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SAUDI ARAMCO'S INITIAL PUBLIC OFFERING: OVER OR UNDERPRICED?

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Master in Finance

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BUSINESS
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Department of Finance

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To my family, especially my mother and brother who are always there for me, never gave up despite the adversities in our life and never doubted that I would be able to do this.

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Resumo

A indústria do Petróleo e Gás é uma das mais valiosas do mundo e tem, ao longo dos anos, sido alvo de uma grande variação de preços no mercado apesar de visivelmente correlacionada com o Produto Interno Bruto. Os membros da Organização dos Países Exportadores de Petróleo (OPEP) são responsáveis por 44% da produção mundial de petróleo e detém 81.5% das reservas de petróleo provadas – Isto significa que a Organização pode manipular os preços de mercado ao acordar entre si um corte ou uma aceleração da produção.

A Saudi Aramco é a empresa nacional de petróleo da Arábia Saudita e líder da OPEP, não só por ser a maior fornecedora de petróleo do mundo, mas também por ser a empresa mais rentável e que tem acesso a uma das maiores reservas de petróleo, suficiente para assegurar produção por pelo menos 52 anos.

Em 2019, o governo da Arábia Saudita decidiu vender 1.5% das ações da empresa na bolsa de valores local que se tornou na maior Oferta Pública Inicial (OPI) de sempre.

Este projeto pretendeu analisar o valor da empresa através de diferentes métodos de avaliação e comparar os mesmos com o valor inicial da ação oferecido na OPI (USD 8.53).

Os resultados da avaliação realizada apontam para uma sobreavaliação da ação, o que não impediu o sucesso da OPI, provavelmente devido às oportunidades de investimento limitadas no país mas também devido ao perfil muito sólido da empresa.

Palavras-chave: Finanças da Empresa; Avaliação, Oferta Pública Inicial

JEL Classification code: G30 - Corporate Finance and Governance: General; G32 - Corporate Finance and Governance: Value of Firms

Abstract

The integrated Oil and Gas (O&G) industry is one of the most valuable industries in the world and has, over the years, been subject to great fluctuations in the market although visibly correlated to the overall GDP evolution. Members of the Organization of the Petroleum Exporting Countries (OPEC) are responsible for ca. 44% of the worldwide oil production and detain control over 81.5% of the world's proved oil reserves – This means that the countries can easily manipulate the O&G prices by agreeing to cut down or accelerate production.

Saudi Aramco is the Saudi Arabian national oil company and not only is the world's leading oil supplier but it is also the most profitable and has access to one of the largest proven oil and gas reserves that secure production for at least 52 years being therefore the leader of OPEC.

At the end of 2019, the Kingdom of Saudi Arabia has decided to list 1.5% of Aramco's shares in the local stock exchange which turned into the largest IPO ever.

This equity research aimed to evaluate the company using different valuation methods and compare the results with the initial share price offered in the IPO (USD 8.53).

The results obtained in the valuation of the company point out towards an overpriced scenario which did not impact the success of the IPO likely due to the limited investment opportunities from Saudi Arabia but also the company's very solid profile.

Keywords: Corporate Finance; Valuation; Initial Public Offering

JEL Classification code: G30 - Corporate Finance and Governance: General; G32 - Corporate Finance and Governance: Value of Firms

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Glossary:

Bn - Billion

Boe – Barrel of Oil Equivalent

CAGR – Compound Annual Growth Rate

CAPEX – Capital Expenditures

CAPM - Capital Asset Pricing Model

CRP – Country Risk Premium

DCF – Discounted Cash Flow

DTA – Decision Tree Analysis

D&A – Depreciation and Amortization

DDM - Dividend Discount Model

EBITDAX – Earnings before interests, taxes, depreciation, amortization and exploration expenses

EV – Enterprise Value

FCFE – Free Cash Flow to the Equity

FCFF – Free Cash Flow to the Firm

FY – Full Year

GDP – Gross Domestic Product

GMTN - Global Medium Term Note

IPO – Initial Public Offering

NGL – Natural Gas Liquids

NOPLAT - Net Operating Profit Less Adjusted Taxes

OECD – Organization for Economic Co-operation and Development

OPEC - Organization of the Petroleum Exporting Countries

O&G – Oil & Gas

PV – Present Value

R&D – Research and Development

TV - Terminal Value

USD – United States Dollar

WACC – Weighted Average Cost of Capital

1. Introduction

Valuing a company is widely used to serve as basis for investment decisions related to corporate strategy (e.g.: mergers and acquisitions, IPOs) but it is also frequently used by retail investors or portfolio managers who want to assess the value of an asset before buying its shares.

An equity research includes an in-depth study of a company's historical operating performance, industry environment and its trends.

The company chosen for the project was Saudi Aramco due to the fact that the company is not only the most profitable worldwide with a net profit of USD 111bn in 2018 but it is also located in a country which has one of the richest proven oil reserves (ranking 2, right after Venezuela) and is significantly impacted by the exportations of the company. Additionally, the curiosity regarding the massive O&G industry was also one of the factors that led to this choice.

Aramco holds the monopoly to produce from the Kingdom's reserves which was the company's sole owner up until 2019, when they decided to list 1.5% of its shares. Due to size and the solid profile of the company, the valuable industry it is inserted and potentially the limited investment opportunities in Saudi Arabia, Aramco's IPO has become the largest ever, surpassing the biggest until then (Apple and Microsoft) and generating a lot of debate about whether it was overvalued.

The Equity Research begins with the literature review that provides context over what does an IPO really means and why is valuation so important. Moreover, the main valuation methodologies are presented in order to provide background to the company's analysis.

The project will include: i) a presentation of the company; ii) an overview of the O&G industry (including different types of players); iii) the financial analysis of Saudi Aramco historical performance; iv) a business forecast for five years based on assumptions duly explained and v) the cost of capital of Saudi Aramco explicitly calculated, step-by-step.

In order to be able to compare the initial price at which Saudi Aramco was first listed, different valuation methods will be used, notably the Discounted Cash Flow (including FCFE, FCFE and DDM) and the Relative Valuation. Finally, and given that Equity Researches often have variables that, with a minor change, can have a significant impact on the final result, a sensitivity analysis will be presented based on FCFE.

The average price per share from all methodologies was USD 6.78 vs. the initial price of USD 8.53 indicating an overvaluation – Nevertheless, the initial interest of the market was immense and led to the stock jumping by 10% to USD 9.38 in the same day and to continue on

a positive trend in the following days ultimately leading to the Crown Prince's initial goal of a market value of USD 2 trillion.

2. Literature Review

2.1. Initial Public Offering (IPO)

An IPO is essentially the process of publicly selling a stock for the first time with the goal of listing the shares of the company in a stock exchange. The two main advantages of an IPO are the improved liquidity and easier access to capital, but the cost for this process is rather high. Although this gives the shareholders of a certain company the ability to diversify, this is also a disadvantage in the sense that the equity holders of the firm become more broadly distributed (Berk and DeMarzo, 2016). Moreover, by going public, a company has to comply with an extensive set of requirements that, among other things, demands the disclosure of its financial information with additional transparency, detail and an increased periodicity thereafter. For large IPOs there are two types of offerings which can sometimes happen simultaneously: Primary Offerings where a company issues new shares for the first time to the public or Secondary Offerings which consist of existing shares being sold as part of a shareholder exit strategy, often to a pre-agreed third-party.

The process of valuation is even more important when it is related to an IPO as the initial price can set the success of an IPO or the other way around. It is noteworthy that the initial share price is usually underpriced, increasing significantly since the issuance until the end of the day (Berk and DeMarzo, 2016).

2.2. Valuation Methodologies

According to Damodaran (2011) valuation is important, not only for investors to make wise decisions, but also at every stage of a company's life cycle – either because a firm might want to raise capital, go public or even engage in an M&A transaction.

There are three main general valuation approaches: (i) Discounted Cash Flow (DCF) – to arrive at a value of equity or firm; (ii) Relative valuation (through multiples) where the value of an asset is given by comparison to similar ones and (iii) Contingent Claim valuation, through option pricing (Damodaran, 2012). There is an extensive amount of literature related to evaluation in general, and DCF in specific, given the importance of the latest to comprehend and analyze the other models.

2.2.1 Discounted Cash Flow Model (DCF)

The major strength of DCF approach to value a company is driven by the fact of being entirely focused on the cash flows of the company, rather than on accounting-based measures (namely earnings), collapsing the future performance of the company in a single value (Koller et al., 2020).

According to Mota et al. (2015), DCF determines the value of the company in a dynamic perspective, rather than on a static one being valued by its potential to create wealth. The model is therefore not focused on the past, but on the ability to create cash flows in the future instead. The basis for this method is the Present Value (PV), which is essentially the result of future cash flows discounted at a certain rate.

$$DCF = \sum_{t=1}^{t=n} \frac{CF_n}{(1+i)^n} \quad (1)$$

Where:

CF= Cash Flow

i = Discount rate

t = Time horizon

To mitigate the uncertainty that comes with each additional cash flow forecasted on the back of the assumptions made and the uncertain future, Damodaran (2011) defend an estimation of 5 years of cash flows or even less when applicable / possible. Consequently, Mota et al. (2015) states that the Continuing Value of a company (value of cash flow after the forecasted period) is of great importance in the process of valuation as it includes the value of the company thereafter assuming that it will continue to operate on a perpetual basis while growing at a certain constant growth rate (g). This second part of valuation is also described as the Terminal Value (TV) since it essentially aggregates the distant future into one value (the TV) and can be seen as the estimate sale price at some point in time (Larrabee and Voss, 2013). In line with this, Koller et al., (2020) states that the Continuing Value often accounts for a large part of a firm's total value, whereby the assumed growth rate in perpetuity (g) should be applied for valuation purposes, only when a company has reached a stable state, with modest growth in revenue (typically in line with a sustainable growth of the economy) and constant operating margins.

Under the DCF approach, the Free Cash Flow to the Firm (FCFF) and the Free Cash Flow to Equity (FCFE) are the two most well-known methods to determine a corporate's value with FCFF being the most used as incorporates in a simpler way the company's debt (Mota et al., 2015).

2.2.1.1. Free Cash Flow to the Firm (FCFF)

FCFF is independent from a company's financing, being simply the result from the operational cash flow minus capital expenditures (CAPEX) - investment in new assets either to expand or for maintenance purposes (Larrabee and Voss, 2013). Hence, FCFF represents the cash that can

be generated by the company's operational activity, after the investment in CAPEX, resulting into the funds that are available to return to the holders of the capital invested in the firm, either through equity or debt (Mota et al., 2015).

$$FCFF = EBIT (1 - t) + D\&A - \Delta WC - CAPEX \quad (2)$$

Where:

EBIT – Earning Before Interests and Taxes

t – Corporate tax rate

D&A – Depreciation and Amortization

ΔWC – Changes in Working Capital

The first part of the equation [EBIT(1-t)] can also be described as NOPLAT (Net Operating Profit Less Adjusted Taxes). Since D&A is not a cash cost, it is necessary to properly adjust it as such by adding it back. Furthermore, WC dynamics and CAPEX are part of a company's regular business since the first one includes the changes in inventory, receivables, payables as well as other short-term assets and liabilities (excluding debt), while the latest is the direct result from a company's need to sustain the projected evolution of its business.

After the computation of FCFF, and to reach the value of a business, generally described as Enterprise Value (EV), the future FCFF (both the forecasted period and TV) need to be discounted at an appropriate discount tax, that should be the Weighted Average Cost of Capital (WACC) (Mota et al.,2015). Lastly, and in case a company has significant non-operating assets such as assets held for sale, excess cash or marketable securities, these are also added (at their market value) to the EV to obtain a more accurate Firm Value (FV) (Pinto et al., 2015).

To summarize, the final FV is given by:

$$FV = EV + \text{Non operating assets}, \quad \text{with} \quad (3)$$

$$EV = \sum_{n=1}^{t=n} \frac{FCFF_n}{(1 + WACC)^n} + \frac{TV}{(1 + WACC)^n}, \quad \text{with} \quad (4)$$

$$TV = \frac{FCFF_{n+1}}{WACC - g} \quad (5)$$

Where:

FV – Firm value

EV – Enterprise Value

n – Number of years

TV – Terminal Value

FCFF – Free Cash Flow to the Firm

WACC – Weighted Average Cost of Capital

g – perpetual growth rate of cash flows, after specific forecasted period

To arrive to the Equity Value of a firm thereafter, the market value of debt is subtracted to the FV – the advantage of using FV is the fact that cash flows related to debt are not explicitly considered for FCFF hence, in cases where debt is expected to change considerably over time, the FV approach can consume less time (Damodaran, 2012).

2.2.1.2 Weighted Average Cost of Capital

WACC is the most common discount rate used to discount the FCFF, as it includes the weighted average of the different sources of capital used by a company: debt and equity (Larrabee and Voss, 2013). The rate of return that the investors in a company expect is reflected through r_E and r_D , for equity or debt holders (after tax cost), respectively.

$$WACC = \frac{E}{E + D} * r_E + \frac{D}{E + D} * r_D (1 - t) \quad (6)$$

Where:

E or D – market value of Equity or Debt, respectively

$\frac{E}{E+D}$ and $\frac{D}{E+D}$ – Target Capital Structure

r_E – Cost of equity

r_D – Cost of debt

t – Corporate tax rate

As such, to identify WACC, there are several elements that need to be assessed, notably:

Market Value of Equity

A firm's market value of equity is given by the number of outstanding shares multiplied by the stock price – also called market capitalization. This often differs from its book value, with the first regularly being much higher than the latest as the market's reaction to the financial health of a company or a certain announcement can directly impact its market value of equity (Brealey *et al.*, 2017).

Market Value of Debt

Unlike the market value of equity, the market value of debt might not be too different from the book value for healthy firms hence the book value is often used for WACC-computation purposes (Brealey *et al.*, 2017). Nevertheless, if a company constantly holds tradable debt, its market value can be obtained through:

$$\text{Market Value of Debt} = C * \left[\frac{1 - \frac{1}{(1+Kd)^t}}{Kd} \right] + \left[\frac{\text{Total debt value at maturity}}{(1+Kd)^t} \right] \quad (7)$$

Where:

C - Interest expense

Kd- Current cost of debt (%)

t- Weighted average maturity (in years)

Cost of equity

The cost of equity needs to reflect the riskier investment decision. Therefore, the expected return can be summed up as the risk-free rate in addition to an extra return that compensates for the risk (Damodaran, 2012). The most common approach used to reach this cost of equity is the Capital Asset Pricing Model (CAPM) which is a single-factor model where the expected return on the investment is determined by the Levered Beta of the company, reflecting the operational and financial risk of the business, relative to the market risk premium (Damodaran, 2012):

$$r_E = r_f + \beta_L * (R_m - r_f) + CRP \quad (8)$$

Where:

r_E – Cost of equity

r_f – Risk-free rate

β_L – Levered Beta

R_m – Market return

$(R_m - r_f)$ – Market Risk premium

CRP – Country Risk Premium

The risk-free rate is generally the easiest to identify as it is only recognized to long-term government bonds, intermediate-term Treasury notes and Short-term treasury bills (Larrabee and Voss, 2013). Even though the maturity of the risk-free rate should match the cash flow's maturity, this is often impossible to assess, hence the 10-year Government Bonds are frequently used as a benchmark as these are considered the best proxy of a zero risk of default. For less developed countries, with lower debt quality, a Country Risk Premium is usually added to reflect the higher return expected from investors linked to the inherit higher risk associated with the country.

The Levered Beta is an indicator of the volatility risk a company has in relation to the market which implies the higher the Beta, the higher the potential expected return but also a riskier investment. While the business risk is captured by the Unlevered Beta (i.e. the Beta of a

company without any debt), the financial risk is measured through the debt-to-equity ratio, present within levered beta (Mota et al., 2015).

According to Damodaran (2012), the Beta is sometimes estimated using historical stock prices through a regression of stock returns vs. market but, in cases of private firms, Unlevered Beta can be obtained through the average of the Unlevered Betas of an identified peer group which are publicly traded and, thereafter, the appropriate Levered Beta can be obtained, considering the private firm's debt-to-equity target, if disclosed or, alternatively, the industry average capital structure.

$$\beta_L = \beta_U + \beta_U * (1 - t) * \frac{D}{E} - \beta_D * (1 - t) * \frac{D}{E} \quad (9)$$

Where:

β_L – Levered Beta

β_U – Unlevered Beta

β_D – Beta of Debt

t- Corporate tax rate

$\frac{D}{E}$ – Debt-to-equity ratio

Market Risk Premium can be seen as the annual premium demanded by investors for investing in stocks, instead of risk-free securities. According to Koller et al. (2020), this should not be based on a specific foreign or domestic market, but on the global one instead, measured by a global market index such as MSCI World Index. The issue with global indexes is that long-term estimates of past market risk premiums are not readily available hence the best proxy considered is usually S&P 500, whereby the typical range for market risk premium is from 4 to 6%.

Cost of Debt

The cost of debt corresponds to the interest demanded by the providers of debt to a company (e.g. to issue a bond, provide a bank loan), and reflects the company's default risk i.e. as the counterparty borrows more, the default risk and, consequently, the cost of debt will be higher (Damodaran, 2012). In cases where the company only has market debt, its cost of debt will be the same as the coupon rate whereas in cases where the company does not hold market debt, the cost of debt can be obtained through its peers' cost of debt or through:

$$r_D = \frac{\text{Interest Expenses}}{\text{Gross Financial Debt}} \quad (10)$$

It is worth highlighting that the cost of debt considered for the purpose of computing WACC is after-tax, as interest costs, unlike equity-related payments, are tax deductible.

2.2.1.3. Free Cash Flow to Equity (FCFE)

FCFE is, as previously mentioned, the available cash for the Equity-holders and should therefore be discounted at the rate of return demanded by them (r_E). FCFE can be deducted through FCFF as per the following formula (Pinto et al., 2015):

$$FCFE = FCFF - \text{Interest Expenses} * (1 - t) + \text{Debt variation} \quad (11)$$

Where:

t – Corporate tax rate

Debt variation – new debt less debt repayment

Alternatively, it can also be calculated as follows:

$$FCFE = \text{Net income} + \text{D\&A} - \text{CAPEX} - \Delta WC + \text{Net borrowing} \quad (12)$$

Apart from the cash flow considered and the rate used to discount, the remaining part of the process is similar to value a company through FCFF in the sense that a TV should also be computed.

2.2.1.4. Dividend Discount Model (DDM)

When an investor buys a share, there are two sources of income coming from it: the dividend and the difference between the purchase and sell price, although the latest can be negative. DDM is, similar to FCFE, an alternative to FCFF that takes into account the cash available for the shareholders only, i.e. after debt-related expenses, but considering the projected dividends. According to Larrabee & Voss (2013), DDM is used for two alternative purposes: i) Create a theoretical stock price based on the forecasted dividend stream and projected discount rate and ii) Come up with an expected rate of return based on the expected dividends and current market price.

DDM is only focused on dividends paid to the shareholders but the truth is that shareholders can have an indirect income through share buyback programs that companies might use, as they can increase the value of the share and therefore increase the price. Furthermore, DDM has additional issues with companies that choose not to pay out dividends (or have a strategic low payout ratio), ultimately leading to an underestimate of the company (Damodaran, 2015).

$$P_0 = \sum_{n=1}^t \frac{D_n}{(1+r_E)^n} + \frac{TV}{(1+r_E)^n}, \text{ with} \quad (13)$$

$$TV = \frac{D_{n+1}}{(r_E - g)} \quad (14)$$

Where:

P_0 – Current share price

D_n – Dividend expected, from year 1 until t

r_E – Cost of Equity

g – Perpetual growth rate

2.2.2. Multiples

The valuation of a company can also be done through comparison of multiples from other companies within the same industry. This valuation allows to compare the value of the company against the variation of the market, although there are some key points that need to be properly chosen such as the peer group and the multiples, to provide a more accurate view over the industry and company's position (Mota et al., 2015).

The relative valuation, through multiples, is typically used as a complementary methodology to the DCF, due to its subjectivity. Usually, a peer group is identified within the industry composed by a set of companies with similar characteristics (size, growth, risk profile, etc.) to the company that is going to be valued.

The multiples can be divided in three groups (Fernandez, 2001):

1. Based on the company's capitalization (Equity value: E):

With a higher cost of equity implying a lower multiple of earnings.

$$\text{Price Earnings Ratio (PER)} = \frac{\text{Share Price}}{\text{Earnings per share}} = \frac{\text{Market Capitalization}}{\text{Total Net income}} \quad (15)$$

$$\text{Price to book value} \left(\frac{P}{BV} \right) = \frac{\text{Market Capitalization}}{\text{Book value of shareholders' equity}} \quad (16)$$

There are several other multiples under this category but these, especially PER, are the most widely used.

2. Based on the company's value (EV, including both debt and equity):

$$\text{EV to EBITDA} = \frac{\text{Enterprise Value}}{\text{EBITDA}} \quad (17)$$

$$EV \text{ to Sales} = \frac{\text{Enterprise Value}}{\text{Sales}} \quad (18)$$

Although EV / EBITDA is one of the multiples most used, it has some limitations due to the consideration of EBITDA, as the latest does not include the impact of CAPEX (through D&A) nor the changes in WC. According to Mota et al. (2015), EV to EBIT could be used in alternative.

3. Growth-referenced multiples

$$PER \text{ to Growth (PEG)} = \frac{PER}{\text{Growth of EPS in the next few years}} \quad (19)$$

$$\frac{EV}{EG} = \frac{EV/EBITDA (\text{historic})}{EBITDA \text{ Growth in the next few years}} \quad (20)$$

These last type of multiples are more commonly used within growth industries such as health and information technology.

All of the above multiples do not provide that much relevant information, when analyzed on a standalone basis. They should be compared to either the company's own past, market or industry, with the latest being the most relevant.

2.2.3. Contingent Claim Valuation

According to Damodaran (2015), Contingent Claim Valuation is one of the most revolutionary methodologies to value a company as there are cases where the value of an asset might be greater than the PV of the expected cash flows, if these are contingent on a specific event occurring.

This method is mostly used when flexibility to certain events is required and cannot be captured by DCF (e.g. significant discovery within healthcare, development of reserve within O&G being subject to oil prices). According to Koller et al. (2020), there are two approaches:

1. Decision Tree Analysis (DTA) – when there is limited information about the future cash flows and its use, by the management. It is built on DCF valuation scenario and is especially effective to value the flexibility regarding technological risks, such as R&D projects, product launches or plant-decommissioning decisions that are not priced in the market.
2. Real-Option Valuation (ROV) -When we have trustworthy information about the future cash flows and its underlying profitability, ROV can provide better results. This requires

sophisticated option-pricing models and is usually used for businesses with commodity trading such as investments in Oil and Gas (O&G), refining facilities, chemical plants, etc. as the commodity risk is priced in the market.

Even though this approach takes into account the flexibility, it cannot replace DCF since the value of an option is still dependent on the value of the underlying asset (Koller et al., 2020).

The limitations of this model lie on the assumptions made about constant variance and dividend yields, since they are difficult to defend for long-term options. Furthermore, when the asset itself is not traded, the variance, in addition to the underlying asset, need to be assessed thus the result from these option pricing models have much more estimation error linked to them (Damodaran, 2015).

3. Company Overview

With origins dating back to 1933, headquartered in Dhahran and with nearly 76,500 employees at the end of 2018, Saudi Arabian Oil Company (herein the “company”, “Saudi Aramco” or “Aramco”) is the national oil company of Saudi Arabia and was, prior to the IPO held at the end of 2019, wholly owned by the Government of Saudi Arabia. The company’s activities include seeking, exploring, drilling and extracting hydrocarbon materials (Upstream segment) and processing, manufacturing, refining and marketing them (Downstream) – being therefore described as an integrated O&G company as it acts in both parts of the supply chain. While the main part of their revenue (61%) comes from the upstream operations, the downstream part of the process (converting oil and gas into the finished product such as gasoline, natural gas liquids, diesel, etc.) leverages the company competitive position and makes it less exposed to the volatility in oil prices. Aramco’s upstream assets are all located in Saudi Arabia while its downstream assets are located both in Saudi Arabia but also overseas. It is also noteworthy that Saudi Aramco has a track record of efficiently executing some of the world’s major projects within the upstream and downstream in the O&G and petrochemical industries, having executed 22 projects with CAPEX of more than USD 500m each from 2014 to 2018.

Saudi Aramco is the world’s leading oil supplier, producing ca. 13% of the world’s crude oil. Even though being apparently run as a commercially independent company, the Kingdom of Saudi Arabia’s budget is highly dependent on contributions from the company made in the form of dividends, taxes and royalties.

The company owns the monopoly in the upstream sector in Saudi Arabia, having exclusive rights to explore, develop and refine the country’s hydrocarbon resources under a 60-year concession effective as of end of 2017 that may be extended for another 40 years – This means that Saudi Aramco has access to one of the world’s largest proven oil and gas reserves (about 260 billion boe at the end of 2018 vs. 13.6 million boe/day produced by Saudi Aramco in 2018) securing proved reserves life of 52 years if the same level of production is kept (substantially longer than the 7 to 19 years of the five major international oil companies: ExxonMobil, Shell, Chevron, Total and BP at the end of 2019).

As of 2017, and in connection with the concession, Aramco is obliged to sell certain refined products and crude oil at regulated prices which are typically fixed below cost in the country – Nonetheless, the government has also implemented a price equalization measure in which it compensates Aramco for the lost revenue. The hydrocarbons for which domestic sales are subject to regulations are: crude oil, natural gas (including ethane), NGL (propane, butane and natural gasoline) and other refined products such as diesel, gasoline, heavy fuel oil and kerosene.

On December 11th, 2019, Saudi Aramco officially listed 1.5% of its shares (total of 3 billion shares) in the Saudi's Stock Exchange Tadawul. The IPO listing was firstly announced back in 2016 by Crown Prince Mohammed bin Salman as part of his Saudi Vision 2030 transformation program aiming to raise cash for the country to carry out economic reforms and partly to reduce the country's dependence on oil and invest in other industries.

Aramco was first listed at USD 8.53 per share, raising a total of USD 25.6 billion but, with the stock jumping by 10% to USD 9.38 on that same day, the company's market value reached USD 1.9 trillion surpassing the largest IPOs until then, namely Apple (USD 1.17 trillion) and Microsoft (USD 1.14 trillion). Still, the stock continued to surge on the second day after going public, rising up to USD 10.32 per share and reaching the Crown Prince's long-term targeted market value of USD 2 trillion.

4. Industry Overview

The O&G industry is one of the most profitable in the world, being the largest sector in the world in terms of value (ca. USD 2 trillion) and contributing to a significant portion of some countries' GDP such as Saudi Arabia (estimated at ca. 33% of GDP and 80% of exports in 2018).

Saudi Arabia is the largest and most-profitable oil exporter in the world and controls about one-third of OPEC's (Organization of the Petroleum Exporting Countries) total oil reserves playing therefore a leading role in the organization which was created in Baghdad in 1960 (currently headquartered in Vienna) with the goal of securing fair and stable prices for petroleum producers. The organization has 13 countries as members which accounted for approximately 44% of the global oil production in 2018 and 81.5% of the world's proven oil reserves – This gives OPEC a great influence on global oil prices as the organization can decrease the level of supply by agreeing on reducing production.

The demand for crude oil increased at a CAGR of 0.9% between 2000-2018 and was expected to grow at 0.8% from 2018-2030. Over time, crude oil demand has been following GDP growth trend, although at a slower pace in recent years due to a number of factors such as: increase use in alternative energy sources, more efficient use of crude oil and the electrification of vehicles. Nevertheless, the key drivers of demand for oil remain unchanged, with oil being the world's leading energy source accounting for 32% of the global energy demand in 2018.

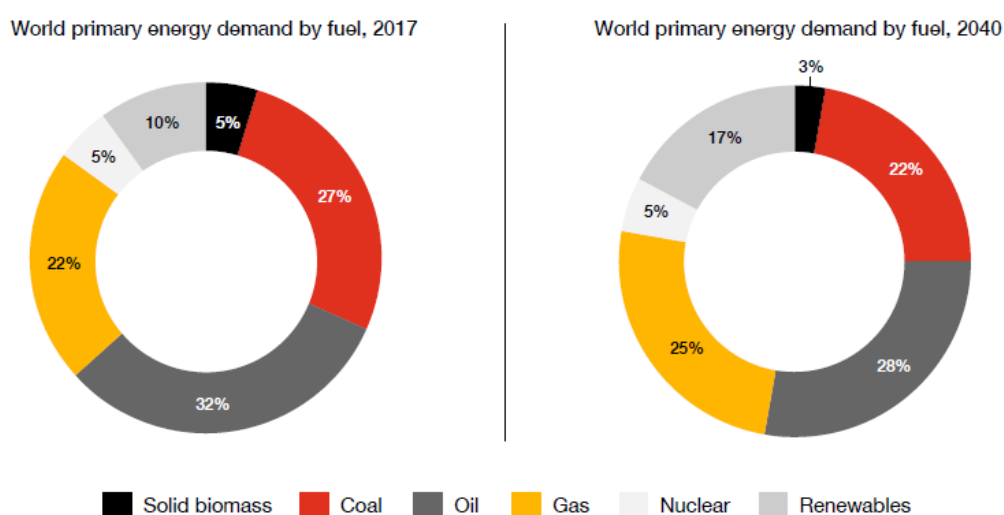


Chart 4.1- World primary energy demand by fuel in 2017 and 2040.

Source: PWC Oil and Gas trends 2019

Global GDP grew, from 2008 to 2018, at a CAGR of 3.2% and is expected to continue this positive trend at 2.9% CAGR from 2018-2030. The growth has been more driven by non-OECD countries (5.1% vs. 2.1% in OECD countries).

The O&G sector can be divided in three segments: Upstream, Midstream and Downstream. An integrated player is thus one that acts within more than one part of the supply chain.

The Upstream segment is where Exploration and Production (E&P) companies are included and their main mission is to find reservoirs and drill oil and gas wells. In the middle of the supply chain there are the Midstream companies who are responsible for the transportation from the wells to refineries and, finally, at the end of the supply chain, the firms acting within the Downstream segment are responsible for the refining and sale of the finished products such as gasoline, jet fuel and heating oil.

The O&G players, especially the ones acting within the Upstream segment, are highly exposed to the price crude oil since they basically sell at the market price. The commodity price had been continuously growing from the beginning of 2016 - reaching its highest price on March 10th, 2018, at USD 86.29, but it started to lose value at the end of 2018 due to, amongst other reasons, increased production in the US combined with other political matters in the US such as the Trade War with China. Factors such as supply disruptions or a recession can have a positive or negative impact on the price, respectively.

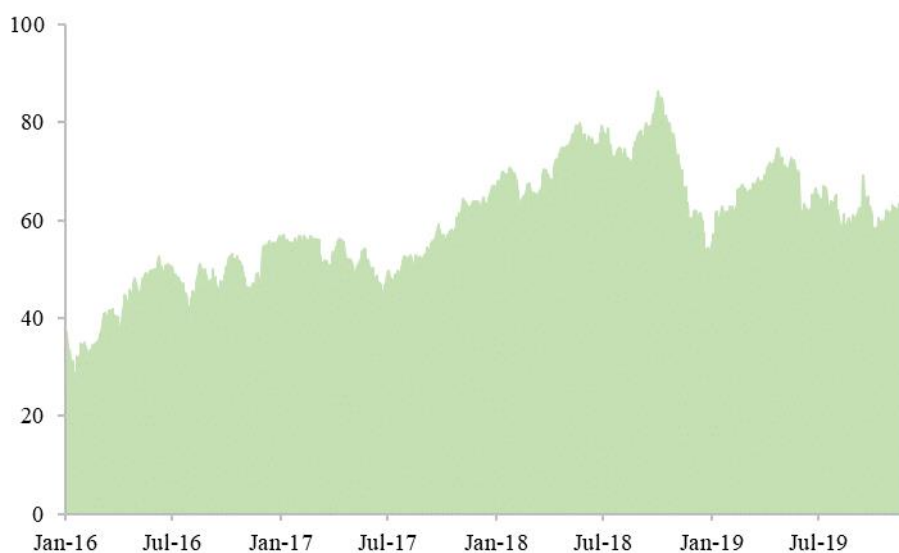


Chart 4.2 - Brent Crude Price from 2016 to end-2019, in USD.
Source: NASDAQ

5. Financial Analysis

The Financial Analysis of the company took into account the data that was included in the Prospectus released prior to the IPO held at December 11th, 2019.

Revenue and Profitability

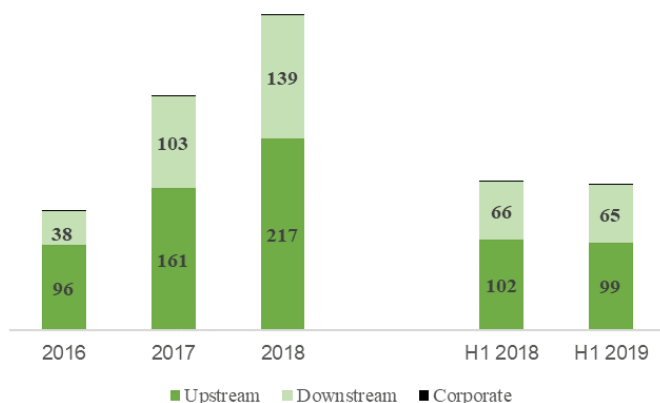


Chart 5.1 - Revenues' evolution per segment, in USD Billion

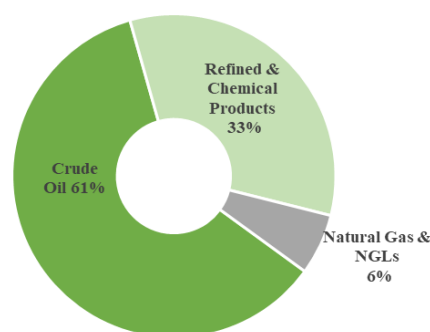


Chart 5.2 - 2018 external revenue split per product type

To be noted: Total revenues in 2016 includes the net effect from royalties payable to the Government as, prior to 2017, these were directly deducted from revenue rather than accounted for as an expense (as they are currently treated). Split between each segment for 2016, without this impact, was not available.

Sales increased substantially in 2017 by 96% to USD 264bn (or by 63.5% if excluding the deduction of royalties in 2016) and yet again in 2018 by 35% (to USD 356m) largely driven by an increase in average realized sales price per barrel of crude oil as the average price of the commodity increased by 30% in 2017 (from USD 40.7 to USD 52.8) and 33% in 2018 (to an average of USD 70.1) – a factor that was further positively impacted by the price equalization measure that was implemented from 2017 onwards. As 61% of Aramco's revenues (in the last three periods) comes from the upstream segment, Aramco is highly exposed to the market price volatility but this is partly mitigated by Aramco's downstream segment combined with low production costs.

Revenue was broadly stable in H1 2019 despite a slight decrease in crude oil price (-USD 3 to USD 66.1). It is noteworthy that the company's quarterly operating performance is also conditioned by seasonality since, as an example, there is increased natural gas demand for the utilities sector during summer in Saudi Arabia and also increased demand for diesel, gasoline and jet fuel around major holidays.

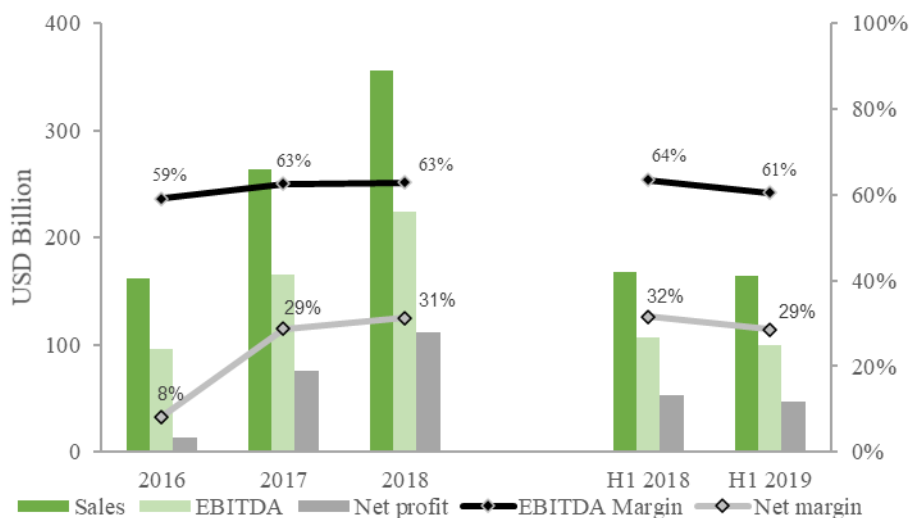


Chart 5.3 – Historic evolution of operating profitability

For the O&G companies, profitability is often measured by EBITDAX (i.e. EBITDA before exploration expenses) – For Aramco in specific due to limited exploration expenses, the EBITDAX margin is largely the same (standing at 64% in both FY17 and FY18) and no impact on the half-year.

Within the company's cost base, the most material are the production royalties payable to the government (with an average weight of 15% over turnover) and the purchases (14% on average) that consist primarily of refined products, chemicals and crude oil bought from third parties for use in Aramco's downstream segment but also to meet demand in Saudi Arabia when the production of a certain product might be insufficient.

Royalties are based on production value - As of September 2019, an amendment to the concession was made to include the following changes based on average daily quotes for Brent crude, relative to the production of crude oil and condensates:

- i) Decrease of royalty rate to 15%, from 20%, to value of production up to USD 70 per barrel;
- ii) Increase marginal royalty rate to 45% (from 40%) on Brent prices between USD 70-100;
- iii) Increase to 80% (from 50%) the royalty rate, when Brent crude is above USD 100.

Regarding the royalty rate to be paid on the company's production of natural gas, ethane and NGLs (excluding volumes used for the upstream segment), the royalty rate is flat at 12.5% -

Nonetheless, with the amendment, and in order to increase gas production to meet Saudi Arabian's needs, the government might decide not to collect royalties. In 2018, the Kingdom actually decided to give Saudi Aramco a 5-year grace period (further extended by another 5 years in 2019) on condensates production.

Apart from Royalties, Income tax is also an important cost to Aramco and a source of income to its shareholders – the Saudi Arabian Government. As of January 2017, the Kingdom of Saudi Arabia introduced a new multi-tiered structure for hydrocarbons producers where, for companies with capital investment above USD 100m such as Aramco, income tax rate for the upstream segment was decreased from 85% to 50%.

Despite these substantial costs, and noting the oil prices surging until 2018, Aramco was able to further strengthen its operating performance being ultimately considered the world's most profitable company in 2018, with a net profit of USD 111bn implying a net profit margin of 31% that year.

Liquidity Position

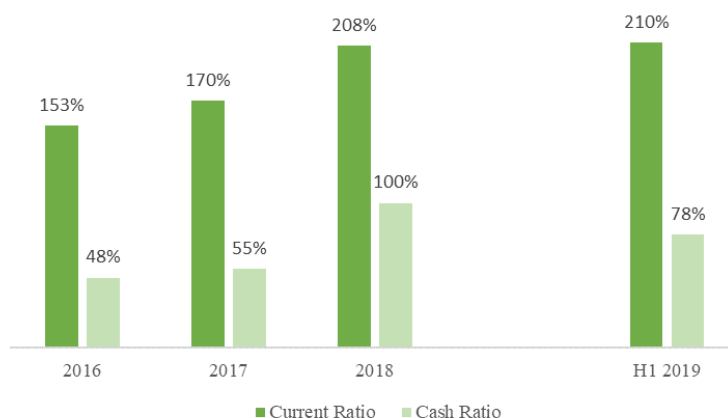


Chart 5.4 – Evolution of liquidity ratios

Current ratio has been historically well above 1x, meaning that Saudi Aramco can comfortably cover its short-term obligations from its current assets. However, this may also indicate that there is an inventory build-up. Nevertheless, it is also noted the cash evolution over time whereby Saudi Aramco could cover all of its current obligations with its accumulated cash in 2018.

Working Capital needs

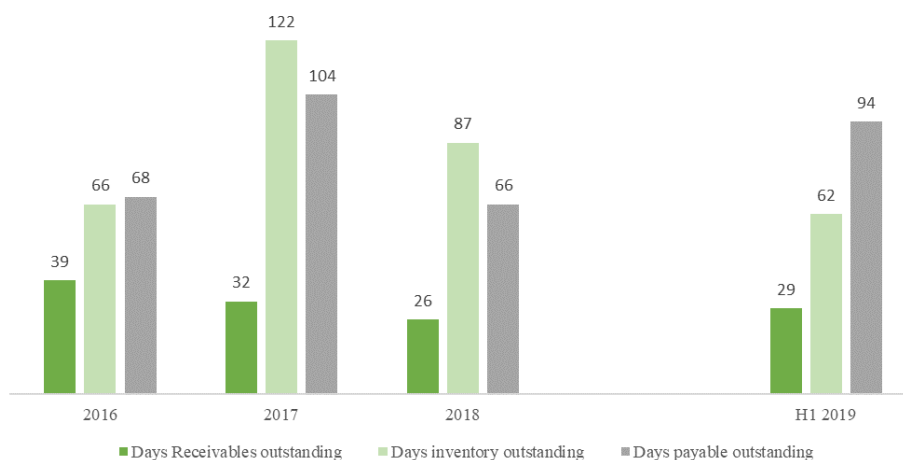


Chart 5.5 - Evolution of working capital

Working Capital management is a crucial component for companies as it can lead to cash freed up if the daily operations are well managed. Saudi Aramco has a comfortable position in terms of credit from its suppliers in comparison to its days' receivables but, most likely due to the exposure to the O&G prices', inventory build-up can occur in times where prices are at high levels. This was observed in 2017 and 2018 where days inventory were significantly above days payable, therefore leading to less available cash.

Capital Structure

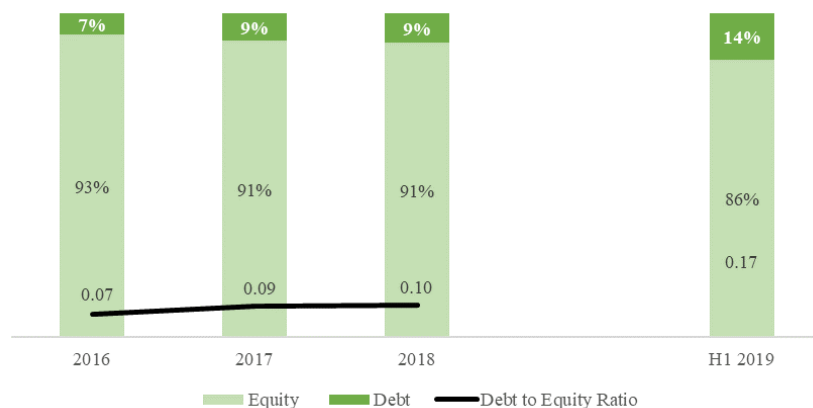


Chart 5.6 - Capital Structure evolution with book values (2016 - H1 2019)

Despite acting within a CAPEX intensive industry, Aramco maintains a capital structure underpinned by a rather strong level of equity. At H1 2019, the increased dividend combined with increased use of external debt, has led to an increase of the debt to equity ratio at 0.17x – still rather conservative. Saudi Aramco defined a target for its net gearing¹ to be between 5%

¹ Defined as (gross financial debt – cash) / (gross financial debt – cash + equity)

to 15% (2.4% as of H1 2019 or -8.6% in FY18), which is considerably lower than all of the five major Oil International Companies (between 12% to 31%).

Operating Returns

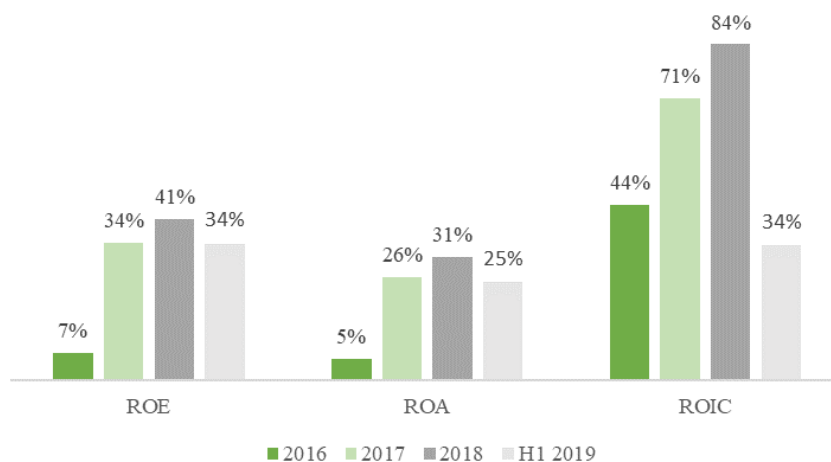


Chart 5.7 – Operating return ratios' evolution

The net profit of Saudi Aramco has been increasing significantly over the last years from USD 13bn in 2016 to USD 111bn in 2018, influenced by i) a strong increase in revenues (on the back of high O&G prices) and ii) reduction of corporate tax rate in 2017 – the latest replaced by an increased dividend to the government.

Aramco was described as the world's most profitable company in 2018 and the positive evolution of the operation return ratios over the last years is noticeable. Nevertheless, by H1 2019, all of them presented a negative trend – This is due to the fact that the company's operating profit in H1 2019 was below H1 2018 due to not only a decrease in O&G prices but also due to recent years' strong business momentum and therefore increased capital invested. Nevertheless, it is noteworthy that H2 is usually stronger and the variance vs. H1 2018 is not dramatic. All in all, even with lower operating return ratios, they are still rather strong for any corporate.

6.Valuation

The models that will be used to assess the value of Saudi Aramco will be the Discounted Cash Flow and Relative Valuation, given that the first is essentially the basis for all valuation models. Contingent Claim Valuation will not be used given that: i) it has much more estimation error, especially when the asset itself is not traded, due to the assumptions that have to be made related to constant variance; ii) the fact that Saudi Aramco is not particularly subject to the exploration of new reserves as it already has access to one of the world's largest proved reserves that can

secure its production for at least 52 years and iii) Aramco can have a significant impact on the O&G prices due to its position as leader of the OPEC.

All the assumptions made are based on information available at the time of the IPO (December 2019) and consider financial information up until June 2019.

6.1. Assumptions of Saudi Aramco's Forecasts

6.1.1. Income Statement

As observed in the past, Saudi Aramco is mainly exposed to the Brent Crude oil price. In line with this, the model is built under the assumption that revenues will follow the fluctuation of O&G prices. For 2019, this means a decline in revenue by 2% assuming that Aramco will keep its performance as in H1 (-2% vs. average oil price down by 6%). Thereafter, it was assumed that, with OPEC influence, oil prices will move towards stabilization over the next years.

Despite the assumption of stable oil prices after 2019, 2020 revenue is adjusted by the purchase agreement made by Aramco on March 2019, to acquire 70% of SABIC (one of the world's largest petrochemicals manufacturers based in Saudi Arabia) for USD 69.1bn with the acquisition expected to close in the first half of 2020. SABIC had, in 2018, revenues of USD 45bn and net profit of USD 8.5bn which, despite not that material when compared to Saudi Aramco actual turnover of USD 356bn in 2018 or net profit of USD 111bn, is still expected to have a material impact from 2020 onwards and was therefore considered in the forecast.

After forecasting revenues, the gross profit margin was modeled at 82.1% (last 3-years average), supported by Aramco history in 2016 vs. 2015 where the company improved its gross profit margin despite a decrease in revenue – this is reasonable to assume given Aramco's low production cost – As such, the models counts with the maintenance of a high gross profit margin even in a year of contraction expected such as 2019 and regardless of the slight increased purchases observed in H1 2019.

With regards to SG&A, and noting that these include royalties to the Kingdom of Saudi Arabia that were adjusted from 2017, an average of the last 2 years was considered as the relative weight for such expenses (18.8%).

No specific assumption was made with regards to the exploration expenses as these are not material to Saudi Aramco since the company has access to one of the world's largest proved reserves and, unlike its peers, does not need to spend as much on exploration to keep producing – these costs are therefore also incorporated within SG&A.

Depreciation and Amortization are expected to maintain an average of 6% yearly depreciation in relation to CAPEX at the beginning of the year, in line with last 3 years and taking into account increased operational assets from 2020 with the acquisition of SABIC.

No assumption regarding other pre-tax non-operating items was made as these are considered non-recurring. Additionally, for the income from associates and joint-ventures the same result as of 2018 was assumed.

In terms of interest expenses, they were modeled by the implied interest rate of 3.21% as of H1 2019, supported by historically interest expenses weighting around 3% of gross debt as well. For the financial items, and given that the value is non-material (weighting around 0.2% of revenues in 2018 or below that level in previous year), no value was forecasted.

Finally, with regards to the corporate tax rate and given that this was adjusted by the Kingdom of Saudi Arabia in 2017 whereby all resident entities operating in the oil and hydrocarbon production sector and with capital investment of more than USD 100m would be subject to a tax rate of 50% (down from 85%), a 50% income tax rate was applied.

6.1.2. Working Capital

The working capital of Saudi Aramco is composed of inventories, trade receivables and other current assets including other receivables and due from the government netted by operating liabilities such as trade payables and obligations to the government.

Accounts receivable were modelled in function of days receivable against revenues while other current assets took into account the historical weight on sales. Inventory and trade payables were both forecasted based on days of inventory outstanding and trade payable days' against the cost of goods sold. Short-term liabilities were, similar to other current assets, modelled in function of the relative weight to revenues.

6.1.3. CAPEX

As Aramco is less dependent on exploration to produce and sell, the company's investment in CAPEX was modelled based on the average of the historical weight of CAPEX vs. revenues (10%). It is noted that the acquisition of the 70% stake in SABIC was also taken into account.

6.1.4. Dividends

In terms of dividends to be paid, Saudi Aramco provided guidance on the dividend that would be paid for the rest of 2019 which was therefore summed up to the dividend already paid in H1 2019. From 2020 onwards, Aramco announced that it would intend to pay at least USD 75bn until 2024.

6.1.5. Debt related Cash Flows

The bonds issued in April 2019 under the GMTN program were taken into account in the model and the repayment of the only financial instrument that is due until 2023 (bond of USD 1bn) was also included. All the other credit facilities with no maturity specified are assumed to be rolled over.

6.2. Cost of Capital

In order to calculate the value of Saudi Aramco, the relevant discount rate needs to be computed. For the FCFF method, WACC will be used and obtained via formula (6) meaning the target capital structure, the cost of debt and cost of equity will be needed.

6.2.1. Capital Structure

Even though the company historically has a rather strong level of equity, with a debt to equity booked value ratio of only 0.1x at the end of 2018, it is noted that Saudi Aramco has been increasing the use of external debt. As such, the targeted capital structure considered as a best proxy was obtained via the median of its peers who are also vertically integrated but publicly traded, namely the five major international oil companies (ExxonMobil, Shell, Chevron, Total and BP).

The D/E obtained and used in valuation, as of 30th June 2019, was therefore 0.62.

6.2.2. Cost of Debt

Saudi Aramco has a rather diversified funding base with access to Revolving Credit Facilities and short-term banking loans, export credit agencies, a Sukuk (Sharia-compliant bond-like) and Global Medium Term Note (GMTN) programs among others. The company issued USD 12bn of senior unsecured notes in April 2019 under the GMTN program comprising five tranches that go from 3 years (with 2.75% coupon) to 30 years (4.375% coupon). Hence, in order to simplify and noting that the company has a rather low probability of default proved by the access to such long-term maturities at the mentioned coupons, the cost of debt was obtained by dividing annualized interest expenses by gross debt as of June 2019. Cost of debt obtained was therefore 3.21%.

6.2.3. Cost of Equity

Risk-free Rate (Rf)

The reference risk-free rate is often the 10-year government bond as these are considered the best proxy for the absence of investment risk. Since Saudi Aramco makes a substantial amount of its revenue from exports and the oil is denominated in USD, the US 10-year government bond was considered (yield of 2.07% as of June 2019) as reference and a Country Risk Premium (0.68%) was added to reflect the higher risk in Saudi Arabia vs. US – It is noteworthy that the

CRP takes into account the A1 rating of Saudi Arabia (by Moody's / unchanged since 2016) and was obtained from Damodaran's database who studied all CRPs for all countries. Additionally, it is noted that currency risk is not an issue as the Saudi riyal (SAR / Saudi Arabian domestic currency) is pegged to USD with a flat exchange rate of 3.75 since 1986 and interest rates and inflation broadly tracking the US.

Market Risk Premium

Market Risk Premium reflects, as above-mentioned, the additional return demanded by investors to compensate the investments in the riskier instruments. Even though ideally a global market index should be used, long term estimates are often not readily available.

As such, and following the same rationale as for the risk-free rate, i.e. the fact that the domestic currency is pegged to the dollar and the economy is correlated, the expected market return of the index S&P500 was used as proxy. Using data from June 2004 to June 2019 the Annualized S&P Return was 8.2%, leading to a market risk premium of 6.13%, slightly above but broadly in line with the 4 to 6% usual MRP.

Levered Beta

The peer group identified (large O&G players, notably: ExxonMobil, Shell, Chevron, Total and BP) acts within the same parts of the supply chain of O&G as Saudi Aramco and should therefore present a similar operating beta (i.e. unlevered beta). The median of the unlevered beta and hence the one used for the valuation was 1.14.

Even though Aramco has a solid credit profile with an equity ratio of around 90% and a healthy cash position, the assumed targeted capital structure considers that the company will increase its debt position. Therefore, in order to obtain Levered Beta via formula (9), Beta of Debt was deducted from cost of debt [similar to cost of equity via formula (8)].

$$3.21\% = 2.07\% + \beta_D * (8.2\% - 2.07\%) + 0.68\% \Leftrightarrow$$

$$\Leftrightarrow \beta_D = 0.1 \tag{8}$$

Taking into account the above assumptions, and the corporate tax rate of 50%, as explained in the forecast assumptions' section, the Leveraged Beta can be calculated through:

$$\beta_L = 1.14 + 1.14 * (1 - 0.5) * 0.62 - 0.1 * (1 - 0.5) * 0.62 = 1.46 \tag{9}$$

The Levered Beta of 1.46 (i.e. above 1) implies that Aramco is 1.46x more volatile than the overall market and its stock price is therefore expected to experience more swings.

Final Cost of Equity

With some of the above outputs, we are able to retrieve Saudi Aramco's cost of equity through:

$$r_E = 2.07\% + 1.46 * (8.2\% - 2.07\%) + 0.68\% = 11.7\% \quad (8)$$

6.2.4. WACC

With all the above variables, the Weighted Average Cost of Capital of Saudi Aramco could be obtained via:

$$WACC = 0.62 * 11.7\% + 0.38 * 3.21\% * (1 - 0.50) = 7.9\% \quad (6)$$

6.3. Discounted Cash Flow Approach

6.3.1. Free Cash Flow to the Firm

After forecasting the necessary inputs, it is possible to calculate the FCFF that will, in combination with WACC, be used for the final Enterprise Value and, lastly, Equity Value.

Table 6.1 - Saudi Aramco projected FCFF in USD bn (2019-2023) vs. 2018

FCF	2018	2019F	2020F	2021F	2022F	2023F
EBIT	\$ 212.53	\$ 206.02	\$ 226.87	\$ 229.50	\$ 234.51	\$ 238.41
Tax rate	47.80%	50.00%	50.00%	50.00%	50.00%	50.00%
NOPLAT	\$ 110.95	\$ 103.01	\$ 113.43	\$ 114.75	\$ 117.26	\$ 119.21
Dep	\$ 11.02	\$ 14.41	\$ 15.64	\$ 19.08	\$ 20.29	\$ 21.49
Capex	\$ (35.14)	\$ (34.88)	\$ (38.37)	\$ (39.33)	\$ (40.31)	\$ (41.12)
Inv WC	\$ (5.32)	\$ (2.36)	\$ (0.79)	\$ (0.71)	\$ (0.40)	\$ (0.35)
FCFF	\$ 81.51	\$ 80.18	\$ 89.91	\$ 93.79	\$ 96.83	\$ 99.23

In 2019, FCFF is slightly below 2018 given the experienced contraction in oil prices in H1 2019. Nevertheless, with SABIC consolidation and expected stabilization of prices, Aramco is expected to recover thereafter.

Perpetual growth rate used in the forecasted cash flows to determine the Terminal Value was 2% corresponding to the inflation rate of Saudi Arabia expected from 2024 onwards. The mentioned rate was used since there is no clear breakdown of revenue per market and main economies in Asia as well as the US presented inflation rates in the same range.

Using the previously obtained WACC of 7.9% to discount the FCFF obtained, the final Enterprise value is USD 1.52bn, implying a EV/EBITDA of 6.86x. From this value, it is possible to obtain the Equity Value if adjusted by the non-operational items.

For Saudi Aramco, these comprise:

- Financial debt of USD 27bn and excess cash of USD 48.8bn, equivalent to a net cash position of USD 21.8bn;

- Investments in securities worth USD 4.6bn;
- Other assets of USD 3.5bn mainly referring to home loans to employees or loans to associates and Joint-ventures;
- Post-employment benefit obligations of USD 6.2bn.

It is noted that investments in Joint Ventures and Associates is not added back as the companies are already accounted for using the equity method. After the above adjustments, Equity Value can be deducted, being equivalent to USD 1.54bn which, taking into the account the number of shares of Aramco (200bn shares, out of which 3 billion issued under the IPO), leads to an Equity Value per share of USD 7.68, vs. initial price of USD 8.53.

6.3.2. Free Cash Flow to Equity

To arrive to the Equity Value via FCFE, the FCFE is adjusted by the debt elements as per formula (11) and discounted at the cost of equity (11.7%) previously computed, including the terminal value.

Table 6.2 - Projected FCFE in USD bn (2019-2023) vs. 2018

FCF	2018	2019F	2020F	2021F	2022F	2023F
FCFF	\$ 81.51	\$ 80.18	\$ 89.91	\$ 93.79	\$ 96.83	\$ 99.23
Interest expenses * (1-t)	\$ 0.41	\$ 0.74	\$ 0.74	\$ 0.74	\$ 0.72	\$ 0.72
Debt Variation	\$ 6.33	\$ 19.08	\$ -	\$ -	\$ (1.00)	\$ -
FCFE	\$ 88.25	\$ 100.00	\$ 90.65	\$ 94.53	\$ 96.56	\$ 99.95

As FCFE is adjusted by new net borrowings, the outcome is slightly above the FCFE in 2018 and 2019 on the back of new debt issued. Nevertheless, due to the high return expected (r_E), the final Equity Value is USD 982m using the same perpetual growth rate, leading to a price per share of USD 4.81.

6.3.3. Dividend Discount Model

Assuming that the company will pay the same dividend for the last quarter of 2019 as for the third, the total dividend to be paid relative to the year 2019 will be USD 73.4bn and to be increased to USD 75bn from 2020 to 2024, in line with Aramco's guidance on its intention to pay at least USD 0.09375 per share quarterly. As the DDM uses the future dividends as foundation, the future dividends are discounted at the cost of equity, with the same perpetuity growth assume in the previous two models.

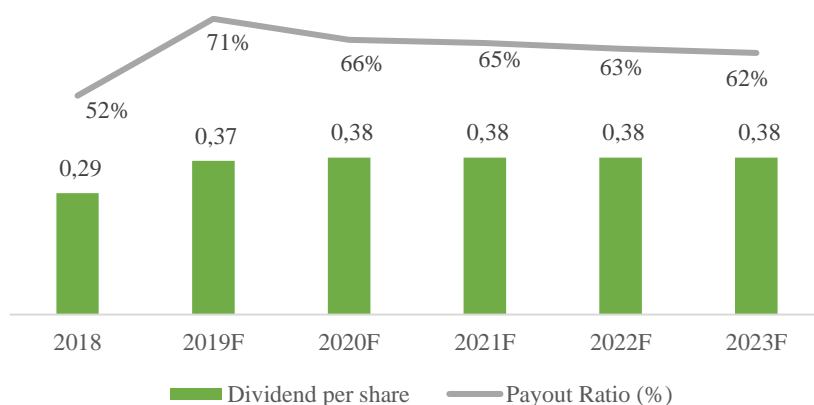


Chart 6.1 - Projected DPS and Payout Ratio (2019-2023) vs. 2018

As the method only takes into account the future dividends expected, the value per share obtained is USD 3.68.

6.4. Relative Valuation

The peers chosen to value Saudi Aramco via Relative Valuation were the five major international oil companies. Despite knowing that Aramco can be considered as an outlier in the industry due to its comfortable access to proved oil reserves unlike its peers, all of the companies act within several parts of the O&G supply chain.

Table 6.3 – Relative Valuation

	P/E	EV/EBITDA
Exxon Mobil	18.1x	8.1x
Shell	13.1x	5.7x
Chevron	16.2x	6.3x
Total	13.8x	5.1x
BP	15.8x	5.1x
Median	15.8x	5.7x
Average	15.4x	6.1x
Saudi Aramco:		
EV		1,259
EQV	1,642	1,282
Share Price	8.21	6.41

As one can see, the result taking the median of the peers' multiples, produces quite different outcomes in terms of Aramco's final share price, at USD 8.21 via P/E and USD 6.41 via EV/EBITDA. Even though the result via P/E is closer to the DCF valuation through FCFF, the

EV/EBITDA of the peers is significantly below the one assessed previously. This is likely due to the exceptional high EBITDA of Saudi Aramco vs. its peers.

6.5. Results Overview

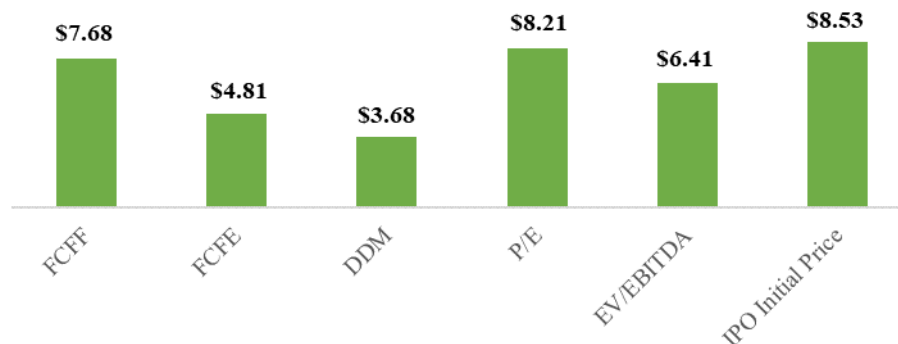


Chart 6.2 - Overview of final share price through the different valuation methods vs. actual Initial price

Analyzing all the outputs from the different valuation methodologies used throughout the Equity Research, the average share price is USD 6.77 (excluding DDM), i.e., 21% lower than the initial set price. The highest valuation was obtained via Relative Valuation (P/E) thanks to Aramco's solid profit, but it was still 4% lower than the initial share price of USD 8.53 leading to a consensus regarding a scenario of overpricing.

6.6. Sensitivity Analysis

Sensitivity analysis was performed based on the two key drivers in the FCFE valuation methodology: the discount rate (WACC) and the perpetuity growth rate.

Table 6.4 - Sensitivity analysis (FCFE to variation in WACC and Perpetual growth rate)

		Perpetuity Growth rate						
		\$ 7.68	0.50%	1.00%	1.50%	2.00%	2.50%	3.00%
WACC	9.40%	5.71	5.94	6.20	6.49	6.82	7.20	7.65
	8.90%	5.95	6.20	6.49	6.83	7.21	7.66	8.19
	8.40%	6.21	6.50	6.83	7.22	7.67	8.20	8.84
	7.90%	6.51	6.84	7.23	7.68	8.21	8.85	9.64
	7.40%	6.85	7.24	7.69	8.22	8.86	9.65	10.63
	6.90%	7.24	7.69	8.23	8.87	9.65	10.64	11.92
	6.40%	7.70	8.23	8.88	9.66	10.65	11.93	13.65

As visible in the table above, the valuation is highly sensitive to the variables chosen given that only a variation of 0.50 percentage points was considered in each but the share price could

fluctuate between USD 5.71 and USD 13.65. Nevertheless, it is noted that the company's actual share price set at the time of the IPO was USD 8.53 which can simply mean that assumptions on the perpetuity growth rate were more optimistic at more than 2.5% vs. 2% considered in the model presented above or the weighted average cost of capital was assessed to be lower than our calculation.

Overall, a slightly higher sensitivity to WACC is noted as well as a tendency towards overvaluation.

7. Conclusion

The current project aimed to evaluate the value of the world's most profitable company: Saudi Aramco at the time of its IPO (December 11th, 2019) to be able to compare to the price at which the company was first listed (USD 8.53) and conclude whether the price was fair, or a scenario of under or overpricing occurred.

Different valuation methods were used, namely Discounted Cash Flow and the Relative Valuation in order to build a sustained conclusion. Within DCF, the final share price obtained was i) USD 7.68 via FCFF; ii) USD 4.81 via FCFE and iii) USD 3.68 via DDM whilst in Relative Valuation a share price of USD 8.21 was obtained from Price to Earnings ratio and USD 6.41 from EV/EBITDA based on the peer group identified (the five major international oil companies: ExxonMobil, Shell, Chevron, Total and BP). The multiple outcomes and its noticeable difference can be explained by the significant EBITDA that the company has, with a 62% average EBITDA margin. Nevertheless, it is noted that all results point out to an overpricing of the share which did not impact the success of the IPO, likely due to the limited investment opportunities in the country coupled with the solid profile of Saudi Aramco.

Since there are variables that have a significant impact in the final valuation of the company, a sensitivity analysis was performed on the FCFF model, taking into accounts the weighted average cost of capital (WACC) and the perpetuity growth rate and it was noted that a minimal change either in the perpetual growth rate or WACC could lead to overpriced scenarios pointing towards a more optimistic approach used by the analysts when setting the initial share price of Saudi Aramco, with a lower cost of capital and/or a higher perpetuity growth rate.

The main obstacles in assessing the value of such company were: i) the limited information disclosed, since historical financial performance prior to 2016 was not publicly available (only data used was the one present in the Prospectus released by the time of the IPO) and ii) the assumptions used in the forecast which were largely based on the Prospectus but also research from the industry situation at the time. This leads to a certain margin of error as usually the analysts who are responsible for the price settlement have access to private information.

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9. Appendix

A. Peer Group: Capital Structure and Unlevered Beta

	D/E	Unlevered beta
Exxon Mobil	0,82	1,16
Shell	1,08	0,80
Chevron	0,62	1,14
Total	0,59	0,70
BP	0,57	1,61
Median	0,6x	1,1x
Average	0,7x	1,1x

B. Income Statement (Historical)

(USDm)	2017	2018
Revenues	264 176,00	355 940,00
<i>Growth (%)</i>	<i>63,5%</i>	<i>34,7%</i>
Cost of goods sold	-48 815,00	-65 370,00
Gross profit	<i>81,5%</i>	<i>81,6%</i>
SG&A and other operating expenses	-50 078,00	-66 639,00
<i>Relative Weight (%)</i>	<i>19,0%</i>	<i>18,7%</i>
EBITDA	165 283,00	223 931,00
D&A	-9 839,00	-11 023,00
<i>Relative Weight (%)</i>	<i>3,7%</i>	<i>3,1%</i>
Operating income (EBIT, adjusted)	155 444,00	212 908,00
<i>Relative Weight (%)</i>	<i>59%</i>	<i>60%</i>
Income from associates & joint ventures	-255,00	-377,00
EBIT plus income from associates & JVs	155 189,00	212 531,00
Other pre-tax non-operating items	2,00	234,00
Interest Expenses	-557,00	-789,00
Other Financial Items	416,00	796,00
Pre-tax income	155 050,00	212 772,00
Taxation	-79 152,00	-101 701,00
<i>Effective Tax Rate (%)</i>	<i>51,05%</i>	<i>47,80%</i>
Post-tax income	75 898,00	111 071,00
Minority interests	379,00	86,00
<i>Minority Weight (%)</i>	<i>0,50%</i>	<i>0,08%</i>
Net income	75 519,0	110 985,0
Dividends	50 093,0	58 000,0
Payout Ratio	66%	52%

C. Income Statement (Forecast)

(USDm)	2019F	2020F	2021F	2022F	2023F
Revenues	348 821,20	383 703,32	393 295,90	403 128,30	411 190,87
<i>Growth (%)</i>	-2,0%	10,0%	2,5%	2,5%	2,0%
Cost of goods sold	-62 438,99	-68 682,89	-70 399,97	-72 159,97	-73 603,17
Gross profit	82,1%	82,1%	82,1%	82,1%	82,1%
SG&A and other operating expenses	-65 578,39	-72 136,22	-73 939,63	-75 788,12	-77 303,88
<i>Relative Weight (%)</i>	18,8%	18,8%	18,8%	18,8%	18,8%
EBITDA	220 803,82	242 884,20	248 956,31	255 180,21	260 283,82
D&A	-14 411,58	-15 639,81	-19 076,64	-20 291,82	-21 493,08
<i>Relative Weight (%)</i>	4,1%	3,80%	3,80%	3,80%	3,80%
Operating income (EBIT, adjusted)	206 392,24	227 244,39	229 879,66	234 888,39	238 790,74
<i>Relative Weight (%)</i>	59%	59%	58%	58%	58%
Income from associates & joint ventures	-377,00	-377,00	-377,00	-377,00	-377,00
EBIT plus income from associates & JVs	206 015,24	226 867,39	229 502,66	234 511,39	238 413,74
Other pre-tax non-operating items	0,00	0,00	0,00	0,00	0,00
Interest Expenses	-1 479,84	-1 479,84	-1 479,84	-1 447,74	-1 447,74
Other Financial Items	0,00	0,00	0,00	0,00	0,00
Pre-tax income	204 535,40	225 387,55	228 022,82	233 063,65	236 966,00
Taxation	-102 267,70	-112 693,77	-114 011,41	-116 531,83	-118 483,00
<i>Effective Tax Rate (%)</i>	50,00%	50,00%	50,00%	50,00%	50,00%
Post-tax income	102 267,70	112 693,77	114 011,41	116 531,83	118 483,00
Minority interests	79,18	87,26	88,28	90,23	91,74
<i>Minority Weight (%)</i>	0,08%	0,08%	0,08%	0,08%	0,08%
Net income	102 188,5	112 606,5	113 923,1	116 441,6	118 391,3
Dividends	73 400,0	75 000,0	75 000,0	75 000,0	75 000,0
Payout Ratio	72%	67%	66%	64%	63%

D. Balance Sheet (Historical)

(USD m)	2017	2018
Total Assets	228 142,0	256 988,0
Net operating assets	206 794,0	240 193,0
Investment in associates	7 273,0	6 021,0
Other investments	6 273,0	5 331,0
Other long term assets	6 153,0	5 391,0
Investments	1 649,0	52,0
Accounts receivable	23 171,0	25 018,0
Inventory	9 070,0	11 621,0
Other current assets	11 966,0	16 510,0
Trade payables	(7 689,0)	(8 773,0)
Other short term liabilities	(29 684,0)	(32 219,0)
Net working capital	6 834,0	12 157,0
Long term debt (includes finance leases)	(18 318,0)	(19 022,0)
Short term debt (includes finance leases)	(2 374,0)	(7 997,0)
Cash & equivalents - surplus cash	21 665,0	48 841,0
Net (debt)/cash	973,0	21 822,0
Other debt deemed items (e.g. pensions)	(10 184,0)	(6 189,0)
Provisions & other non-debt long term liabilities	(5 415,0)	(10 529,0)
Minority interests	(3 348,0)	(3 107,0)
Shareholders' equity	(217 002,0)	(271 142,0)
Total equity	(220 350,0)	(274 249,0)
Balance	0,0	0,0

E. Balance Sheet (Forecast)

(USD m)	2019F	2020F	2021F	2022F	2023F
Total Assets	277 458,5	334 739,1	354 992,0	375 013,0	394 639,0
Net operating assets	260 663,5	317 944,1	338 197,0	358 218,0	377 844,0
Investment in associates	6 021,0	6 021,0	6 021,0	6 021,0	6 021,0
Other investments	5 331,0	5 331,0	5 331,0	5 331,0	5 331,0
Other long term assets	5 391,0	5 391,0	5 391,0	5 391,0	5 391,0
Investments	52,0	52,0	52,0	52,0	52,0
Accounts receivable	28 670,2	31 537,3	32 325,7	33 133,8	33 796,5
Inventory	16 297,7	15 567,0	17 123,7	17 551,8	17 990,6
Other current assets	16 179,8	17 797,8	18 242,7	18 698,8	19 072,8
Trade payables	(11 748,7)	(11 221,9)	(12 344,1)	(12 652,7)	(12 969,0)
Other short term liabilities	(34 882,1)	(38 370,3)	(39 329,6)	(40 312,8)	(41 119,1)
Net working capital	14 517,0	15 309,8	16 018,4	16 418,9	16 771,7
Long term debt (includes finance leases)	(38 104,0)	(38 104,0)	(38 104,0)	(37 104,0)	(37 104,0)
Short term debt (includes finance leases)	(7 997,0)	(7 997,0)	(7 997,0)	(7 997,0)	(7 997,0)
Cash & equivalents - surplus cash	74 316,0	54 276,2	72 663,6	93 107,8	116 942,6
Net (debt)/cash	28 215,0	8 175,2	26 562,6	48 006,8	71 841,6
Other debt deemed items (e.g. pensions)	(6 189,0)	(6 189,0)	(6 189,0)	(6 189,0)	(6 189,0)
Provisions & other non-debt long term liabilities	(10 529,0)	(10 529,0)	(10 529,0)	(10 529,0)	(10 529,0)
Minority interests	(3 027,4)	(2 939,8)	(2 851,1)	(2 760,5)	(2 668,3)
Shareholders' equity	(300 445,1)	(338 566,2)	(378 004,0)	(419 960,2)	(463 866,0)
Total equity	(303 472,5)	(341 506,0)	(380 855,1)	(422 720,6)	(466 534,4)
Balance	0,0	0,0	0,0	0,0	0,0