aramco reported an operating profit of USD 212.9 billion and a net profit of USD 111 billion in 2018. It has an EBIT margin of 60% and a Net income margin of 31%, which is far above that of its peers.

Figure 3.7: Profit Margin of Saudi Aramco far higher than its global competitors

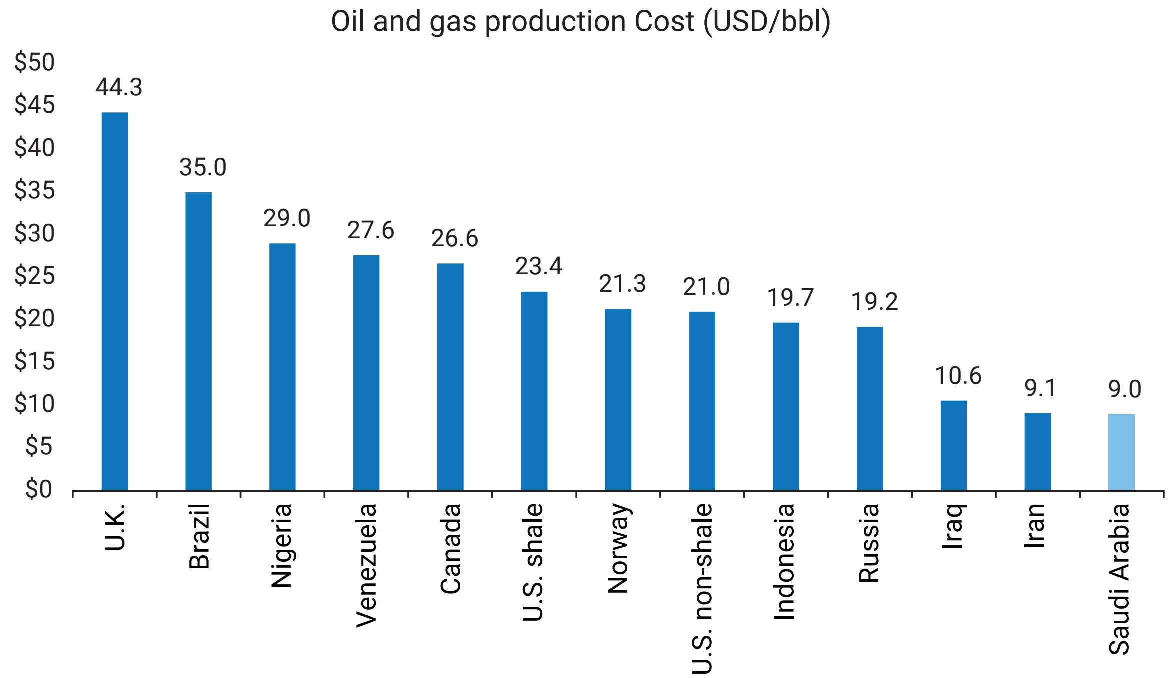


Source: Company 2018 annual reports, Reuters

Saudi Aramco's Production costs

Based on a comparison of production cost data of the five major IOCs and other leading oil and gas companies, the Company is uniquely positioned as the lowest cost producer globally as at 31 December 2017. The Company's average upstream lifting cost was SAR 10.6 ($2.8) per barrel of oil equivalent produced in 2018. In addition, the Company's upstream capital expenditures for the year ended 31 December 2018 is about USD 6.67 per barrel of oil equivalent produced. The Valuation is based on a Capex per barrel produced of USD 6.67, grown in the future years at the rate of inflation of US. The Company's low cost position is due to the unique nature of the Kingdom's geological formations, favorable onshore and shallow water offshore environments in which the Company's reservoirs are located, synergies available from the Company's use of its large infrastructure and logistics networks, its low depletion rate operational model and its scaled application of technology. Given the quality of most of the Company's reservoirs and its operational model, it is possible to achieve high recovery factors while maintaining relatively low water cut levels for long periods of time.

Figure 3.8: Saudi Aramco has some of the lowest cost of production in the world



Source: The Wall Street Journal, as of March 2016

Methodology & Assumptions Adopted for the Valuation

The DCF Valuation Methodology principally requires estimates of the free cash flows (FCF) that will be generated to perpetuity that are discounted with the Weighted Average Cost of Capital (WACC) and the value derived is adjusted for other financial assets and liabilities that are of a continuing nature. The free cash flow projections require a forecast of the Income Projections, Balance Sheet Projections and Investment requirements (Capital Investment and Working Investment). The WACC requires estimation of the Cost of Equity (Ke) and Cost of Debt (Kd), and the target or actual debt to equity ratio (DER). The DCF Valuation is carried out for the two business activities namely Upstream Activities and Downstream activities separately.

Methodology & Assumptions for Income Projections

The Income projections are based on forecast of Revenues and Costs. Crude oil is a cyclical commodity that exhibits ups and downs over long economic periods of about 10-12 years. Therefore, current crude oil prices cannot be relied upon as an indicator of the immediately approaching years ahead. Therefore, given this cyclicality the FCF projections are carried out over a long period, which in this case is done for a period of ten years (2019-2028).

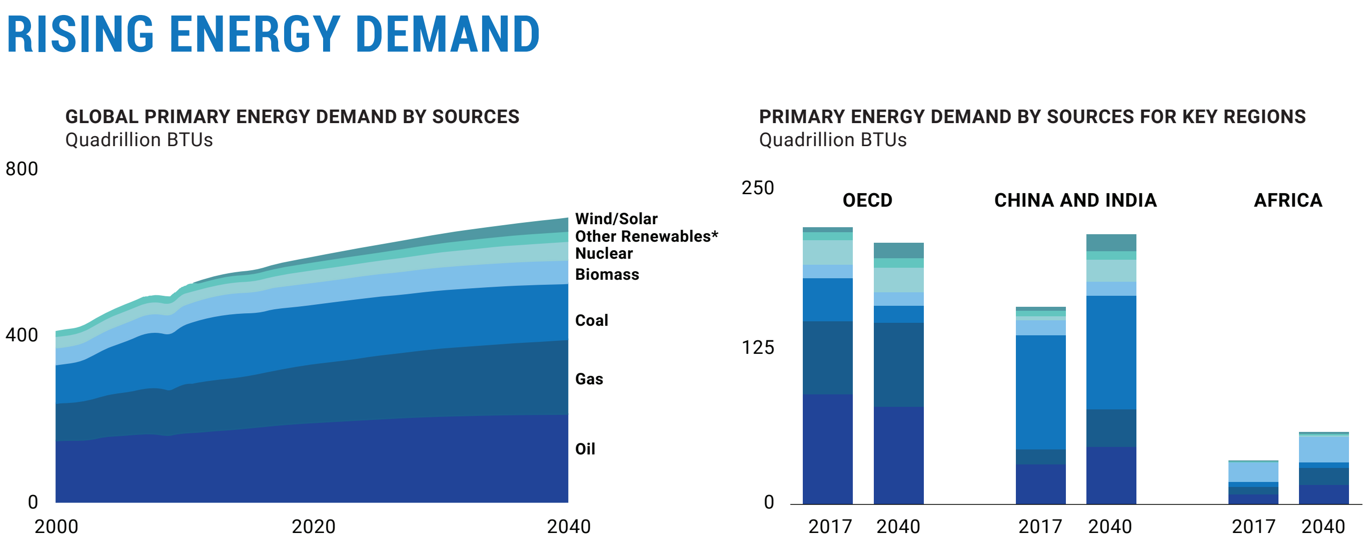
Methodology for Upstream Revenue & Cost Projections

The principal revenue drivers are the volume of crude sold, the crude oil price achieved, and the royalty paid. The first step in estimation of company's upstream revenues is therefore forecasting crude and allied products volumes expressed as a combined barrels per year of crude oil equivalent. The key drivers for oil revenues are the engines of economic growth like the power generation and transportation including road and air, economic advancement shown by the growth in aforesaid contributors as well as industrial production, passenger vehicle growth, industrial, commercial and consumer plastics, industrial chemicals, and core industries like steel, cement, aluminum. We have relied on growth estimates as provided by agencies like EIA for future oil demand which reflects steady demand and growth.

Thus, the demand for company's crude and allied products is done by first estimating the crude oil equivalent sales volume in 2018. The crude oil equivalent sales value (USD billion) gross of inter divisional transfers and average sales realization (USD per barrel) are derived from company information, using which the crude oil equivalent sales volume for 2018 was estimated. 2018 sales volume was next grown in future by an assumed growth rate of 1.7% per annum in line with global growth and its expectations. Nevertheless, it must be mentioned it is possible for Aramco to achieve higher growth and step up its market share since almost 60% of the Company's sales are generated from growth markets in Asia like China and India that have GDP growth in excess of 5% and it has large reserves many times that of other oil majors in the world. The company's resilience in getting back to normal production in short time after drone attacks on its facilities has introduced new risk factors but has also instilled greater confidence in its capabilities for restoration and maneuverability.

The world demand for oil is expected to show continued growth over the next several decades as world economies grow and new economies join the demand for more oil as they achieve economic advancement (see Figure 4.1 below)

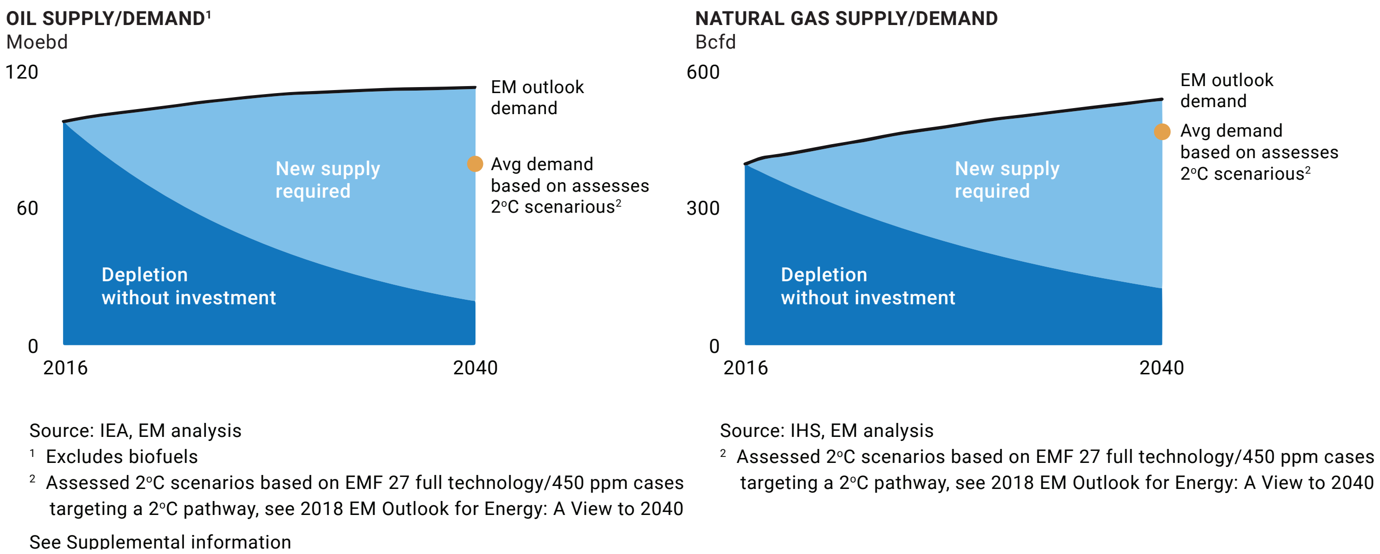
Figure 4.1: World Energy Demand by Fuel (Past and Future: 2000-2040)



Source: Exxon Mobil Investor Presentation (2019)

Aramco has oil reserves of 250 billion barrels that will be enough to feed sales for the next 60 years, thus capacity is not a constraint unlike some of the other international oil companies that are stated to have currently oil reserves that will last 10-15 years only. The shortfall in Global Oil Supply over the 20 years can be understood from Figure 10: Oil and Natural Gas Demand & Supply Gap (Exxon Mobile) given below:

Figure 4.2: Oil and Natural Gas Demand Supply Gap (2016-2040)

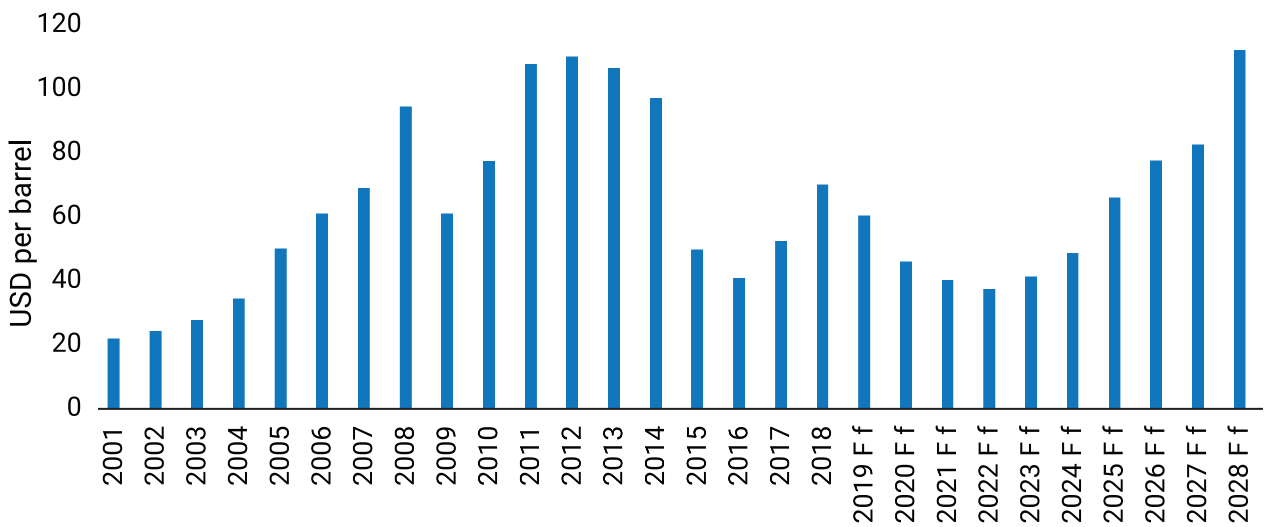


Source: Exxon Mobil Investor Presentation (2019)

The crude oil price driver is mainly the cyclical yearly average oil price and also the inflation rate in U.S. as it means weakening of the US Dollar due to inflation which is expected to be compensated by a price increase in oil to neutralize loss in purchasing price of US Dollar due to inflation. The next assumption is therefore that related to sales realization forecast for crude oil for next 10 years and beyond. This is assumed based on historical sales realization for Arab Light grade crude given in SAMA annual report up to 2017 and that for Aramco for 2018 from its bond prospectus. The historical prices are cyclical with peaks and troughs and that is assumed to be repeated in the same way into the future years for this valuation. The cyclical price forecast is taken after adjusting for inflationary impact by considering the USD inflation for the past i.e. up to 2018 available from IMF's World economic Outlook (WEO) and future inflation is considered at around 1.55% per annum. It may be mentioned that as per IMF Data the inflation for United States is forecast at around 2.2% up to 2023.

Please refer Figure 4.3: Crude Oil Price Historical and that assumed for future years.

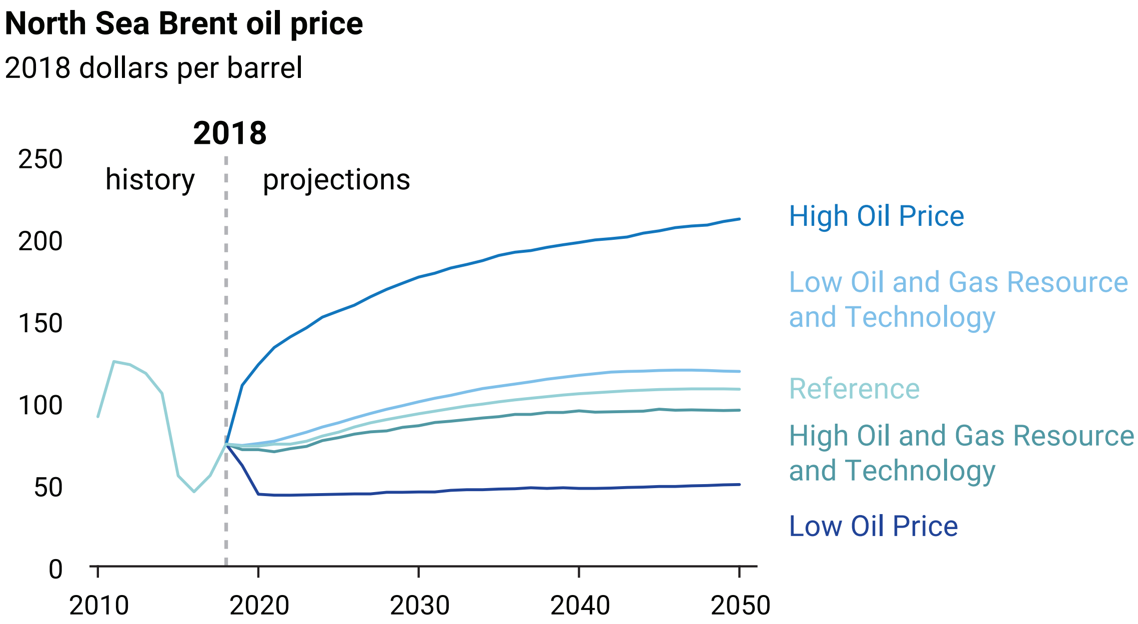
Figure 4.3: Crude Oil Prices Historical (2001-18) and Assumptions for Valuation (2019-28)



Source: SAMA Annual Report (up to 2017), Aramco (2018) and Marmore analysis(forecast)

While the valuation model assumes the crude oil price behavior to be as shown in Figure 4.3 above, the other likely scenarios for oil prices can be seen from Figure 4.4 which is extracted from the EIA prepared Energy Outlook 2019. The scenarios also consider impact of new resources and technologies. This forecast shows possibility of Reference case oil price above USD 100 per barrel in the long term and a low price of USD 50 per barrels and a high price of even as high as above USD 200 per barrel.

Figure 4.4: Alternative Estimates of Crude Oil Prices (2018-2050) by EIA



Source: Annual Energy Outlook 2019, EIA

Thus, with sales price and sales volume estimated in accordance with methodology explained in the previous paragraphs, the upstream revenues for the Company are forecast for the future years.

The main cost drivers are the Royalty rated charged by Saudi Government, and the Production cost of lifting oil. Therefore, next item estimated is the operating costs, that are principally the oil lifting cost (given as USD 2.82 per barrel in the Company's bond prospectus), which is applied on the sales volume to estimate the Cost of Production. Other Costs are regulatory costs like Royalty payable to government for which the applicable rate structure varies from 15% to 80% and is given in a document dated September 30, 2019 posted on the Company's website. The Selling, General and Administration (SGA) costs for 2018 are available for the Company and suitable assumption is made to estimate Upstream Activity's share of these costs and grown in the future years treating it as a semi variable cost partly and as a fixed costs which are increased using the inflation rates. The Depreciation cost for 2018 is available for the Company and the upstream activity share is estimated considering its share of the total gross fixed assets (see Figure 4.5 and Figure 4.6 below for operating costs expressed as USD per barrel). The company has the lowest production cost in the world, which is seen to be around USD 7-8 plus royalty of around USD 13.4 in 2018. On the other hand, Exxon Mobile in its recent oil discovery of 5.0 billion barrels in Guyana reported that oil price of USD 40 per barrel would give it 10% return implying a possible cost of production of USD 35 per barrel. However, part of the advantage for Saudi Aramco is offset by the higher income tax in Saudi Arabia compared to that of global rates.

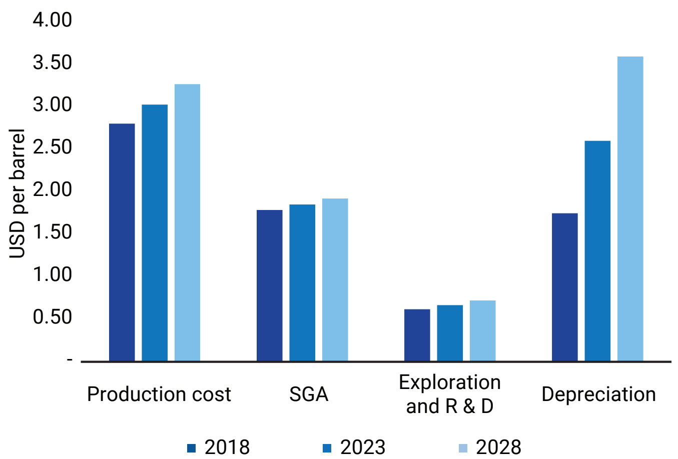
Table 4.1: Upstream Production and Unit Costs Forecast (2018-2028)

USD per barrel

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	(A)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Production Volume (mmbd)	11.50	11.69	11.89	12.10	12.30	12.51	12.72	12.94	13.16	13.38	13.61
Average Sales Realization	70.0	60.4	46.0	40.2	37.5	41.4	48.7	66.0	77.7	82.6	112.1
Royalty Cost	13.37	9.06	6.90	6.03	5.62	6.21	7.31	9.90	13.96	16.16	33.67
Production Cost	2.80	2.85	2.89	2.94	2.98	3.03	3.07	3.12	3.17	3.22	3.27
SGA Cost	1.79	1.80	1.81	1.83	1.84	1.85	1.87	1.88	1.89	1.91	1.92
Exploration and R & D	0.62	0.63	0.64	0.65	0.66	0.67	0.68	0.69	0.70	0.71	0.72
Depreciation cost	1.75	1.91	2.07	2.24	2.42	2.60	2.79	2.98	3.18	3.38	3.59

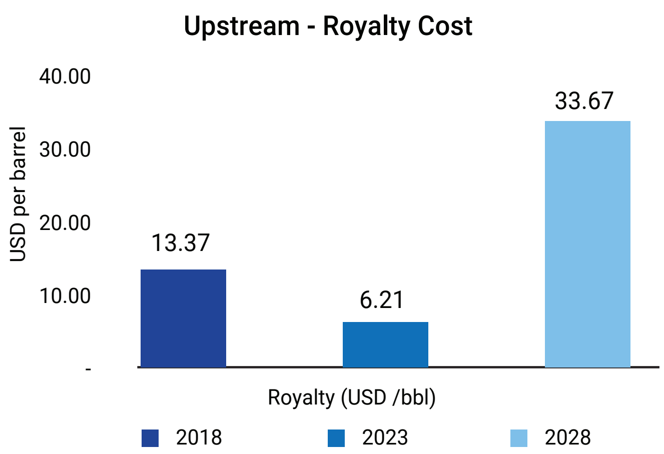
Source: Aramco Prospectus (AP), Marmore estimates and Analysis; (F): forecast, (A): Actual

Figure 4.5: Upstream Operating Costs (2018-28)



Source: Aramco Prospectus (AP), Marmore Analysis

Figure 4.6: Royalty Cost Change (2018-28)

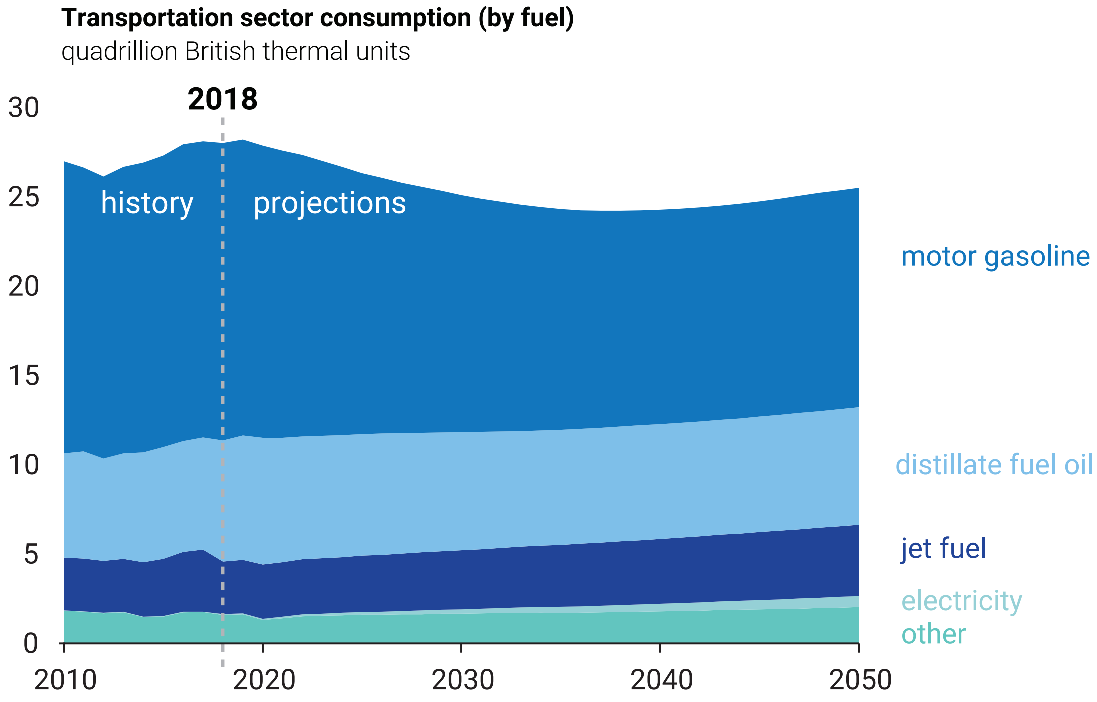


Source: Aramco Prospectus (AP), Marmore Analysis

Methodology for Downstream Revenue & Cost Projections

The revenues for the downstream sector are more stable compared to oil prices. Generally, though oil prices move up and down, the gross refining margin for petroleum refining or value added per barrel of oil for derivative chemicals processed (output value minus input price per barrel) is not expected to fluctuate in a large manner and hence average value is considered reasonable to assume. The demand growth for downstream products is considered based on forecasts, revenue growth of some of the downstream products is expected to continue showing growth while, others like gasoline consumption by transportation sector may see declining consumption with a reversal in later years. (see Figure 4.7: Transportation Sector Consumption by Fuel).

Figure 4.7: Global Motor Fuels Consumption Forecast up to 2050



Source: Annual Energy Outlook 2019, EIA

For the income projections, it is assumed that the value added per barrel of oil in the downstream activity will remain steady in real terms at the 2018 actuals of 9.08 USD per barrel for the company. The 2018 gross value added (GVA) is estimated by taking the Downstream revenues and subtracting from it the purchases and dividing by the estimated volume of downstream products in that year. The 2018 GVA is grown in the future years by the USD inflation rates. Using the downstream GVA estimate, the forecast of gross revenues per unit volume for this division is prepared by adding to it the estimated cost of materials (purchases) required based on the oil price assumed for that year. Both the GVA and revenue per unit volume are grown by the expected volume growth of the products in the future years.

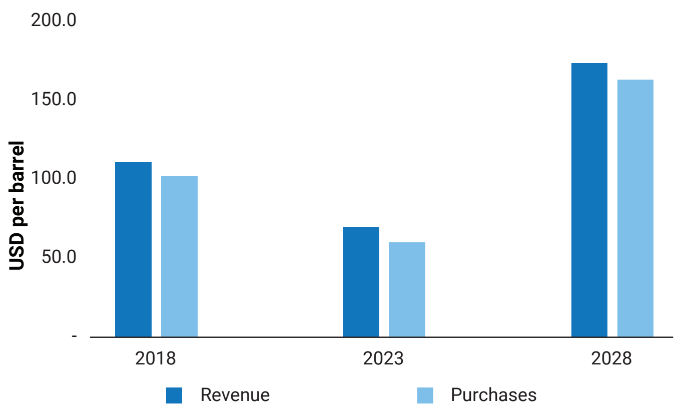
The production cost for downstream activity is based on its cost in 2018, grown in the future by the volume growth in those years. The SGA, and Depreciation cost estimates are based on methodology like that used for Upstream Activity. The numbers assumed for the Income projection are shown in Table 4.2 below.

Table 4.2: Downstream Production and Unit Cost Forecast (2018-2028)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	(A)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Production (mmbd)	3.43	3.87	4.02	4.18	4.34	4.50	4.66	4.74	4.82	4.90	4.98
Gross Valued added (bbl)	9.02	9.16	9.31	9.45	9.60	9.74	9.90	10.05	10.21	10.36	10.52
Production cost (USD/bbl)	2.58	2.62	2.66	2.70	2.74	2.78	2.82	2.87	2.91	2.96	3.00
SGA cost (USD/bbl)	0.67	0.64	0.64	0.63	0.63	0.63	0.63	0.64	0.64	0.65	0.66
Depreciation cost (USD/bbl)	2.93	2.60	2.52	2.45	2.38	2.32	2.26	2.25	2.23	2.22	2.21

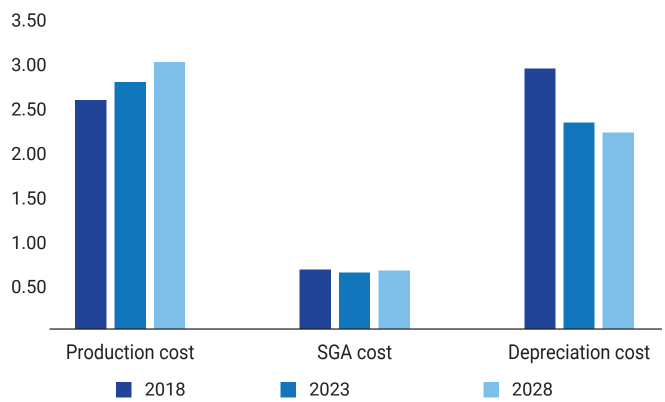
Source: Aramco Prospectus (AP), Marmore estimates and Analysis; (F): forecast, (A): Actual

Figure 4.8: Downstream Unit Revenue & Material Cost



Source: Aramco Prospectus (AP), Marmore Analysis

Figure 4.9: Downstream Unit Operating Costs



Source: Aramco Prospectus (AP), Marmore Analysis

Methodology & Assumptions for Investment Requirement Assessment (IRA)

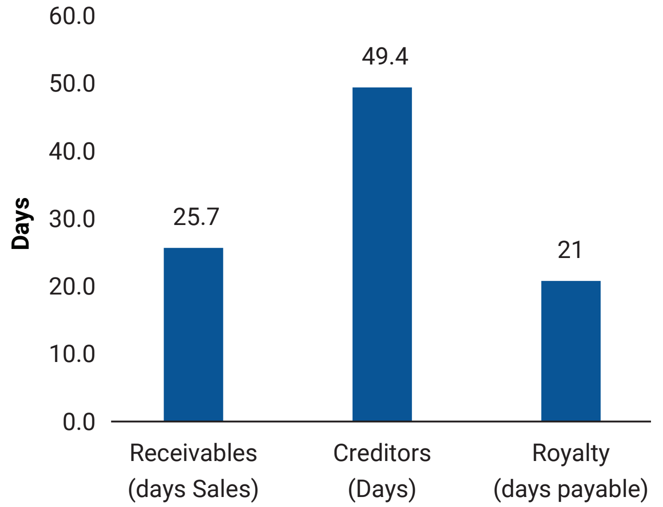
The investment requirement forecast is prepared separately for Upstream and Down Stream activities.

Methodology- Upstream Investment requirement

The capital expenditure incurred by the Upstream Activity is disclosed in the prospectus and production volume of upstream in 2018 has been estimated. The capex per barrel produced is USD 6.66. Using this information, the capital expenditure for future years is estimated by considering the production volumes expected for future years as well as increasing it for inflation in the US i.e. inflation rate applicable to USD Dollar.

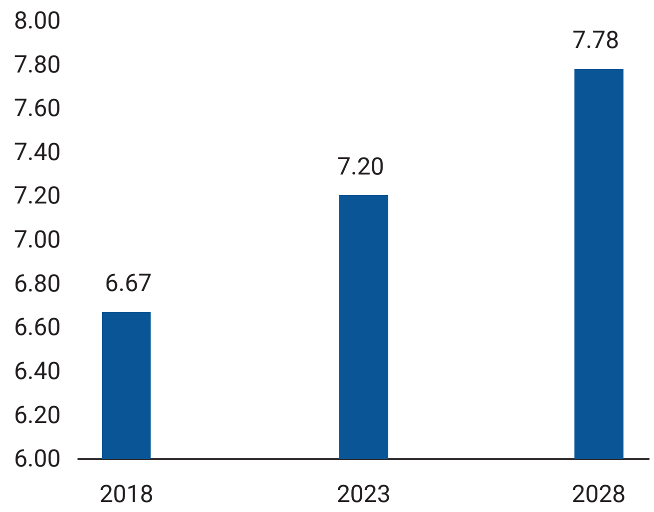
The inventory held by the Company in 2018 is distributed b/w the Upstream and Downstream activities based on the proportion of sales level. The inventory days of COGS are estimated using the inventory allocated to each of the two divisions. The working capital norms for receivables, and creditors applicable to the Company are derived from the amounts of these items held in the year 2018 and using these norms the Working Capital investment requirements for the upstream activity in the future years are estimated. Using the derived norms and applying them to the relevant drivers likes Revenues (for receivables), Cost of Goods Sold (for inventories) and Purchases (for Creditors) the current assets and liabilities are estimated. The dues towards government for Royalty payments in 2018 are grown in the future years using as driver the royalty payments to be made in the future years.

Figure 4.10: Upstream Working Capital Norms (days)



Source: Marmore Analysis

Figure 4.11: Upstream Capex per barrel (USD)



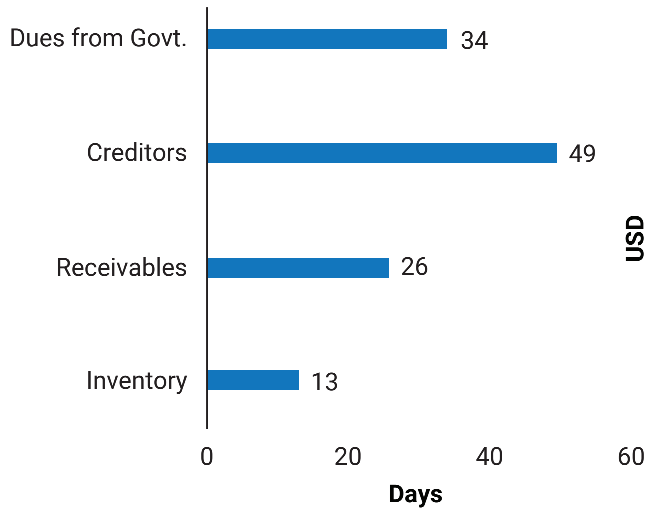
Source: Marmore Analysis

Methodology- Downstream Investment requirement

The capital expenditure incurred by the Downstream Activity is disclosed in the prospectus and production volume of Downstream in 2018 has been estimated. Like in the case of Upstream, using this information, the capital expenditure for future years is estimated.

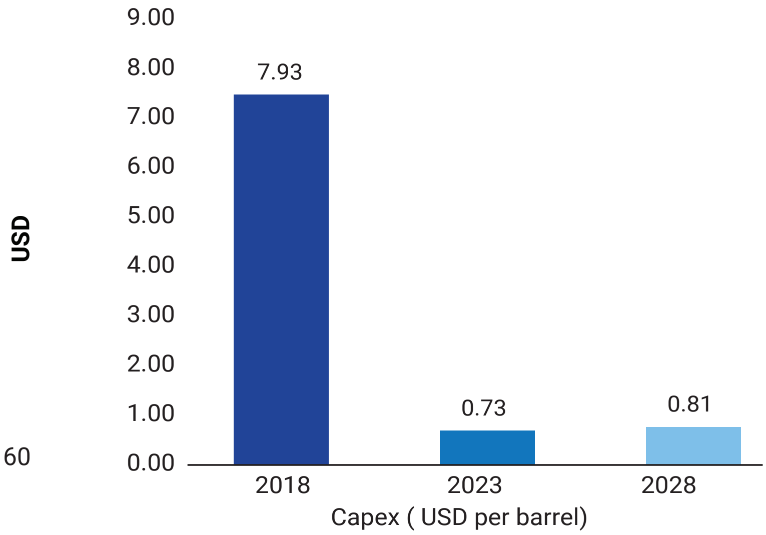
The working capital norms applicable to the Company available for the year 2018 are used, like in the case of Upstream, to estimate working capital requirements for the downstream activity. The unpaid dues from government towards other income (relating to compensation for subsidized fuel prices for supplies within the Kingdom) in 2018 are grown in the future years using revenues as the driver.

Figure 4.12: Downstream Working Capital Norms



Source: *Marmore Analysis*

Figure 4.13: Downstream Capex per barrel



Source: *Marmore Analysis*

Methodology & Assumptions for Determining WACC

The estimation of WACC requires an estimate of the cost of equity, cost of debt and the debt to equity ratio. In addition, we also require an estimate of the Country Risk Premium for Saudi Arabia. The debt to equity ratio is taken at an assumed targeted level of 10% debt and 90% equity (The Company has indicated in a document on its website that it will operate at a Target Debt to Equity Ratio in the range of 5% to 15%). The cost of debt is taken at 4% being the approximate yield currently on the company's bonds in the international market. The country risk premium is estimated at around 0.98% based on the sovereign rating for Saudi Arabia and using the methodology available for estimating country risk premiums from Professor Aswath Damodaran of NYSU, New York on his website.

For estimation of the cost of equity using Capital Asset Pricing Model (CAPM), one requires the Risk-free rate (Rf), the Equity Risk Premium (ERP) and the beta for the company's stock. The Risk-free rate is taken as 2.6% being the yield on 30 Year US Treasury Bonds. The beta for Aramco is taken as 0.94 being the weighted average 5-year beta of Exxon Mobil, Total, and British Petroleum, after un-levering by their respective debt to market value of equity ratios and re-levering for Aramco's target debt to equity ratio. The annualized monthly equity risk premium for Dow Jones Index for the period 1960-2019, varied with about 90% of the observations being below 4.88%, and this rate if assumed for calculating the Ke (using the equation Ke = Rf + ERP *Beta) for Aramco, the Ke for Aramco based on these indicators works out to 8.2%. (see Table 4.3 and Figure 4.14 for beta calculations and Equity Risk Premium). However, for this Valuation conservatively a higher cost of equity of 8.6% is assumed based on an Equity Risk Premium of 5.3% (instead of 4.88% mentioned earlier) based on ERP recommended in a Marmore's recent publication of ERPs for the GCC countries.

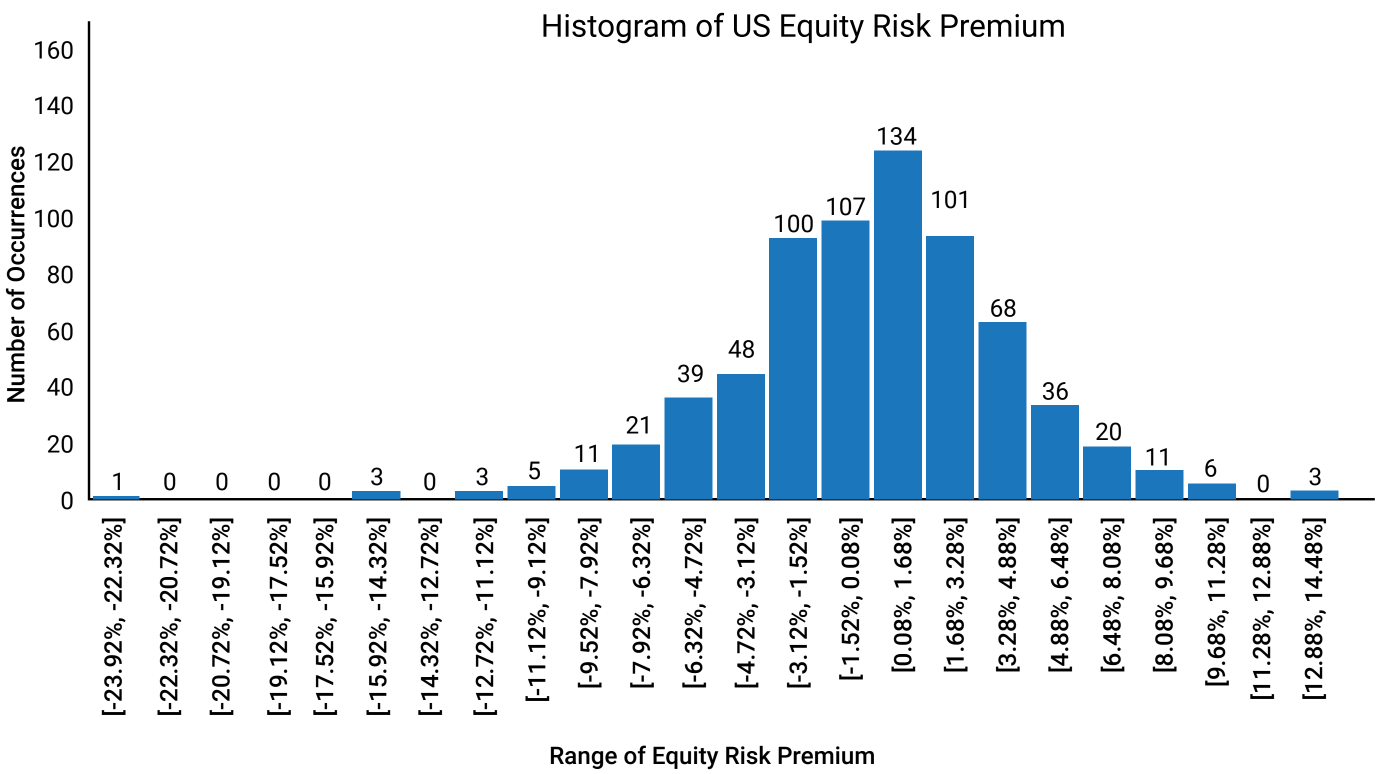
Table 4.3: Estimation Parameters for Aramco Beta

Stock Name	Market Cap	D/E	Beta (levered)	Beta (unlevered)
Exxon	292	0.13	0.99	0.88
Total SA	136	0.38	0.93	0.67
BP PLC	127	0.52	1.42	0.94
Aramco (Beta Estimate)		0.11	0.94	0.84

Source: Reuters, Marmore Analysis

Note: The Market Cap of Peers and 5 year beta of Peers are taken as of October 13, 2019 from Reuters and the Debt as of 2018 is considered. As market value of Aramco is not available, Aramco D/E is assumed at 0.11 which is close to Target Debt to Equity Ratio of 0.10.

Figure 4.14: Equity Risk Premiums for DOWJONES 30 Stock Index listed on NYSE



Source: Reuters, Marmore Analysis

Income and Balance Sheet Projections for Aramco

Based on the methodology and assumptions explained earlier, the Income and Balance Sheet Projections for the Upstream, Downstream and Combined Operations of Aramco were prepared, and these are presented below.

Income and Balance Sheet Projections for Upstream Activities

As seen from Table 5.1 below, the upstream segment is expected to see decline in sales during the first few years i.e. from 2018 to 2022 as the crude oil prices are expected to seek lower levels from the highs in 2018. (It is assumed that there is likely to be some softening in 2019 and given the historical cyclical pattern that has been assumed for these forecasts, the decline may be observed up to 2022 when the trough will be reached). Thereafter the upward leg of the cycle is expected in the remaining years. There are research reports that expect prices to be steady around USD 60[1] for next five years while some quarters expect prices to be down to USD 50 per barrel in 2020. But the vagaries of the oil market are difficult to predict and hence this valuation is based on the historically exhibited cyclical pattern. The simple average price for assumed for the forecasted period works to around USD 61.3. The price for perpetuity in 2028 is taken higher at USD 77.3 based on the future cyclical behavior post 2028 after adjusting it for inflation in future years.

The EBITDA margins will range between 64.7% to 76.4%. The Net Income margin will range b/w 31.2%-37.6%. The main cash outgoes are on account of the royalty payments to government and the high rates (compared to rest of the world) of income taxes. For perpetuity, the EBITDA margin is considered at 74.4% and Net income margin at 35.0%. The effective Income Tax Rate assumed is 48.0%.

Table 5.1: Upstream Activities – Income Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Revenues	**293.9**	**258.0**	**199.6**	**177.6**	**168.2**	**189.0**	**226.2**	**311.6**	**373.1**	**403.4**	**556.8**	**386.7**
Operating Costs	(78.0)	(61.2)	(53.1)	(50.5)	(49.8)	(53.7)	(60.0)	(73.6)	(94.7)	(107.5)	(196.6)	(98.9)
EBITDA	**215.9**	**196.8**	**146.5**	**127.1**	**118.3**	**135.3**	**166.2**	**238.0**	**278.4**	**295.9**	**360.2**	**287.8**
Depreciation and amortization	(7.3)	(8.1)	(9.0)	(9.9)	(10.9)	(11.9)	(12.9)	(14.1)	(15.3)	(16.5)	(17.9)	(19.2)

[4] Report from Fitch Solutions expects prices to be steady around USD 60 up to 2023

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
EBIT	**208.6**	**188.6**	**137.5**	**117.2**	**107.5**	**123.4**	**153.3**	**223.9**	**263.1**	**279.4**	**342.3**	**268.5**
Finance costs	0.0	(2.2)	(3.4)	(4.7)	(5.9)	(7.3)	(7.5)	(7.7)	(7.9)	(8.1)	(8.3)	(8.6)
Income before taxes	**208.6**	**186.4**	**134.1**	**112.5**	**101.5**	**116.2**	**145.8**	**216.3**	**255.2**	**271.3**	**334.0**	**260.0**
Income Taxes	(100.1)	(89.5)	(64.4)	(54.0)	(48.7)	(55.8)	(70.0)	(103.8)	(122.5)	(130.2)	(160.3)	(124.8)
Net Income	**108.5**	**96.9**	**69.7**	**58.5**	**52.8**	**60.4**	**75.8**	**112.5**	**132.7**	**141.1**	**173.7**	**135.2**

Source: Marmore Analysis

The balance sheet projections for the Upstream segment given in Table 5.2 below, show that the main component of the investment requirements for this segment are the fixed assets, with the working capital investments that are required being much lower (12% of total assets in 2018). In 2028 net fixed assets are estimated at USD 372 billion in comparison with current assets (excl. cash) of only USD 37 billion. The segment is also expected to enjoy high level of creditors for its purchases. The segment working capital could see variance as separate data concerning them in 2017-2018 are not available for making an accurate assessment. The Return on Assets (adjusted for cash & bank) will range from a low of 20.1% in 2022 to a high of 42.6% in 2028. The Return on Equity (adjusted for cash & bank) will range from a low of 47.8% in 2022 to 92.4% in 2028.

Table 5.2: Upstream Activities – Balance Sheet Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Property, plant and Equipment	162	183	204	225	246	267	288	309	330	351	372	392
Current Assets												
Inventories	7	7	8	8	8	8	9	9	9	9	10	10
Trade receivables	15	13	10	9	8	9	11	15	18	19	27	15

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
Cash and Cash Equivalents	-	106	187	257	320	392	450	543	658	783	939	1,066
Total Current Assets	22	127	205	273	337	409	469	567	685	812	976	1,090
Total Assets	**185**	**310**	**409**	**498**	**583**	**676**	**758**	**876**	**1,015**	**1,163**	**1,347**	**1,483**
Total Shareholders' equity	**153**	**250**	**320**	**378**	**431**	**491**	**567**	**680**	**812**	**953**	**1,127**	**1,262**
Non-current liabilities	27	56	86	117	148	152	157	161	165	170	174	179
Total Current Liabilities	5	4	3	3	3	32	34	35	38	40	46	41
Total Equity and liabilities	**185**	**310**	**409**	**498**	**583**	**676**	**758**	**876**	**1,015**	**1,163**	**1,347**	**1,483**

Source: Marmore Analysis

Income and Balance Sheet Projections for Downstream Activities

The revenues of the downstream are expected to fluctuate with the assumed fluctuations in crude oil prices. Accordingly, the revenues will decline up to 2022 and then reverse the trend to peak in 2028. The EBITDA which is derived from the gross margin will show steady growing trend, as the gross margin or value added per barrel though assumed constant in real terms for downstream products but grown for inflation in the future years. It is observed that the EBITDA from Downstream Activities is only 3.5% of the EBITDA of the Upstream Activities in 2028. The importance of the Downstream is however strategic, as it consumed about 26% of total oil production thus ensuring a steady demand for its mainstay product which is crude oil. Aramco is pursuing this strategy of tying up its oil supplies with downstream petroleum refineries to increase the proportion of stable oil demand. It recently tied up with Reliance Industries of India (the largest Oil & Gas Company and exporter in India) by acquiring an equity stake which will ensure supplies of its oil to the Indian market. The EBITDA margins are expected to range from a low of 4.0% in 2028 to a high 9.7% in 2022, the margins will be lower in the years of higher oil prices. The Net income margins are expected to range from a low of 1.4% in 2028 to a high 3.9% in 2022.

Table 5.3: Downstream Activities – Income Statement Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Revenue	**138.7**	**136.9**	**111.9**	**103.7**	**101.5**	**114.9**	**137.4**	**183.3**	**216.5**	**233.0**	**315.0**	**225.2**
Operating Costs	(131.4)	(128.6)	(103.0)	(94.3)	(91.6)	(104.5)	(126.4)	(172.0)	(204.8)	(220.9)	(302.5)	(212.4)
EBITDA	**7.2**	**8.3**	**8.8**	**9.3**	**9.9**	**10.4**	**11.0**	**11.3**	**11.7**	**12.1**	**12.5**	**12.8**
Depreciation and amortization	(3.7)	(3.7)	(3.7)	(3.7)	(3.8)	(3.8)	(3.9)	(3.9)	(3.9)	(4.0)	(4.0)	(4.0)
EBIT	**3.6**	**4.7**	**5.1**	**5.6**	**6.1**	**6.6**	**7.1**	**7.4**	**7.8**	**8.1**	**8.5**	**8.7**
Finance costs	0.0	0.0	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)
Income before taxes	**3.6**	**4.7**	**5.1**	**5.5**	**6.0**	**6.5**	**7.0**	**7.3**	**7.6**	**8.0**	**8.3**	**8.6**
Income Taxes	(1.7)	(2.2)	(2.5)	(2.7)	(2.9)	(3.1)	(3.3)	(3.5)	(3.7)	(3.8)	(4.0)	(4.1)
Net Income	**1.9**	**2.4**	**2.7**	**2.9**	**3.1**	**3.4**	**3.6**	**3.8**	**4.0**	**4.1**	**4.3**	**4.5**

Source: Marmore Analysis

The balance sheet projections for the downstream activities are shown in Table 5.4 below. It is seen in the case of downstream activities current asset requirements are higher proportion compared to upstream activities and accounted for about 28% of total assets in 2018. The Return on Assets (adjusted for cash) is expected to increase from 2.6% in 2019 to 4.3% in 2028. The Return on Equity (ROE) is expected to increase from 3.2% in 2019 to 7.7% in 2028.

Table 5.4: Downstream Activities – Balance Sheet Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Revenue	**138.7**	**136.9**	**111.9**	**103.7**	**101.5**	**114.9**	**137.4**	**183.3**	**216.5**	**233.0**	**315.0**	**225.2**
Non-current assets												
Property, plant and Equipment	70.5	66.9	63.9	60.8	57.8	54.7	51.6	48.5	45.3	42.1	38.9	35.3
Current Assets												
Inventories	4.6	4.5	3.6	3.3	3.2	3.7	4.5	6.1	7.2	7.8	10.7	7.5
Trade receivables	9.8	9.6	7.9	7.3	7.1	8.1	9.7	12.9	15.2	16.4	22.2	15.8
Dues from Government	12.8	12.7	10.4	9.6	9.4	10.6	12.7	17.0	20.0	21.6	29.2	20.8
Cash and Cash Equivalents	(0.1)	5.9	13.8	20.8	27.8	34.0	40.7	44.7	49.8	56.1	58.4	72.2
Total Current Assets	27.1	32.8	35.6	41.0	47.5	56.4	67.5	80.7	92.3	101.8	120.5	116.4
Total Shareholders' equity	**80.4**	**82.8**	**85.5**	**88.4**	**91.5**	**94.9**	**98.5**	**102.3**	**106.2**	**110.4**	**114.7**	**119.2**
Non-current liabilities	-	-	0.7	1.4	2.1	2.8	3.6	3.7	3.7	3.8	3.9	4.0
Total Current Liabilities	17.2	16.8	13.3	12.1	11.7	13.4	17.0	23.2	27.6	29.8	40.8	28.6
Total Equity and liabilities	**97.7**	**99.6**	**99.5**	**101.9**	**105.3**	**111.1**	**119.1**	**129.1**	**137.6**	**144.0**	**159.4**	**151.7**

Source: Marmore Analysis

Income and Balance Sheet Projections for Combined Activities of Company

The Income statement projection and balance sheet projections for the total Company, i.e. the sum of Upstream Activities, Downstream Activities, the Corporate namely Investments and Joint Ventures, after adjusting for interdivisional adjustments are presented below together with the ratio comparison with peer companies like Exxon Mobil, Total, Royal Dutch, Chevron and British Petroleum operating in the international arena.

The overall EBITDA Margins of the Company are expected to improve from 62.8% in 2018 (actuals) to 64.1% in 2019 (projected) to 53.8% in 2028 (projected). The Net Income Margin is expected to decline from 31.0% in 2018 (actuals),and 31.4% in 2019 to 25.8% 2028 respectively. The ROA (excluding cash) for the company is expected to decrease from 35.6% in 2018 to 15.8% in 2022 and 35.4% in 2028. The ROE (excluding cash is expected) to improve from 48.9% in 2018 and 34.3% in 2022 to 75.8% in 2028 (this being a peak year in the crude oil cycle).

Table 5.5: Combined Activities of Company – Income Statement Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Revenues	**355.6**	**319.9**	**252.1**	**227.3**	**217.5**	**244.1**	**290.8**	**394.6**	**469.6**	**506.8**	**693.0**	**433.0**
Operating Costs	(132.4)	(114.8)	(96.8)	(90.9)	(89.3)	(98.4)	(113.6)	(145.3)	(179.5)	(198.7)	(320.3)	(132.5)
EBITDA	**223.2**	**205.1**	**155.3**	**136.4**	**128.2**	**145.7**	**177.2**	**249.3**	**290.1**	**308.0**	**372.7**	**300.5**
Depreciation and amortization	(11.0)	(11.8)	(12.7)	(13.6)	(14.6)	(15.7)	(16.8)	(18.0)	(19.2)	(20.5)	(21.9)	(23.3)
EBIT	**212.2**	**193.3**	**142.6**	**122.8**	**113.6**	**130.0**	**160.4**	**231.4**	**270.9**	**287.5**	**350.8**	**277.3**
Share of JVs & Finance Income	**0.7**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**0.0**
Finance costs	(0.8)	(2.2)	(3.5)	(4.7)	(6.0)	(7.4)	(7.6)	(7.8)	(8.0)	(8.3)	(8.5)	(8.7)
Income before income taxes	**212.0**	**192.1**	**140.2**	**119.1**	**108.6**	**123.7**	**153.8**	**224.6**	**263.9**	**280.3**	**343.3**	**268.6**
Income Taxes	(101.8)	(91.7)	(66.8)	(56.7)	(51.6)	(58.9)	(73.3)	(107.3)	(126.2)	(134.0)	(164.3)	(128.9)
Net Income	**110.2**	**100.4**	**73.4**	**62.4**	**57.0**	**64.8**	**80.5**	**117.3**	**137.7**	**146.2**	**179.0**	**139.6**

Source: Marmore Analysis

Table 5.6: Combined Activities of Company – Balance Sheet Projections (2019-2029)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Perpetuity
(USD billion)	(E)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
Non-current assets												
Property, plant and Equipment	233	250	268	286	304	322	340	358	375	393	411	427
Other Non-current assets	24	24	24	24	24	24	24	24	24	24	24	24
Current Assets												
Inventories	12	12	11	11	11	12	13	15	16	17	21	18
Trade receivables	25	23	18	16	15	17	20	28	33	36	49	30
Dues from Government	13	13	10	10	9	11	13	17	20	22	29	21
Other current assets	52	112	162	206	247	291	314	350	398	452	517	585
Cash and Cash Equivalents	49	109	159	203	244	288	310	346	395	449	514	582
Total Current Assets	**102**	**159**	**202**	**243**	**283**	**331**	**360**	**409**	**467**	**527**	**616**	**654**
Total Assets	**358**	**433**	**494**	**553**	**611**	**676**	**724**	**791**	**867**	**944**	**1,050**	**1,105**
Total Shareholders' equity	**274**	**321**	**355**	**384**	**410**	**440**	**477**	**532**	**597**	**666**	**750**	**817**
Non-current liabilities	44	73	103	135	167	172	177	181	186	190	195	200
Total Current Liabilities	41	39	35	34	33	64	69	77	84	88	105	88
Total Equity and liabilities	**359**	**433**	**494**	**553**	**611**	**676**	**724**	**791**	**867**	**944**	**1,050**	**1,105**

Source: Marmore Analysis

Aramco's Key Financial Ratios and Comparison with Peers (2018-2023)

Table 5.7 below gives the 2018 ratios for Aramco and a comparison with those of other peers in the same year as well as ratios for Aramco over the forecast period 2019-2023. The ratio comparison shows that Aramco enjoys much higher profitability and returns over that of its peers in the international arena.

Table 5.7: Aramco's Key Financial Ratios and a comparison with those of Peer Companies

Year	Royal Dutch	Exxon	Chevron	BP	Total SA	Aramco	Aramco	Aramco	Aramco	Aramco	Aramco
	2018	2018	2018	2018	2018	2018	2019	2020	2021	2022	2023
Profitability											
Gross Margin	17.3%	31.0%	40.5%	15.1%	31.3%	65.8%	67.6%	66.2%	65.2%	64.6%	64.8%
EBITDA Margin	14.6%	14.3%	22.0%	11.4%	16.3%	62.8%	64.1%	61.6%	60.0%	59.0%	59.7%
Operating Margin	7.8%	7.5%	9.7%	5.0%	9.0%	59.7%	60.4%	56.6%	54.0%	52.2%	53.3%
Pretax Margin	9.2%	11.1%	13.0%	5.6%	9.8%	59.6%	60.0%	55.6%	52.4%	49.9%	50.7%
Effective Tax Rate	32.9%	31.7%	27.9%	43.4%	36.1%	48.0%	47.7%	47.6%	47.6%	47.5%	47.6%
Net Margin	6.2%	7.6%	9.3%	3.2%	6.3%	31.0%	31.4%	29.1%	27.5%	26.2%	26.6%
DuPont/Earning Power											
Asset Turnover	0.96	0.80	0.63	1.07	0.74	1.01	1.35	1.96	2.43	2.81	2.77
x Pretax Margin	9.2%	11.1%	13.0%	5.6%	9.8%	59.6%	60.0%	55.6%	52.4%	49.9%	50.7%
Pretax ROA	8.8%	8.9%	8.1%	6.0%	7.2%	59.1%	44.4%	28.4%	21.5%	17.8%	18.3%
x Leverage (Assets/Equity)	2.01	1.81	1.64	2.84	2.22	1.31	1.35	1.39	1.44	1.49	1.54
Pretax ROE	18.1%	16.3%	13.6%	16.9%	15.9%	77.3%	59.8%	39.5%	31.0%	26.5%	28.1%
x Tax Complement	65.6%	67.3%	72.0%	56.1%	63.4%	48.0%	47.7%	47.6%	47.6%	47.5%	47.6%
ROE	11.9%	10.8%	9.8%	9.4%	10.2%	37.1%	28.6%	18.8%	14.8%	12.6%	13.4%

Year	Royal Dutch	Exxon	Chevron	BP	Total SA	Aramco	Aramco	Aramco	Aramco	Aramco	Aramco
	2018	2018	2018	2018	2018	2018	2019	2020	2021	2022	2023
Reinvestment Rate	3.9%	3.6%	4.2%	2.6%	3.1%	17.7%	13.6%	9.0%	7.0%	6.0%	6.4%
Leverage											
Assets/Equity	2.01	1.81	1.64	2.84	2.22	1.31	1.35	1.39	1.44	1.49	1.54
Debt/Equity	0.39	0.20	0.22	0.66	0.45	0.10	0.17	0.24	0.31	0.37	0.42
% LT Debt to Total Capital	24%	9%	15%	34%	23%	8%	13%	18%	21%	25%	23%
(Total Debt - Cash) / EBITDA	1.04	0.92	0.83	1.22	0.61	-0.10	-0.26	-0.47	-0.62	-0.73	-0.71
Quick Ratio	0.98	0.51	1.04	0.78	1.04	2.21	3.75	5.40	6.83	8.12	4.95
Current Ratio	1.25	0.84	1.25	1.05	1.28	2.50	4.05	5.72	7.16	8.46	5.14

Source: Reuters, Marmore Analysis

Chapter 6

Free Cash Flow Analysis for Saudi Aramco

Based on the Projections of Income Statement and the Balance Sheet, the free cash flows during the explicit forecast period from 2019-2028, as well as that for perpetuity i.e. the continuing period after the explicit forecast period are estimated. For the continuing period or perpetuity, the growth rate is expected lower than that for the explicit forecast period.

Free Cash Flows (FCF) Projections for Upstream Activities.

The FCF projections for Upstream during the explicit forecast period are based on an underlying growth rate of 1.7% per annum (p.a.). For the perpetuity, the growth rate is assumed at 0.8% p.a. The FCF is derived by taking Net Profit, adding back depreciation which is a non-cash expense, adding back interest, as the FCF is being calculated at the firm level, and deducting the incremental capital expenditure and the incremental working capital for the year. The FCFs are then discounted to their present value at their WACC assumed at 7.9% (based on cost of equity of 8.6% and debt at 4.0% at a target debt to equity of 10%) and their sum taken. Next, the perpetuity value is estimated by taking the FCF for perpetuity which is FCF in 2029 at perpetuity growth rate divided by (WACC-Perpetuity Growth rate) and this is discounted to obtain its present value. The sum of FCFs (explicit period plus Perpetuity period) minus the Outstanding Debt gives the equity market value of the upstream activities. The resulting equity value of upstream can be seen to be USD 1,406 billion from Table 6.1 below.

Table 6.1: FCF Valuation of Upstream – Aramco (USD billion)

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Net Profit	96.9	69.7	58.5	52.8	60.4	75.8	112.5	132.7	141.1	173.7
Add: Depreciation	8.1	9.0	9.9	10.9	11.9	12.9	14.1	15.3	16.5	17.9
Add: Interest	2.2	3.4	4.7	5.9	7.3	7.5	7.7	7.9	8.1	8.3
Less: Increase in Working Capital	1.2	2.3	0.8	0.3	(1.0)	(1.6)	(3.6)	(2.0)	(1.0)	(2.5)
Less: Increase in Capex for Expansion	(28.9)	(29.9)	(30.8)	(31.9)	(32.9)	(34.0)	(35.1)	(36.2)	(37.4)	(38.7)
Free Cash Flow for the Year	79.6	54.6	43.0	38.0	45.7	60.7	95.5	117.6	127.3	158.7
Discount Factor for the Year	**0.981**	**0.909**	**0.842**	**0.780**	**0.723**	**0.669**	**0.620**	**0.574**	**0.532**	**0.493**
Discounted Value of FCF for the Year	**78.1**	**49.6**	**36.2**	**29.6**	**33.0**	**40.6**	**59.2**	**67.6**	**67.7**	**78.2**
Total FCF for 2019-2028	**539.9**									
PV of Perpetuity Value in 2028	893									
Total EV of the Upstream Business	1432.8									
Less: Outstanding Debt	(27.0)									
Equity Value of the Upstream Business of Aramco	1405.8									

Source: Marmore Analysis

Free Cash Flows (FCF) Projections for Downstream Activities.

The FCF projections for Downstream during the explicit forecast period are based on an underlying growth rate of 2.0% p.a. For the perpetuity, the growth rate is assumed at 1.0% p.a. The FCFs are then discounted to their present value at their WACC assumed at 7.9% and their sum taken. Using this, as explained above, the equity market value of the downstream activities is obtained. The resulting equity value of downstream segment of USD 139.7 billion can be seen from Table 6.2 below.

Table 6.2: FCF Valuation of Downstream – Aramco (USD billion)

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Net Profit	2.4	2.7	2.9	3.1	3.4	3.6	3.8	4.0	4.1	4.3
Add: Depreciation	3.7	3.7	3.7	3.8	3.8	3.9	3.9	3.9	4.0	4.0
Add: Interest	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Less: Increase in Working Capital	(0.1)	1.5	0.4	0.1	(0.9)	(1.5)	(3.0)	(2.2)	(1.1)	(5.2)
Less: Increase in Capex for Expansion	0.0	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(0.8)	(0.8)	(0.8)	(0.8)
Free Cash Flow for the Year	6.0	7.2	6.4	6.3	5.6	5.4	4.1	5.1	6.4	2.4
Discount Factor for the Year	**0.981**	**0.909**	**0.842**	**0.780**	**0.723**	**0.669**	**0.620**	**0.574**	**0.532**	**0.493**
Discounted Value of FCF for the Year	**5.9**	**6.5**	**5.4**	**4.9**	**4.1**	**3.6**	**2.5**	**2.9**	**3.4**	**1.2**
Total FCF for 2019-2028	40.5									
PV of Perpetuity Value in 2028	99									
Total EV of the Downstream Business	139.7									
Less: Outstanding Debt	0.0									
Equity Value of Downstream Business of Aramco	139.7									

Source: Marmore Analysis

Chapter 7

Equity Value of Aramco (Upstream plus Downstream plus other assets)

The value of the total company includes the investments in joint ventures which has been considered at their book value, book value of financial investments and securities, other assets and the outstanding cash and bank balances. Also the dividends paid/ announced including interim dividends which will not be shared with the public investors in 2019 are deducted from the Valuation. The results of the analysis are presented in the Table 7.1 below.

Table 7.1: Equity Value of Combined Company

			USD Billion	
Equity Value of Aramco	UPS	DWS	Corporate	Total
PV of Free Cash Flows (2019-2028)	539.92	40.48	0.00	580.40
PV of Perpetuity Value	892.85	99.26	0.00	992.12
Enterprise or Firm Value	**1,432.78**	**139.74**	**0.00**	**1,572.52**
Less: Outstanding Debt	(27.02)	0.00		(27.02)
Less: Deferred Income Tax Liabilities	0.00	0.00	(6.37)	(6.37)
Less: Provisions	0.00	0.00	(4.16)	(4.16)
Less: Post Employment Benefit Obligations	0.00	0.00	(6.19)	(6.19)
Add: Cash & Bank Balances	0.00	0.00	48.74	48.74
Add: Deferred Income Tax Assets	0.00	0.00	2.63	2.63
Add: Investment in Joint Ventures	0.00	0.00	6.02	6.02
Add: Investment in Securities	0.00	0.00	4.59	4.59
Add: Short Term Investments	0.00	0.00	0.05	0.05
Less: Dividends for 2019 Not shared				(69.29)
Total Equity Value	**1,405.76**	**139.74**	**45.31**	**1,521.52**

Source: Marmore Analysis

Based on the combined equity value of USD 1,522 billion the implicit P/E ratio, EV/EBITDA ratio and P/BV ratio for Aramco are 13.81, 6.94 and 5.55 respectively. It may be observed that the valuation of USD 1.522 trillion implies that a net present value of about USD 6.09 per barrel is available to shareholders from company's proven reserves of 250 billion barrels, which can be considered to be moderate and attractive. There is a potential upside that can happen, if the Saudi Government reduces the applicable IT Rates in the future as they are presently very high compared to global rates. Further in the present era of negative interest rates investors may be attracted even with a lower cost of equity than the 8.6% assumed in this valuation and this will also provide an upside to the Valuation. On the other hand, the Valuation is based on an Inflation rate of around 1.55% in US, but forecasted inflation rate is higher according to an IMF forecast, and in case the US Dollar inflation is higher the inflation adjusted oil price forecast will be somewhat higher assuming oil prices adjust to inflation in US (meaning higher inflation means weaker US Dollar and that means increase in oil prices) and this can be an upside for the Valuation. A comparison of the implicit valuation ratios of Saudi Aramco with those of its peers is given in Table 7.2 below.

Table 7.2: Implicit Valuation Ratios of Aramco & Peer Comparison

	P/E Ratio	EV/EBITDA	P/BV Ratio	ROE
Saudi Aramco	**13.81**	**6.94**	**5.55**	**37.1%**
Royal Dutch	12.59	5.61	1.34	11.9%
Exxon	16.90	9.60	1.84	10.8%
Chevron	16.33	7.58	1.55	9.8%
BP	11.58	5.72	1.49	9.4%
Total SA	11.17	5.71	1.27	10.2%

Source: Reuters, Marmore Analysis

Note : The Valuation Ratios of Peers is based on market price as of October 13, 2019 and 2018 numbers are used for EPS, EBITDA, Book Value and ROE. The Implicit ratios for Saudi Aramco are based on the estimated valuation divided by 2018 profits and other numbers

Saudi Aramco is expected to have attractive valuation ratios in the industry. The implicit P/E ratio for Aramco based on this valuation is however lower compared to that of Exxon, while its higher P/E compared to other peers maybe explained mainly by the high level of proven reserves for Aramco that will ensure a higher long-term average revenue potential per year compared to its peers. The higher implicit P/BV ratio for Aramco can be explained by its much higher ROE (37.1% versus 10.8 % for Exxon) compared to its peers as well as the much larger proven reserves exceeding 60 years production while other peers are stated to be having reserves equivalent to about 15 years.

Political and Governance Risks that may Influence Saudi Aramco Valuation

Notwithstanding a good international response to Saudi Aramco's international bonds issued in 2019 that currently provide a yield of about 4% p.a. that is taken by investors as a possible repudiation of the confidence in country, recent newspaper reports express concern that Aramco entails political risks that could keep international investors away if an international offering is made by Saudi Aramco in the future. It is reported that since Aramco is State-owned since 1980, and since the company currently provides about two-thirds of the kingdom's revenue it carries political risk. For example, shares in government-run Russian gas giants Gazprom and Rosneft trade at a discount to publicly owned Chevron, BP and the other major integrated oil-and-gas companies. There are concerns about how Aramco will balance the needs of the country with the needs of the company. Saudi Government's funding needs may mean government taxes quasi sovereigns if we go by what happens in other emerging markets.

Moreover, Saudi Aramco's assets are in a volatile region. Recent attacks on the company's processing facilities crystallized a theoretical risk for the geographically concentrated reserves. Aramco did restore the services within days, though, much more quickly than expected[5].

Also, the risk of Aramco's state ownership structure may mean minority investors will have little influence over Aramco's operations even after it lists. Also, the Saudi government would remain by far the dominant shareholder with a 98% stake if Aramco only sells the minimum amount targeted in the offering.

Morgan Stanley is latest bank to offer $1 trillion Saudi Aramco spread

Among 16 banks that offered a valuation, the range in estimates ran from $1.1 trillion at the bottom right up to $2.5 trillion

Morgan Stanley is one of the most bearish — and bullish — on Saudi Aramco's valuation.

In a presentation for investors, Morgan Stanley bankers ran through several valuation models that gave a spread of about $1 trillion between the most bearish and bullish scenarios.

For example, based on a dividend discount model the spread ran from $1.06 trillion up to $2 trillion. **The base case was $1.52 trillion, according to the presentation seen by Bloomberg**. A spokesman for Morgan Stanley declined to comment.

Morgan Stanley isn't alone in struggling to pinpoint exactly how much Aramco is worth. Valuation has been a sticking point since the IPO was first touted in 2016. Aramco faces a delicate balance as it seeks to push its IPO valuation as close as possible to Crown Prince Mohammed Bin Salman's $2 trillion — a figure that's been met with skepticism from many professional investors — while making sure it's attractive to potential Saudi buyers.

Range of some of the banks with the IPO mandate:

Bank of America $1.2 trillion $2.4 trillion
Goldman Sachs $1.6 trillion $2.3 trillion
HSBC $1.6 trillion $2.1 trillion
Royal Bank of Canada $1.3 trillion $2.2 trillion

Another Morgan Stanley scenario shows a valuation of between $1 trillion and $2.2 trillion, according to the presentation. A third model shows a range of $1.07 trillion and $2.5 trillion.

Among 16 banks that offered a valuation, the range in estimates ran from $1.1 trillion at the bottom right up to $2.5 trillion, a number that even the Crown Prince might find optimistic. The midpoint was $1.75 trillion, according to people who've reviewed all the research.

This $1.4 trillion spread between the top and low end of valuations is more than the combined market capitalizations of Exxon Mobil Corp., Royal Dutch Shell Plc and Chevron Corp, the world's three largest publicly listed energy companies.

Ultimately, investors will decide. The price range for the IPO will be announced on Nov. 17 and book building for the offering will start the same day. Retail investors will have to bid at the top end of that range and the company will set the final price for all investors based on institutional investors' book-building process that ends on Dec. 5.

[5] https://www.wsj.com/articles/saudi-aramco-the-buyers-matter-more-than-the-price-11572957065?mod=searchresults&page=1&pos=5

Chapter 8

Sensitivity Analysis of Aramco's Valuation Estimate

A sensitivity analysis of Aramco's Valuation with respect to Cost of Equity and Growth Rate to Perpetuity is presented in the Table 8.1 below.

It is observed that increase in the cost of equity from the Reference Case Value of 8.6% to a higher value of say 9.1% will result in drop in the valuation from USD 1,522 billion to USD 1,416 billion, on the other hand a lower cost of equity of say 8.1% will push the valuation up to USD 1,642 billion. This case is important as the Risk Free based on 10-year US Government bond yields is low compared to long term rates driven mainly by quantitative Easing by the Central Banks in recent years and can go up in the future once economic growth takes on a sustained trajectory, while on the other hand currently prevailing negative to zero interest rates the cost of equity to attract investors might be lower. Also, a upside exists in case higher perpetual growth rate becomes feasible, once the world economic growth prospects improve or the Aramco's market share increase due to its high oil reserves while other players fall short of reserves in the future. A perpetual growth rate of 1.50 % for Upstream and 1.75% for Downstream will increase the valuation to USD 1,647 billion compared to the reference Case. Table 8.1 also presents scenarios if changes to both variables happens simultaneously.

Table 8.1: Sensitivity Analysis of Aramco Valuation to Change in Equity Cost & Perpetual Growth

Change in Cost of Equity	Change in Perpetuity Growth Rate								Cost of Equity
	-0.25%	0.00%	0.25%	0.50%	0.75%	1.00%	1.25%	1.50%	
-1.50%	1,882	1,942	2,008	2,080	2,160	2,247	2,344	2,453	7.10%
-1.25%	1,803	1,859	1,919	1,984	2,056	2,134	2,221	2,318	7.35%
-1.00%	1,731	1,781	1,836	1,895	1,960	2,031	2,109	2,196	7.60%
-0.75%	1,663	1,709	1,759	1,814	1,873	1,937	2,007	2,085	7.85%
-0.50%	1,600	1,642	1,688	1,738	1,792	1,850	1,914	1,984	8.10%
-0.25%	1,541	1,580	1,622	1,668	1,717	1,770	1,828	1,892	8.35%
0.0%	1,485	1,522	1,560	1,602	1,647	1,696	1,749	1,807	8.60%

Change in Cost of Equity	Change in Perpetuity Growth Rate: -0.25%	0.00%	0.25%	0.50%	0.75%	1.00%	1.25%	1.50%	Cost of Equity
0.25%	1,433	1,467	1,503	1,541	1,583	1,627	1,676	1,728	8.85%
0.50%	1,384	1,416	1,449	1,484	1,523	1,564	1,608	1,656	9.10%
0.75%	1,338	1,367	1,398	1,431	1,466	1,504	1,545	1,589	9.35%
1.00%	1,295	1,322	1,350	1,381	1,414	1,448	1,486	1,526	9.60%
1.25%	1,254	1,279	1,306	1,334	1,364	1,396	1,431	1,468	9.85%
1.50%	1,215	1,239	1,263	1,290	1,318	1,348	1,380	1,414	10.10%

Perpetuity Growth Rate

Upstream	0.50%	0.75%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%
Downstream	0.75%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%

Source: Reuters, Marmore Analysis

Authors

M.R. Raghu CFA, FRM, FCMA
Head of Research
+965 2224 8280
rmandagolathur@markaz.com

Shishir Goenka
Senior Manager - Research
+965 2224 8000 Ext: 4633
SGoenka@e-marmore.com

Venkatram Kolluri
Senior Consultant
+965 2224 8000
VKolluri@e-Marmore.com