

Mohamed A. Ramady

Saudi Aramco 2030

Post IPO challenges

 Springer

Saudi Aramco 2030

Mohamed A. Ramady

Saudi Aramco 2030

Post IPO challenges

Mohamed A. Ramady
London, United Kingdom

ISBN 978-3-319-67749-1 ISBN 978-3-319-67750-7 (eBook)
DOI 10.1007/978-3-319-67750-7

Library of Congress Control Number: 2017954578

© Springer International Publishing AG 2018

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Dedicated to my son, Faisal, and all past, present, and future male and female “Aramcons” of many nationalities who have made Saudi Aramco what it is today and what it aspires to be. May the “burst of energy,” embodied in the company logo, be with you.

Acknowledgments

While the book is dedicated to all *Aramcons*, I would also like to acknowledge the support and encouragement received from my many former students and friends in Aramco over the years, which prompted me to write the book as a thank you.

Other non-*Aramcon* friends are gratefully acknowledged, including Wael Mahdi, Dr. Ziad Al Sudairy, Dr. Abdelrahman Al Zamil, Dr. Abdelaziz Al Fahad, Dr. Sadad Al Hussein, Prof. Bernard Haykel, Dr. Robert Walker, Mazyad Al Khaldi, Dr. Anas Al Hajji, Dr. Faisal Mirza, Llewellyn Lewis and Abdelsamad Al Awadhi for their moral support; and my eldest son, Ali, who opened my eyes to his world of seismic engineering, 4-D imaging, and vibroseis trucks.

Needless to say, the author takes full responsibility for any errors, shortcomings, and omissions, and opinions expressed in the book are entirely those of the author without attribution to any *Aramcons* or those acknowledged.

Finally, a special word of gratitude goes to Junaid Akhtar for his tireless typing work and dedication.

Dr. Mohamed A. Ramady
2017

Contents

1 From Infancy to the Global Energy Warehouse:	
Looking into the Past Is a Guide for the Future	1
How It All Started: The Pioneering 1930s	1
From the “Seven Sisters” to Saudi Hands: 1950s–1980s	7
Leading Aramco: Different Managers, Different Challenges, and Different Objectives	10
Increasing Saudi Workforce Participation.	16
The Rise and Fall of Petromin	19
Aramco in the Limelight: Rising to the New Challenges	22
2 Not Your Average National Oil Company.	25
Ensuring Long-Term Survival: Aramco’s Upstream Might	25
Adding Value: The Emerging Refinery Empire	28
Domestic Refineries	31
International Refineries	32
Crude or Refined Product Exporter? Economic Diversification and Vulnerabilities	34
Petrochemicals: The New Frontier	38
Increased Integration and a Changed Productive Mix: <i>SADARA</i> the Crown Jewel	41
Challenges and Opportunities	46
The Glittering Prize: The Far East Connections	49
Something New Under the Sun: Saudi Arabia’s Renewable Energy Program	51
Technology and Research: A Must for Long-Term Survival	53
The Saudi Aramco Petrochemical Sector and the Planned IPO	58
3 Aramco’s New 2030 Vision and Mission Mandate:	
Managing Expectations	61
The Pillars of Saudi Energy Policy.	61
Saudi Arabia Under New Management: Key Players and Institutions	64
New Ministry: New Tasks for Aramco	71

Saudi Aramco and Vision 2030	72
Strengths	74
Weaknesses	74
Opportunities	75
Threats	75
Poverty Amid Plenty: Tackling the Subsidies Program	76
Fixing the Imbalance: The Energy Efficiency Program	79
IKTVA: Rebooting the Saudi Energy Sector	82
Saudi Arabia’s Master Contractor	87
Saudi Aramco’s Corporate Social Responsibility and the Saudi Knowledge-Based Society	90
4 From NOCs to Privatized Oil Companies: A Comparative Country Experience	93
Why Privatization?	93
State Participation in the National Resource Sector and NOC Privatization Trends	94
NOC Country Case Studies: Has Privatization Met Expectations?	99
Russia’s Rosneft	100
Norway’s Statoil	118
Brazil’s Petrobras	132
China’s Sinopec	147
The Partly Privatized NOCs: How Do They Compare?	158
5 The Aramco IPO: Governance, Listing, Options, and Policy Implications	167
Why the Need for an IPO?	167
Issues and Obstacles to Overcome	169
Aramco’s Key Asset: Its People	172
Meeting Effective Governance and Oversight	183
Reserves: Separating Fact from Fiction	193
Where to List?	205
IPO Options and Valuation	219
What Value for Aramco?	228
The Downstream Sector Could Add to the IPO Valuation	238
Launching the IPO	241
Aramco and Post-IPO Realities	245
OPEC: One Foot In, One Foot Out?	247
6 Conclusion and Recommendations	249
References	257
Index	271

About the Author

Mohamed A. Ramady is a former Visiting Associate Professor in the Faculty of Finance and Economics, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. He obtained both his BA and his PhD from Leicester University, UK, and a postgraduate degree from the University of Glasgow. He is a fellow of the Chartered Institute of Bankers (UK). He specializes on regional economics, energy, and the Saudi economy, as well as on money and banking. Among his publications are *The Saudi Arabian Economy: Policies, Achievements, and Challenges* (Springer, New York, 2010); *GCC Economies: Stepping Up to Future Challenges* (Springer, 2012); *Political, Economic and Financial Country Risk: Analysis of the Gulf Cooperation Council* (Springer, 2014); *OPEC in a Shale Oil World: Where to Next?* (Springer, 2016) with Wael Mahdi; and *The Political Economy of WASTA: Use and Abuse of Social Capital Networking* (Springer, 2016). Prior to his academic career, Dr. Ramady has over 25 years of senior level positions in banking, finance, and investment in the Middle East and Europe with Citibank, Chase Manhattan, First City Texas Bancorp, and Qatar National Bank. He also served as senior advisor to the Chairman of Qatar International Islamic Bank.

Abbreviations

ADNOC	Abu Dhabi National Oil Company
AOC	Aramco Overseas Company
Aramco	The Saudi Arabian Oil Company or <i>Saudi Aramco</i> unless otherwise denoted to mean the predecessor “Aramco” company
ARLANXEO	Aramco Lanxess Company
ASEAN	Association of Southeast Asian Nations
ATC	Saudi Aramco Products Trading Company
bcf/d	Billion cubic feet/day
BN	Billion
BNDES	Brazilian Development Bank
BOE	Barrel of oil equivalent
bp	Basis point
Bpd	Barrels per day
CASOC	California-Arabian Standard Oil Company
CCP	Chinese Communist Party
CCS	Carbon Capture and Storage
CDS	Credit default swap
CEO	Chief Executive Officer
COD	Central Organization Department
CSLF	Carbon Sequestration Leadership Forum
CSR	Corporate social responsibility
DCF	Discounted cash flow
DTVC	Dhahran Techno Valley Company
ECA	Export Credit Agency
EOR	Enhanced oil recovery
EU	European Union
EVA	Economic value added
EVP	Executive Vice President
EXPEC	Exploration and Petroleum Engineering Center
FCA	Financial Conduct Authority
GAPP	Generally accepted accounting principles

GCC	Gulf Cooperation Council
GDP	Gross domestic product
GW	Gigawatts
IEA	International Energy Agency
IFRS	International Financial Reporting Standards
IKTVA	In-Kingdom Total Value Add
IOC	International oil company
IP	Intellectual property
IPO	Initial public offering
JASTA	Justice Against Sponsors of Terrorism Act
KAEST	King Abdulaziz City for Science and Technology
KAPSARC	King Abdullah Petroleum Studies and Research Center
KAUST	King Abdullah University of Science and Technology
KFUPM	King Fahd University of Petroleum and Minerals
Kwh	Kilowatt hour
LPG	Liquid petroleum gas
LSE	London Stock Exchange
Mboe/d	Million barrels of oil equivalent/day
Mbpd	Million barrels per day
MbS	Mohammed bin Salman
MENA	Middle East North Africa
mmBtu	One million British thermal units
MOU	Memorandum of understanding
Mt.	Metric ton
MGW	Megawatts
NCS	Norwegian continental shelf
NEEP	National Energy Efficiency Program
NGL	Natural gas liquid
NOC	National oil company
NPMO	National Project Management Organization
NTP	National Transformation Plan
NYSE	New York Stock Exchange
OAPEC	Organization of Arab Petroleum Exporting Countries
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
PETROMIN	General Organization of Petroleum and Minerals
POWERS	Parallel Oil and Water Enhanced Reservoir Simulator
R\$	Brazilian Real
R&D	Research and development
S&P	Standard & Poor's
SAARA	Saudi Arabian Advanced Research Alliance
SABIC	Saudi Arabian Basic Industries Corporation
SADARA	Saudi Aramco Dow Arabia Chemical Company
SAMA	Saudi Arabian Monetary Authority
SAMAREC	Saudi Arabian Marketing and Refining Company

SARE	Saudi Company for Research Elements
SASAC	State-Owned Assets Supervision and Administration Commission
SATORP	Saudi Aramco Total Refining and Petrochemical Company
scfd	Standard cubic feet/day
SEC	Securities and Exchange Commission
SEEC	Saudi Energy Efficiency Center
SME	Small- and medium-sized enterprises
SOCAL	Standard Oil Company of California
SPE	Society of Petroleum Engineers
SR	Saudi Riyal
SSPC	Sinopec SenMei Petroleum Company
SVP	Senior Vice President
UAE	United Arab Emirates
TAQNIA	Saudi Technology Development and Investment Company
ULCC	Ultra large crude carriers
VLCC	Very large crude carriers
VP	Vice President
WA'ED	Saudi Aramco Entrepreneurship Center

Introduction and Overview

Never give advice in a crowd.

Arab proverb

Saudi Aramco has been almost daily in the international news headlines since Crown Prince Mohammed bin Salman announced in early 2016 his plan to partly privatize the company by offering around 5% to local and international investors. The planned IPO would be the largest ever according to the Prince, surpassing the largest to date, Ali Baba's \$24 billion, with Aramco's value estimated at \$2 trillion and raising around \$100 billion from the IPO. This flotation would, according to the Saudi government, transform Aramco into an international integrated energy company, increase corporate governance, and place the company at the center of the ambitious Vision 2030 economic and social transformation plan for Saudi Arabia. This aims to wean the Kingdom away from oil revenue dependency, to one that derives income from a diversified non-oil base. Along the way, Saudi Aramco would also be transformed into an energy and industrial conglomerate with a wider mandate in engineering and refined product trading. Following the planned IPO, the 95% Saudi government ownership in Aramco would be transferred to the Public Investment Fund (PIF), who would be entrusted with the IPO proceeds to invest in Saudi and international projects to generate non-oil revenue. This financial diversification is at the heart of the Vision 2030 program.

The book addresses the above issues in five chapters, with *Chap. 1* reviewing the company's rich history from the early exploration for oil to the signing of the first concession in May 1933 between the Kingdom of Saudi Arabia and the Standard Oil Company of California (SOCAL), with SOCAL's wholly owned subsidiary the California-Arabian Standard Oil Company (CASOC) managing the concession work. In 1973, the Kingdom acquired a 25% share in Aramco, increased this to 60% in 1974, and finally acquired full control of the company in 1980. In 1988 a Royal Decree was issued to establish a successor company to Aramco to be known as "Saudi Aramco."

The story of Aramco is one of a company that owes its existence to the vision and determination of a small band of geologists and explorers, whose names remain enshrined in Aramco's rich history, especially of Chief Geologist Max Steineke. However, without the astute diplomatic and negotiation skills and leadership of Saudi Arabia's founder and first King Abdulaziz Ibn Saud, Aramco would never have been established. The visionary King viewed the concession and the foreign operating partners as a means to achieve his goals to bring about public security, public health, and economic prosperity to his subjects. His grandson Crown Prince Mohammed bin Salman, in his own Vision 2030 program, enshrines the same objectives in 2017.

After many false starts, oil was struck with sufficient quantities to ensure SOCAL's continued commitment to its Saudi operations. "Lucky" well No. 7 struck oil on 4 March 1933 at the rate of 1585 bpd, and the company has not looked back ever since. Today, Saudi Arabia produces around 10 million bpd and holds estimated reserves of around 266 billion barrels of oil and 297 trillion standard cubic feet of gas. The Second World War and the post war eras gave a boost to oil consumption and Saudi Aramco's oil production grew substantially, and the company started to invest in hiring, educating, and grooming future generations of Saudi managers.

As Chap. 1 examines, the period of the 1950s and early 1960s was one of resource nationalism for many oil producers, and Saudi Arabia had an ardent visionary in Abdullah Tariki who became the Kingdom's first Oil Minister and helped to establish the Organization of the Petroleum Exporting Countries (OPEC) in 1960. The period was the era of the so-called Seven Sisters (*Esso, Mobil, Gulf, Shell, BP, Texaco, and SOCAL*) who remained in control of oil prices and contributed to the relative stability of global oil prices. It was in Saudi Arabia that the principle of 50-50 profit sharing was implemented in the Middle East between oil companies and host countries, but the oil companies demonstrated their unique powers by having the sole authority to decide upon the volume of production, the price, and the destination of oil exports, with most of the laws, taxes, and regulations of the host country not applicable to the IOCs. This put the operating companies under a difficult situation in having to serve two masters at the same time – their shareholders and the host country whose need for increased revenues grew as the economic development of the country accelerated. The chapter examines how the Saudi government tried to come to an amicable agreement with Aramco's shareholders to increase the "posted" price of oil, only to be rebuffed, but the tide of history was against them. Even prior to the 1973 war and the Arab embargo that led to a sharp rise in oil prices, Libya was the first OPEC country to initiate a price hike and imposed output restrictions on foreign oil producers, leading Occidental Petroleum Corporation to agree to higher prices. This broke the oil industry's unified front and other producers and independent oil companies raised their posted prices.

However, the 1973 war and its aftermath changed the perception of energy power between producers and independent oil companies. Producers insisted on, and obtained, increased participation levels in their concession oil companies. Saudi Arabia increased its participation to 51% in 1933, 60% in 1974, and 100% in 1980. The *Saudization* of the company was complete with the appointment of Ali Al

Naimi as Aramco's first president and CEO in 1988 paving the way for other Saudi CEOs like Abdullah Juma'h, Khalid Al Falih, and Amin Nasser to follow, with each leaving his imprint on the company's direction and key objectives. As the chapter examines, nearly all Aramco managers are the product of the company's training and career development programs, which involved the company setting up special boys' schools in the early days, like the famous *Jabal* school from which many of the first managers graduated. Initiatives to develop Saudi workers' technical and educational skills were also due to the farsighted policies of some of the American Aramco managers like Thomas Barger and Frank Jungers and the last American CEO John Kelberer who handed over to Ali Al Naimi in 1988. Aramco's workforce rose from a negligible 141 employees in 1935 to around 66,000 in 2016, to reach an 86% *Saudization* level. The chapter also examines the remarkable contribution of early Aramco female employees who held senior positions, both technical and managerial, and broke long-established taboos against employing Saudi female workers. Under the tenure of the early managers, local entrepreneurs were encouraged to enter into Aramco contracts, leading to many of today's well-known family business groups and also laying the seeds of Aramco's 2015 IKTVA or In-Kingdom Total Value Add "localization" program to spur a Saudi local contractor supply chain.

Chapter 1 examines in some detail the rise and fall of Petromin, the Kingdom's initiative in setting up a wholly owned national oil and industrial company in 1962. The initial mandate of Petromin was extensive in that it would be responsible for exploration, refining, and distribution of all petroleum and mineral resources in Saudi Arabia that were not in the domain of Aramco. The implied objective was clear: that one day Petromin was supposed to be the governmental equivalent of Aramco and to take its place. Under the leadership of Petromin's Governor Dr. Abdelhadi Taher, and with the support of then Oil Minister Zaki Yamani, Petromin's mandate was extended to include mineral projects, oil and gas exploration in areas relinquished by Aramco, distribution of oil and gas refined products, as well as starting its own oil shipping operations and industrial projects in glass and steel, petrochemicals, and power generation. As the chapter examines, many of these grandiose projects did not materialize, were wound down, or ended in arbitration brought about by international partners. Unlike Aramco's grooming of internal management and having foreign operating partners, Petromin was beset from the beginning by power politics and rivalries between competing groups who were close to whichever Saudi King was in power. Employment and hiring was based on nepotism and project selection was not well thought through. The above situation could not be allowed to continue forever, and gradually Petromin's power base and assets began to be stripped away from the company.

In 1988, when Aramco became a wholly owned Saudi company, Petromin's subsidiary SAMAREC (Saudi Arabian Marketing and Refining Company) was merged with Saudi Aramco, and all of SAMAREC's refining facilities – three domestic wholly owned and three joint venture refineries – were transferred to Aramco. The death of King Faisal, the dismissal of Oil Minister Zaki Yamani by King Fahd in 1986, and the appointment of Hisham Nazer and Dr. Ghazi Al Gosaibi as Ministers of Oil and Industry, respectively, hastened Petromin's demise. This first came about

in 1976 by stripping Petromin's heavy and petrochemical industries and creating the Saudi Arabia Basic Industries Corporation or SABIC, with Dr. Gosaibi as chairman, and then removing Petromin's mining assets into a new Saudi national company MAA'DEN in 1997, with Ali Al Naimi as chairman. Since that date, the mining sector has been linked to the Petroleum Ministry of Saudi Arabia. The final blow came in 2005 when King Abdullah officially wound down Petromin and Aramco emerged victorious.

Aramco's apparent victory over its nascent rival Petromin on who would finally shape the future of Saudi Arabia's energy sector has provided Aramco with many lessons on how to avoid Petromin's mistakes, and *Chap. 2* examines how Aramco has tried to remain focused on its core strengths, both upstream and downstream. The company today produces approximately one in every eight barrels of the world's crude oil supply and continues to expand its production capacity to meet forecasted global demand, especially from China and India, despite "peak-demand" forecasts that the age of fossil fuel is near. Chapter 2 examines how Saudi Aramco is meeting this challenge by also creating value from the hydrocarbon resources it produces in its downstream refining and petrochemical sector, something that earlier CEOs like Abdullah Tariki and Ali Al Naimi had been pressing for.

In order to support its global refinery and petrochemical projects, Aramco has invested in significant upstream field maintenance and new field expansion program in both onshore and offshore oil and gas, as the latter is a critical feedstock for its petrochemical projects. The company's principal gas facilities are located in the *Fadhili, Midyan, Shaybah, and Wasit fields*, while the major oil fields are *Abqaiq, Haradh, Khursaniyah, Qatif, and Shaybah*. The "crown jewel" though of Aramco's current focus is the refining and petrochemical assets it controls in-Kingdom and through wholly owned or international joint ventures abroad. Just as Petromin had hoped to achieve earlier, Saudi Aramco today refines, manufactures, markets, transports, and supplies crude oil, petroleum, petrochemicals, and products to wholesale and retail customers through ten domestic and four international operations. Based on direct ownership, Aramco today is the world's fourth largest refiner behind ExxonMobil, Royal Dutch Shell, and Sinopec. However, among Aramco's refineries and petrochemical complexes are world-class "jewels" in their own right, including the \$20 billion *SADARA* – Saudi Aramco Dow Chemical joint project, the world's largest integrated chemical complex, with a production capacity to produce nearly 8 million metric tons of olefins, polyolefin, and an extensive range of high-value diversified "specialty" chemicals and plastics.

Internationally, Aramco has joint ventures in South Korea, Japan, and China, as well as a wholly owned refinery, Motiva, in Port Arthur, the largest refinery in the USA with 603,000 bpd capacity, with Aramco acquiring Shell Oil's 50% equity stake in 2017 for \$2.2 billion and also assuming the company's outstanding \$3.1 billion debt. The chapter highlights that the majority of Saudi Arabia's exports of crude and refined products are to Asia and Far East countries, making the pivot to the "East" a key priority as demonstrated by King Salman's visit to several Asian countries in mid-2017. The renewed emphasis on petrochemicals as a source of non-oil revenues has been clearly set out in the Kingdom's National Transformation

Plan 2020 or NTP 2020, where petrochemicals are estimated to contribute around \$30 billion by 2030 and to add another 30,000 new high-value Saudi jobs.

Chapter 2 also examines another Saudi petrochemical giant – SABIC – whose founding roots are some of the divested Petromin assets. Today SABIC is the world’s fifth largest chemical company and operates in 50 countries, through 40 production units, manufacturing polymers, specialties, agri-nutrients, and metals. Under Crown Prince Mohammed’s economic reform program and Vision 2030, there is now more effective and synergy between different Saudi government entities, and both SABIC and Saudi Aramco are now engaged in discussions to establish joint venture oil-to-chemicals projects, joint US shale gas acquisitions, and core R&D to avoid duplication of effort. The lessons of Petromin have been well learned, and whether there will be an eventual merger of the two companies’ petrochemical operations or they continue to form alliances on a project-by-project basis is still too early to say. However, their newfound cooperation has been welcomed, given that both companies’ petrochemical feedstock – associated gas – is in limited supply, and the oil-to-gas initiative could be a major breakthrough as well as Aramco’s non-conventional gas initiatives in Saudi Arabia.

The emerging status of US shale gas as a global game-changer for the petrochemical industry, given its competitive pricing, has made acquisitions in this sector a natural option for both Saudi Aramco and SABIC to explore. Chapter 2 examines in detail Saudi Arabia’s competitive cost advantage in Saudi ethane and ethylene prices against European and Asian naphtha producers, but US shale ethane prices are creating serious competitive pressures for Saudi Arabia, especially in periods of low oil prices. Saudi Arabia also faces competition in the future from a resurgent Iranian petrochemical sector, as foreign companies like Total and BP are exploring investments in this sector as well as in the expansion plans for the *South Pars* gas field, the largest nonassociated gas field in the world, shared jointly with Qatar.

To meet some of these emerging challenges, and to ensure that the Kingdom has a greater access to the Asian markets in terms of both crude oil exports and meeting local petrochemical demand, Saudi Aramco signed some major refinery deals during King Salman’s 2017 Asia visit. These included an agreement with Malaysia’s Petronas for a \$7 billion refinery investment and a joint venture agreement with Indonesia’s PERTAMINA and with China’s NORINCO to build a refinery and chemical complex. India is also an important market for Saudi Aramco, and the company upgraded its presence in that country with a new office opened in New Delhi as well as started discussions with India’s top refiner, the Indian Oil Corporation, to invest in the company’s \$30 billion 5-year petrochemical and refinery project. Given this global reach, it was not surprising to note that Aramco is planning to buying and selling non-Saudi third party crude and refined product trading under the expanded mandate of its Saudi Aramco Products Trading Company which will put it on par with International Oil Companies.

Given global concerns about fossil fuel emissions and the advances made in renewable energy, Saudi Arabia has also taken a strategic decision to invest in solar energy and become another “global solar energy warehouse,” with a commitment to have around 10% of total installed energy capacity coming from renewables by

2023, or 9.5 GW of renewables. A \$50 billion program to boost solar and wind power generation is being rolled out and Aramco is actively involved in this effort. In order to remain at the cutting edge of petrochemical and renewable energy, as well as boosting production in the upstream production, Saudi Aramco has undertaken significant steps in setting up advanced R&D centers in both Saudi Arabia and abroad in collaboration with leading universities and specialized research centers. These R&D centers are located in the USA, Europe, and Far East, but in-Kingdom initiatives such as the Company's Exploration and Petroleum Engineering Center – Advanced Research Center are breaking new ground.

As part of its mission to contribute toward deepening the country's knowledge-based economic transformation, Saudi Aramco has been active in obtaining new patents and, more importantly, commercializing these to the benefit of Saudi society, with the number of applied and awarded patents steadily increasing. Any valuation of Aramco for the planned IPO should consider the intrinsic value of such patents, especially those with provable commercialization prospects. While many oil-producing countries are facing fiscal distress due to lower oil prices over the period 2014–2016, Saudi Aramco has reassured both domestic and international partners that it is committed to its long-term capital expenditure program. Around \$300 billion has been earmarked for new capital expenditure over the next decade to maintain its spare capacity as well as explore for nonassociated gas and expand its technical expertise to dispel the notion of “misleading peak oil demand and stranded resources” as stated by Aramco's CEO Amin Nasser.

Chapter 2 concludes by touching upon some key issues that might be faced concerning the downstream sector for the planned IPO. These questions revolve around how to price refinery assets of different age and product output and different ownership structures for both domestic and international refineries, all of which will require more stringent audited financials for listing on stock exchanges. The issue of domestic energy price subsidies and reducing such subsidies in the future, as the NTP 2020 calls for, will affect the profitability and valuation of these Saudi assets. To date, it has not yet been made clear on whether the planned Aramco IPO will also include domestic or international assets, or both, or whether the IPO will only include wholly owned Saudi assets or joint ventures. The chapter's survey of Saudi Aramco's downstream refining and petrochemical exposure ensures that whatever the final decision, including a portion of the downstream sector in the company IPO valuation will be greeted positively by potential investors.

Chapter 3 addresses Aramco's new 2030 vision and mission mandate and how raised expectations can be managed. After a surge in prosperity over the past decade, especially during the period 2003–2013 fueled by rising oil prices, the Saudi Arabian economy was at an inflection point, especially when oil prices fell during the period 2014–2016. This created an opportunity for the country's leadership to inject new dynamism and a new strategic approach through productivity and a focused investment transformation. This involves changing society's mind-set, especially in that the era of generous government handouts and subsidies will gradually be changed but that the private sector will become the main engine of economic growth to wean the economy off oil revenue dependency. Another aim is also to change the current structure of the Saudi labor market which is distorted with a

heavy reliance on cheap foreign labor and a preference for public sector jobs by Saudi citizens, resulting in almost half of the total annual government expenditure spent on salaries, wages, and allowances. Sometimes ambitious transformational changes need to be reassessed in light of initial results. During late 2017, it was reported that the Saudi government was redoing some elements of the initial National Transformation Program 2020 to ensure that it was more focused with clearer and achievable governance and objectives, and to ensure that the NTP was in coordination with the broader Vision 2030 blueprint for life after oil.

Just as key government and technocratic personalities dominated the fate of Petromin and Aramco's early establishment, the same applies to the current Vision 2030 leadership. The naming of Deputy Crown Prince Mohammed bin Salman, or *MbS* as he is widely known outside the Kingdom, as Crown Prince in June 2017 has brought about clarity on who is now fully managing the new transformational changes of Saudi Arabia. The Crown Prince is not only Chairman of Aramco's Supreme Council but also Chairman of the Public Investment Fund and Minister of Defense as well as heads the Economic Development Council. All this ensures that there is now a tight "top-down" management of the Saudi economy whose final aim, as set by the Crown Prince, is to instill a new culture of transparency, accountability, and consistency to reduce business uncertainty for Saudi and foreign investors alike. Setting and prioritizing a generational transformation agenda will hopefully bring clarity to enable delegation of responsibility and establish accountability. The announced National Transformation Plan 2020 and the Vision 2030 set out medium- and long-term economic and social objectives, as well as established precise "benchmarking" and "key performance indicators" (KPIs) to be followed by all ministries and government agencies. Such introduced KPIs and other measurable benchmarks are hallmarks in how Aramco manages its own projects and delegation of responsibility and accountability. It was not a surprise to have such well used Aramco management concepts rolled out to wider government agencies, as Aramco has often been seen as an "oasis of managerial excellence" and efficiency in the Kingdom.

As part of this transformation agenda, Saudi Aramco would change from being an oil-producing company into an "industrial conglomerate." Following the official release of the Vision 2030, the government quickly moved to carry out a comprehensive restructuring of key government operating bodies and restructuring of ministries. In a move that affected Saudi Aramco the most, Khaled Al Falih's Ministry of Petroleum and Mineral Resources was renamed the Ministry of Energy, Industry and Mineral Resources. These sectors constitute the main pillars of the Saudi economy, and their integration and coordination will affect how the Saudi economy truly diversifies in the decades to come. In an eerie way, it seems to bring to life Petromin's mandate to be in control of these three levers of economic power, as noted in Chap. 1.

Besides his role as Aramco's chairman, Minister Khaled Al Falih also became Chairman of the Board of Directors of the Royal Commission for *Jubail and Yanbu*, Saudi Arabia's mega industrial hub, as well as the Saudi Industrial Development Fund. Added to his responsibilities were the chairmanships of the Organization for Industrial Estates and Technology Zones, the Saudi Geological Survey, the King Abdulaziz City for Science and Technology (KACST), the Saudi Exports Development Authority, and the King Abdullah City for Atomic and Renewable Energy (KA-CARE).

Another key appointment was Khalid Al Falih's chairmanship of the Saudi Arabian Mining Company (MA'ADEN). No other Saudi minister has amassed such wide sweeping powers, giving him a bird's-eye view of these inter-linked sectors and ensures that Saudi Aramco plays a central role given its expanded mandate as a conglomerate.

Chapter 3 also explores the Kingdom's current energy subsidy program and the Vision 2030's planned reforms at tackling the problem without drastically affecting individual households and industrial efficiency and productivity, especially in the key petrochemical sector. The Vision 2030 calls for supporting heavily impacted strategic industrial sectors with high Saudi employment or contribution to GDP and redirects some of the reform savings toward emerging industry priorities. A key element is to increase energy prices gradually to allow impacted industries to adapt with the aim to bring all products to reach 100% of "market international reference" prices by 2020 for households and by 2019 for industries. In the meantime, the Kingdom will embark on an energy efficiency program by implementing support and capability building, performance management, and efficiency financing. Increasing Saudi gas production, both conventional and unconventional or shale, is central to the Vision 2030 plans, and Aramco is at the forefront of that effort. This has prompted the company to explore new gas fields such as nonassociated gas from the *Hasbah and Arabiyah* fields as well as from the *Wasit and Fadhili* fields as more than two-thirds of the Kingdom's gas is still derived from the giant *Ghawar* field and from *Karan*, the first offshore nonassociated gas field but which had hit a peak in 2012, forcing Aramco to explore the abovementioned fields. To ensure that Aramco is actively engaged in energy efficiency, the company participated in various programs such as the National Energy Efficiency Program (NEEP), later becoming the Saudi Energy Efficiency Center (SEEC), by working in close cooperation with both KACST and KA-CARE. Aramco's interest in energy efficiency and renewables predates the planned IPO as the company had been intimately involved in Saudi Arabia's energy R&D activities as well in its own global research centers.

While energy efficiency is one of Aramco's objectives, the company has been at the forefront in promoting local content through its In-Kingdom Total Value Add or IKTVA program to achieve a 70% local content and create 500,000 new jobs, as well as add 30% of exports from Saudi-based IKTVA-related companies. These objectives are to be realized by 2021. The challenge to foreign contractors was simple: Saudi Aramco will henceforth monitor local content element and Saudi employment targets to award contracts. Foreign companies were free to choose the manner by which they could qualify, as long as final production was carried in-Kingdom, whether through wholly owned or joint venture operations. Aramco's 2015 local content initiative has not gone unnoticed, and Crown Prince Mohammed bin Salman has instructed other government institutions to adapt their contract awards to ensure stricter local content compliance.

Saudi Aramco has a major project pipeline of its own to ensure that it can implement a viable local content policy and that Saudi companies play a meaningful role. Among these planned mega projects is the King Salman International Complex for Maritime Industries and Services at *Ras Al Khair*, a joint venture with South Korea's

Hyundai and the UK's Lamprell Company. The project, one of the largest civil engineering projects costing around \$5.4 billion, is expected to create 80,000 direct and indirect new jobs in engineering, manufacturing, and repairs for rigs and vessels. Other Aramco projects include managing a new industrial and energy city in Dammam, as well as an offshore and oil and gas platform fabrication yard with McDermott, all of which will transform Aramco into a major Saudi "master builder." During Donald Trump's historic first overseas visit as president to Saudi Arabia in May 2017, the Kingdom signed multibillion mega military and civilian deals with US companies. Saudi Aramco signed Memorandums of Understanding (MOU's) totaling \$50 billion with leading American energy and engineering companies with local content emphasis as a priority. Collaboration with such world-class US companies will ensure that Aramco has access to some of the most advanced oil and gas technologies and project management skills for years to come. For the planned IPO, such a strong international technical and management alliance should also provide a high level of investor confidence in the ability of Aramco to undertake large-scale and complex projects.

As noted in Chap. 1, Saudi Aramco today and its predecessor Aramco is involved in a wide variety of corporate social responsibility (CSR) activities, a legacy from its early days when the Kingdom relied upon the company to provide services ranging from education to health for its own employees as well as to the wider community. Chapter 3 examines these CSR activities in detail, which includes *Wa'ed* as an incubator to develop local enterprises, a Women's Business Park, and *Maharat*, whose aim is to develop young Saudis for specialized construction trades for the *Jazan* Refinery. Besides the above, Aramco established the John Hopkins Aramco partnership, which is expected to transform the practice of Medicare and healthcare in the Kingdom, and set up the first Autism Center in Dammam. To encourage students to discover science, the company has been a pioneer with knowledge incubators and other advanced technology, science, and multimedia skills. While all these CSR initiatives are laudable, questions are raised that the planned IPO might consider these activities as distracting from the company's core activities. The next two chapters examine how partly privatized national oil companies (NOCs) have managed such initiatives and the possible impact it may have on the planned IPO.

Chapter 4 analyzes the history of four NOCs – *Rosneft*, *Statoil*, *Petrobras*, and *Sinopec* – to assess how their partial privatization was effected and how each NOC managed to meet its stated mandates and overcome privatization issues. The chapter sets out arguments for and against privatization of state assets. Among arguments in favor of continued state ownership is that this allows pursuit of social objectives and not just profit maximization and that state ownership is often due to a response to market failure and price manipulation. Arguments against state ownership include that state-owned enterprises (SOEs) are relatively inefficient compared to their privatized or listed peers, that they are also relatively inefficient due to inadequate monitoring by external shareholders, operating under soft budget constraints, and that governments can use them to pursue noneconomic objectives, such as reinforcing political support at the expenses of efficiency. Many of the above points resonate for the justifications given to privatize Saudi Aramco but are examined in more

detail to see if they are indeed justified in Aramco's case or they pertain more to the four selected NOCs.

The main drivers for state participation in the national resources sector can either be noneconomic or commercial and fiscal objectives. The noneconomic objectives can be both of a symbolic and practical nature, whereby NOCs are seen as "symbols" of national champions and sovereign pride under slogans such as the "oil is ours," which can be a powerful and emotive slogan. Commercial and fiscal objectives however are focused on maximization of revenues flowing to the state from the NOCs in the form of royalties, taxes, and dividends. How an NOC is perceived is sometimes not clear-cut as some NOCs may be viewed as a strategic resource, while the sovereign which owns the NOC follows a market-based economy, which is the case of Saudi Arabia and Aramco. NOCs and their ownership raise strong emotions, and governments have to take this into consideration when contemplating full or partial privatization of their NOCs as key to public acceptance is choosing a model that suits a country best, given the country's economic and social structure. The Saudi public holds Saudi Aramco in esteem as a bastion of efficiency and good corporate management. A key issue facing the Saudi government is in "selling" the Aramco IPO to some skeptical sections of society who are attached to the "national symbol" that Aramco represents or those that do not see enhanced fiscal or commercial objectives accruing after privatization.

The four country case studies from Russia (*Rosneft*), Norway (*Statoil*), Brazil (*Petrobras*), and China (*Sinopec*) were chosen to illustrate the different privatization paths chosen to assess whether there were any common elements that bind them together and which can provide a blueprint guide for the planned Aramco IPO. The first NOC analyzed was *Rosneft*, and the privatization of the Russian oil industry was somewhat unusual, as there seemed no compelling rationale to do away with state ownership. There appeared to be little evidence of any direct correlation between ownership type and the establishment of a world-class oil company. Unlike other countries like Saudi Arabia, the UAE, and Venezuela where one national oil company existed, Russia had multiple private-owned oil companies and there was no clear consensus on the merits of privatization, with most of these NOCs owned by tycoons and "oligarchs" in the post-Soviet era. Following its formation in 1993, Rosneft was the largest oil company in Russia, but during the 1990s it was stripped of almost all its major assets as new oil companies were formed and privatized under the Yeltsin regime. However, the election of Vladimir Putin as president of Russia changed Rosneft's fortunes, and the company became one of the cornerstones of Putin's presidency to retake control of the so-called commanding heights of the Russian economy and the critical energy sector. Under Putin's presidency, Rosneft began with the consolidation of the company's existing subsidiaries under new management led by current CEO Mr. Igor Sechin, who is the driving force of the company.

By 2016, Rosneft was producing in excess of 5 million bpd or nearly 50% of total Russian oil production, unlike Aramco's total dominance of Saudi oil production. Rosneft's IPO was launched in 2006 and the company sold around 15% of its total equity for \$10.4 billion, implying a value for the whole company of \$70 bil-

lion, with shares sold to a combination of institutional and private investors on the London and Moscow stock exchanges, as well as to three initial strategic investors, BP, Petronas, and CNPC, with the Russian government retaining an 85% stake. By 2017, the share ownership structure had fundamentally changed, with the Russian government's stake reduced to 50% plus 1 share, with BP Russian Investment Ltd. at 19.75%, Qatar's investment through QHG Shares Ltd. at 19.5%, and a free float of 10.75%. According to Rosneft, the company has attracted world-class institutional investors like Credit Suisse, HSBC, JP Morgan Asset Management, BlackRock, and Deutsche Asset Management.

The emergence of Rosneft as a publicly listed company on both the Moscow and London Stock Market not only allowed finance to be raised for the Russian government and the company but also changed the dynamics of the company's development as a global player, helping Rosneft to aspire to be a "Super-NOC." A combination of objectives, such as the advantages of being a state-controlled NOC, with insulation from political risk, access to policy makers, as well as best corporate governance and transparency, transformed Rosneft and placed the company into a category defined by the World Bank as "partial NOCs." In this category are Petrobras, Statoil, and Sinopec. The announcement of Saudi Aramco's planned IPO and its objectives to transform the company echoes the Saudi government's belief that the same post-IPO benefits will be achieved by the company, including attracting an even wider world-class "blue chip" institutional and sovereign fund investors.

As part of its internationalization and quest for more transparency, Rosneft's hydrocarbon reserves have been independently audited by the American company DeGolyer and MacNaughton, using US Securities and Exchange (SEC) classification rules, as well as according to the Petroleum Resources Management System (PRMS) classifications. Both Saudi Aramco and the other three NOCs assessed in the book use DeGolyer and MacNaughton in conducting their reserve audits, but the issue on whether these were carried out using the stricter SEC definitions or the PRMS classifications will be discussed, as there are differences leading to varying reserve figures. As of 2016, Rosneft's hydrocarbon reserves were approximately 34 billion BOE, of which hydrocarbon liquids and gas reserves approximated 24 billion barrels, making these reserves significant for the next 19 years of production. The difference between the 2015 reserves using the SEC and PRMS was 8.4 billion of oil equivalent or nearly 25%, illustrating the difficulties in agreeing to a common reserve audit classification.

Since joining the ranks of the privatized NOCs in 2006, Rosneft has moved to reassert its dominant position both in the upstream oil production and in the downstream refining sectors and is now Russia's biggest refiner with nearly 30% of the country's refinery production. Since partial privatization, Rosneft's strategy has also focused on becoming a more commercial organization intent on generating increased returns from its asset base and has generally outperformed its Russian peers in terms of upstream profitability per barrel and production costs per barrel which are well below industry average, making Rosneft the most profitable Russian energy company in 2010 from being the least profitable in 2006. This turnaround is a pleasant development for those advocating the Saudi Aramco IPO, as it seemingly justi-

fies their argument that the Saudi NOC can become even more profitable and commercial oriented to meet wider shareholder interests.

However, the benefits of being a country's primary NOC can also come with a heavy burden of government-imposed obligations that can inhibit the financial performance of an NOC as a commercial entity, especially when NOC has to take on responsibility for investing in socially and politically important sectors and ensure a large employee base. Such CSR issues have already been highlighted as one of Aramco's obligations, and Rosneft's social spending per barrel of production is higher than its Russian wholly privatized peers, as well as production per employee. Rosneft's key CSR donations were in the development of social infrastructure in the regions of Rosneft's presence, sport, education, and cultural events, as well as Army veterans and pension groups. However, unlike Aramco's CSR program where the Saudi company *owns and operates* major programs and activities, Rosneft makes charitable donations and the amounts are clearly listed in the company's audited figures unlike Aramco's lack of detailed financial data and breakdown for its CSR activities. This issue will have to be addressed when Aramco releases its investor IPO prospectus.

Despite additional CSR costs, Rosneft has performed well against its domestic peers and has been rewarded by investors with a premium rating and other valuation metrics, with a price/earnings (PE) ratio of 5.4 compared to an industry average (ex Rosneft) of 3.93, or a 37% Rosneft premium, with a higher valuation also registered for all other enterprise value (EV) metrics like EV/reserves, EV/production, and total EV. Again such post privatization premium valuations should be encouraging to those advocating the Aramco IPO.

In parallel with the above improvement in Rosneft's valuation, the company appears to have taken some steps to reduce the Russian government's influence and has improved corporate government and transparency measures by clearly setting up a system of relations between the executive bodies, the Board of Directors, and stakeholders with the aim to exercise rights of shareholders and investors and increase the company's investments. The number and scope of Rosneft's disclosure statements have increased, and the company now presents its financial results in accordance with International Financial Reporting Standards (IFRS). The above issues are something that a privatized Aramco has to comply with, especially in how the company will manage its relationship with its majority government shareholder and the number and power of independent board members. Despite a Russian presidential decree in 2011 that all government representatives should leave the boards of state-owned companies, Rosneft's Board of Directors still have some senior political relations to the state through its Chairman Andrey Belousov who is an assistant to the President of the Russian Federation and Mr. Alexander Novak, the Russian Energy Minister. Applying a dividend payment policy that is acceptable to both the majority government and minority private shareholders is important for all partly privatized NOCs, and the same will apply for Aramco once it decides on its post-IPO dividend payout policy. Rosneft's current dividend payout rate is 35%.

The second NOC analyzed was Norway's *Statoil*. The company started life in 1972 as *Den Norske Stats*, as a state corporation, and in 2001 it changed its name to Statoil

and is listed in the Oslo and New York Stock Exchanges. Today, the company has operations in 25 countries in Europe, Africa, Asia, and the Americas and is involved in all areas of the petroleum cycle – exploration, production, refining, and distribution. Unlike the other three NOCs analyzed, Statoil is the only partly privatized NOC to issue not only one, but *three*, investor-related reports, namely, an audited annual report, a separate statutory report in accordance with Norwegian regulatory requirements, and a Board Statement on Corporate Governance report which sets out and reconfirms individual board members joint and separate legal and oversight responsibilities. The last report also sets out issues of risk, remuneration, salary scales, and board duties in great detail, as well as the financial results. Few, if any other, NOCs, let alone international oil companies (IOCs), deliver such a diverse and transparent list of reports. Statoil has indeed set a very high bar for other NOCs and for Saudi Aramco and NOCs considering partial privatization.

Statoil's current status is largely due to the political decisions taken by the Norwegian state which decided to set ceilings on the country's oil production rate, not because of collective producer agreements like the one that Russia, a non-OPEC member, did with OPEC in 2017, but to keep the impact of the new energy sector to a manageable level on the overall economy, since it recognized the potential for social and economic dislocation if Norway became too dependent on oil revenues. This, in a paradoxical way, is different from many other resource economies whose overriding aim is to maximize oil revenues now before reserve depletion rates or shifts in energy demand patterns change, leading to some to try to wean their economies *away* from oil in the future. This is what Saudi Arabia's Vision 2030 and its plan for Saudi Aramco wishes to achieve.

Like Saudi Aramco, Statoil places a high degree of emphasis on R&D, with the company researching, developing, and deploying technology to create opportunities and enhance the value of Statoil's current and future assets. Unlike other NOCs or Saudi Aramco, Statoil has had strong growth in production within the US shale sector since entering into the first shale "play" in 2008 and extended this to other major US shale fields like the Bakken in 2011 and Eagle Ford formation in 2010. Statoil's proved reserves are estimated and presented in accordance with the US SEC rules and have provided information on its reserves by geographical region and made downward revisions in proved but undeveloped reserves for Eurasia and the Americas linked to lower commodity prices resulting in earlier economic cuts. This stringent application of reserve estimations by Statoil has ensured that its own reserve estimates are generally in line with third-party independent audits.

The company's conservatism has been guided by a clear corporate governance structure and a Board of Directors mostly composed of independent members, despite the Norwegian state owing 67% of the company. This is specified as per the Norwegian parliaments' decision of 2001 concerning a minimum state shareholding in Statoil of two-thirds. Another feature of Statoil's corporate governance that differentiates it from the other three NOCs is the significant role played by Statoil's employees in the nomination and election of board members at the Corporate General Assembly meetings, with three board members elected by employees out of a total of ten board members. In a further differentiation of Statoil from other NOCs,

Statoil's senior management is not represented on the board, unlike Aramco where the company CEO Mr. Amin Nasser is a board member. Out of the ten Statoil board members, with the exception of four board members, all the others are considered independent, and the fact that five members are female makes Statoil's Board of Directors not only the most independent of the four partially privatized NOCs but also the most gender diverse.

To ensure that earlier cases of bribery and corruption scandals that affected Statoil in 2003 involving payments to Iranian intermediaries are not repeated, both the company CEO and the full Board of Directors have now to make a signed board statement on reporting of payment to foreign governments in accordance with the Norwegian Securities Trading Act. This further differentiates Statoil from other NOCs and places it on a par with international oil companies who are subject to foreign corruption act payments. Statoil, like Rosneft and other NOCs surveyed, prepares its consolidated financial statements in accordance with International Financial Reporting Standards, but the Annual Report is also produced on *Form 20-F* subject to the requirements of the US SEC Act of 1934. Concerning its dividend policy, Statoil has noted that the company cannot give an assurance that future dividends will be paid or predict the amount of dividends as this will depend on a number of factors prevailing at the time the board considers dividend payments. This statement is significant and is something that a post-privatized Aramco board has to bear in mind to ensure that a relatively high dividend payment in 1 year is not automatically taken for granted that the same payment rate will be applied in future years, but is tied to the company's financial performance. This could potentially cause a conflict with the majority government owner who needs assurances on a preferably high, but predictable dividend payment policy; otherwise, questions will be raised on why the government relinquished part ownership to private stakeholders.

Brazil's *Petrobras* was the third NOC to be analyzed. The company was incorporated in 1953 as the exclusive agent to conduct the Brazilian Federal Government's hydrocarbon activities but lost this exclusive right in 1997 when the Brazilian Congress authorized the government to contract with any state or privately owned company and created a concession-based regulatory framework and established an independent regulatory agency to oversee the energy sector. Over the decades, Petrobras has developed a special expertise in deep-water exploration and production from developing Brazil's offshore basins, including the giant saltwater *Campos and Santos basins*. In line with other NOCs, Petrobras as early as 1972 decided to diversify its asset base internationally in order to increase its resource base and reduce Brazil's dependency on imported oil and gain international experience and expertise. This has resulted in an international business, which now covers nine countries in the exploration, production, refining, distribution, and gas and power sectors. Unlike the four NOCs under study, Saudi Aramco's international expansion does not include acquiring energy reserves in other countries given its stated large oil reserves in Saudi Arabia, but the concentration of such strategic production reserves in one geographic location could raise potential risk if access to the reserves is blocked due to geopolitical reasons, which is one of Saudi Aramco's risk factors.

The Brazilian government took a decision to expose Petrobras to the international investment community through a listing on the New York Stock Exchange in 2000, which was the final step of the company, as it was partly privatized in 1992 when Brazilian shareholders were offered 45% of the company, with the state retaining 55%. The current state ownership is 64% with the remaining 36% owned by a combination of domestic and international investors. One of the major reasons for an international listing was the government's objective to source foreign capital inflows to develop Brazil's ultra-deep oil reserves, with an estimated \$215 billion of capital required. A major part of the funding of this outlay has been provided by the \$70 billion equity share sale in 2010.

Just like other NOCs and Saudi Aramco, Petrobras' growth as an international and listed company has not removed its obligation as Brazil's domestic NOC, with the company still continuing to play an important role in Brazil's social programs. Like Saudi Aramco, Petrobras places great emphasis on local content, with a 37–55% local content requirement for the exploration phase and a 55–65% in the development and production phase, somewhat lower targets compared with Aramco's overall but undifferentiated 70% level.

In another policy change, Brazil's competitive concession regime has now been replaced by a production sharing agreement, under which Petrobras will become the operator of *every field* in the pre-salt layers and will have a minimum 30% stake in these fields, thus partially reintroducing the NOC monopoly model for the new fields. This new Brazil model mirrors the Norwegian government's decision to have Statoil manage not only its own production and marketing but also the Norwegian state's other production output.

Brazilian law requires the federal government as the controlling shareholder, to hold the majority of Petrobras shares with voting rights and thus hold power to elect the majority of the company's Board of Directors, and in turn, the company's executive officers are elected to the Board of Directors. This model of board directorship is the one currently operating for Saudi Aramco. Petrobras has issued two classes of shares listed on stock exchanges, namely, common shares which grants voting rights to holders and preferred shares with no voting rights but guarantees priority in dividend distribution and is different from the share structure adopted by both Statoil and Rosneft. In Brazil, Petrobras shares are listed on the Sao Paulo Stock Exchange and in the USA through the American Depositary Receipts (ADRs) which are certificates issued by American banks that represent shares of a foreign company in the USA and are listed on the New York Stock Exchange. Foreign investors hold 39.9% of voting capital and 44.2% of non-voting preferred shares. Like Rosneft, some international blue chip investment companies like BlackRock Inc. of the USA hold approximately 5% of preferred shares.

Brazil and Petrobras have been embroiled in one of the country's largest corruption scandals involving the so-called *Lava Jato* or car-wash scandal aimed at criminal organizations engaged in money laundering in multiple Brazilian states. Federal investigators focused on irregularities involving Petrobras contractors and suppliers and uncovered a broad payment scheme that involved a wide range of participants including former Petrobras employees. It seems that all of them colluded to obtain

contracts with Petrobras, overcharge the company, and use the overpayments to fund political party members and other public figures. The ramification of the *Lava Jato* affair is still continuing in 2017. While Petrobras has pleaded that it is the innocent party, the incident has prompted the company to establish internal measures to strengthen compliance and set up a comprehensive corruption prevention program and code of ethics and conduct nearly 12,000 integrity due diligence procedures and background checks as part of the decision-making for appointing personnel to key positions. An independent “whistleblower” channel was established with a guarantee of anonymity and a commitment not to retaliate against the whistleblower, something that Aramco has also established following its own corruption cases.

The Petrobras Board of Directors is composed of a minimum of seven and maximum of ten members, and these are elected at the annual general meeting of voting shareholders, including employee representatives by means of a separate voting procedure, like Statoil’s employee representation, except that Petrobras employees can only nominate one board member compared with three for Statoil. Again, unlike Statoil, the federal government always has the right to elect the majority of directors, and in addition the Ministry of Planning, Budget, and Management must indicate one of the board members. As of 2017, there were two board members appointed by the minority-preferred stock shareholders.

Petrobras determines its oil and gas reserves in line with US SEC regulations as well as the Society of Petroleum Engineers criteria and the ANP/SPE Brazilian Agency of Petroleum (ANP). The end of year 2016 reserve audits under the various criteria differed and is quite significant, accounting for around 2.8 billion barrels of oil equivalent for 2016. This is a 22% lower estimate using the SEC criteria which Petrobras has to file under the 20-F SEC audited accounts filing.

The last NOC analyzed is China’s *Sinopec* and the company appears to operate as an autonomous entity following a partial privatization in 2000, with a flotation in the Hong Kong, New York, and London markets and raising \$3.7 billion by issuing 1.8 million shares or 20% of its total shares. A Shanghai listing was also completed in 2001. Analysts however claim that Chinese NOCs are still controlled to a large degree through a deeply entrenched mechanism that direct the state’s energy policies and strategic interest through these NOCs. While a spate of Chinese Communist Party (CCP) reforms, corporatization, and internationalization of Chinese state-owned enterprises have given these NOCs a degree of operational autonomy, the underlying policy-making direction is still subject to central government authority, especially with funding and investments.

The history of Sinopec is closely connected to various reforms that took place in the Chinese energy sector. In 1982, the China National Offshore Oil Corporation (CNOOC) was established to handle offshore explorations and joint contracts with foreign oil companies, and in 1983 the state-controlled ministries of petroleum, chemical, and textiles were integrated to form the China National Petrochemical Corporation (Sinopec). The difference was that while CNOOC functioned under the Ministry of Petroleum and Industry, Sinopec was under the direct supervisor of the State Council and was tasked to operate downstream production of refined oil products and petrochemicals. Sinopec’s mandate was also to supervise the construction

and operation of refining and petrochemical plants, as well as the marketing of refined oil products and petrochemicals. This seems to mirror Aramco's mandate, with the exception that unlike Aramco, Sinopec builds refining and petrochemical plants and takes this expertise internationally, while Aramco utilizes the services of third-party contractors.

In further reforms by China whereby the Ministry of Petroleum and Industry (MPI) was restructured in 1988 to form the China National Petroleum Industry (CNPC), CNPC was given full administrative functions and permitted to engage in onshore oil and gas development and the right to oversee international cooperation in the planning, exploration, development, and production of offshore shallow areas. With the establishment of CNPC, there were now three NOCs operating in China – CNPC, CNOOC, and Sinopec – to form the country's petroleum industry. This paved the way for the Chinese Government to give up control over the entire management of the petroleum production chain and shifted the profit and loss responsibility to the NOCs.

Sinopec's investors include around 15% of shares held by foreigners through the Hong Kong Securities Clearing Company and include JP Morgan Chase, BlackRock, and Schroder's Investment, either as beneficial owners or as custodians on behalf of other foreign investors. In terms of corporate governance, Sinopec's annual reports are sparse in detailing policies and strategies, and the reason is that the overall control and nominations of the three most senior positions – the general manager, the party secretary, and the chairman of the NOCs – are also under the Central Organization Department and all executives chosen to hold these positions are members of the Chinese Communist Party (CCP) and the chairman of the NOC is also a party secretary. The link between NOC executives and the communist party is this deeply entrenched, with movement of officials between the two further cementing this link. As such, tight control over the top executives in the energy sector is instituted. Sinopec's executives fully understand that along with stable corporate results and shareholder profitability, they also need to ensure that the company advances the communist party's interests. This inter-company and government "revolving door" policy is particular to the Chinese NOCs but is also found in Rosneft to a degree and also resembles Saudi Aramco's current board structure whereby a government Minister Khaled Al Falih is also chairman of Aramco, thus ensuring that the company's interests and those of the state are aligned. The ten Sinopec Board of Directors include four independent nonexecutive directors and bring with them a mixture of international experience with listed companies, but unlike Statoil and Petrobras, there are no employee nominated board members.

Sinopec today is the biggest provider of petroleum engineering services and integrated oil field technical services in China and the largest supplier of oil refined products. The company has also been active by seeking out international joint venture partners, and Aramco and ExxonMobil signed a deal with Sinopec to revamp its *Fujian* oil refining to triple its capacity to 240,000 bpd. Sinopec's acquisition for \$7.5 billion of Geneva-based Addax Petroleum, China's biggest foreign takeover, opened up oil production and exploration activities in the Middle East, the North

Sea, and West Africa. The reason was that compared with three other NOCs analyzed, Sinopec's crude oil and gas reserves were more modest and stood at around 2.2 billion barrels of crude oil and 7.5 billion cubic feet of gas. These estimated reserves were carried out through the company's oil and natural gas reserves management committee as well as third-party consultants to ensure the audit is in compliance with the US SEC rules. However, Sinopec does not disclose differences in reserve estimations between its in-house and external party audits.

Chapter 4 concludes by comparing the four NOCs in terms of availability, clarity, and reporting requirements of their financial data, their business model and corporate governance structure, as well as international diversification. NOC diversification involves not only geographical spread but also a variety of hydrocarbon output, and we noted that gas production had also become an important element for the four NOCs. The issue of CSR responsibilities was an important one for all of the NOCs, but they approached it in different ways depending on the strength of the NOC's political relationship with the state. Statoil stood out as the least political compared with Sinopec and Rosneft, while local content was important for all NOCs with the exception of Sinopec, where a strong emphasis on energy supply security was more prominent in line with national energy security policy agenda.

The comparative analysis did not show a positive correlation between state ownership and lack of independent board governance. Statoil, with a 67% government ownership, exhibited the highest degree of board and management independence, while Petrobras with the lowest government ownership level at 50% had a higher degree of state board participation, but this does not mean that Statoil's management cannot be influenced by the largest shareholder and does not take the country's geopolitical interests into account when making strategic international decisions. While strong corporate governance is important to the ongoing and future performance of these part privatized NOCs, investors also expect to seek better financial performance generated following their privatization. Corporate transparency increases as companies are required to publish detailed audited financials, including the more onerous Form 20-F US accounts, which pushes management to continuously improve their operating performance as they are also peer-ranked by international lenders for future borrowing requirements at investment grade or better. For Saudi Aramco, this is an important element in the planned IPO, as currently the company does not release any audited financials and the choice of a final listing center will also influence the level of financial data that will be required for release by the market regulator.

Studies indicate that for all the four NOCs, there was a marked improvement in key financial and operating matrices post privatization, especially in increased net margins, higher operating margins and operating profits per barrel of oil equivalent, as well as more enhanced field production recovery rates, especially for Statoil and Rosneft. Other matrices such as output per employee also show improvement, but employee growth post privatization was mixed, with increased employee numbers registered by Statoil and Petrobras, while Sinopec employee numbers declined. In comparison with international oil companies, the partly privatized NOCs seem to lag behind in terms of capital expenditure and financial leverage, but registered lower lifting costs per barrel of oil equivalent, with Rosneft

achieving a dominant position among its peers and the IOCs. The ability of the IOCs to source capital and generate internal cash flow has enabled them to maintain a relative superiority in terms of financial leverage over the part privatized NOCs. In the final analysis, the assessment of the four NOCs has revealed that there is no “one size fits all” privatization model that meets all the key objectives for what constitutes a “successful” privatization of an energy company given the political, economic, and social settings under which the NOC operates. This should be borne in mind when we analyze Saudi Aramco’s IPO valuation.

Chapter 5 assesses the governance, listing options, and policy implications of the planned IPO. A key aim of the Vision 2030 is to pursue a reform plan aimed at shifting the economy away from reliance on hydrocarbon revenues and paving back support for a generous welfare state to cope with the reduction in crude prices in the face of a resurgent US shale output. The proposed sale of a part of the state’s crown jewel, Saudi Aramco, is central to the economic transformation of Saudi Arabia and is driven by the Saudi Crown Prince. According to the Prince, the nation faces a stark choice whereby if Aramco is not put for an IPO, it means that it will take the Kingdom 40–50 years to develop the mining sector and a similar time period to develop the local product just like the “wasted 40 years in the past trying to develop these sectors.”

The parameters for the IPO were listed as follows:

1. It will not be “far of the 5% level.”
2. It will be based on two main factors to decide the percentage to be listed, namely, whether there will be demand or not and what is available in terms of investments in the pipeline in Saudi Arabia or outside.
3. Aramco will be listed on the Saudi exchange in addition to one or more stock exchanges.
4. The Saudi government would retain sole control over Aramco’s oil and gas reserves and would decide on production levels.
5. Aramco will have a concession to monetize these reserves.

The above guidelines are clear in their objective. The task of those trying to execute the IPO is how to work out the practicalities to accommodate the broad objectives. A further statement by the Crown Prince asserted that the Saudi government will be the one to decide on Aramco’s production ceiling and that it was the government that would decide whether it was in its interest to either increase or reduce this ceiling but bearing in mind that the government will “not take a decision that goes against the interest of the company regarding the production.” Therein lays a problem that was noted when the four NOCs analyzed, which was the potential conflict of interest between the main government shareholder and other investors and how a partly privatized NOC has to learn to manage “two masters.”

The proceeds of the planned Aramco IPO are expected to be transferred to the Public Investment Fund, the entity entrusted to diversify the Kingdom’s investments, which over time would generate substantial non-oil investment income from both domestic and international investments. In his latest statements, the Crown Prince tried to assuage public concerns by noting that at least half of the expected Aramco IPO proceeds would be invested in the Kingdom, following some disquiet over

PIF's first \$3.5 billion mega international investment in 2016 in *Uber*. During 2017, *Uber* was in the headlines over sexual misconduct and other allegations of intellectual property acquisition which led to the departure of senior *Uber* executives and its founding CEO Travis Kalanick in June 2017, resulting in *Uber*'s fortunes to decline as some shareholders opted to sell their equity stake.

While the government stressed that Saudi Aramco will remain a majority-owned Saudi company and that citizens will be given priority for the IPO by offering shares at preferential prices on the Saudi stock market, it also announced a reduction in the company's tax rate from 85% to 50% to make the IPO more attractive to international investors. The loss of tax income would be replaced by "stable dividend payments" and other sources of revenue from hydrocarbon producers to the government. As noted earlier, Statoil's dividend payout policy was made dependent on the performance of the company, and an assured dividend payout was not guaranteed.

Some have argued that there is a difference between *economic diversification* of the wider Saudi economy, which is the stated objective of the reforms, and *financial diversification*, which in fact seems to be the motive of the Aramco IPO proceeds. This in turn has led to a wide range in Aramco's valuation, from an initial figure of \$2 trillion announced by the Crown Prince to lower estimates of around \$420 billion. However, long before a valuation of Aramco can be carried out, several critical issues need to be addressed by the company. These include estimating the size of Saudi Arabia's hydrocarbon reserves, the composition of a future Board of Directors and its accountability to new investors, how to handle Aramco's non-core CSR responsibilities and expanded mandate, and the important question on where to list Aramco. To execute the above, Saudi Aramco has to engage with its internal stakeholders and its employees and at the same time ensure that the company has the management depth to carry out its future tasks.

As noted earlier in the introduction, Aramco prevailed over Petromin and this has brought with it a certain sense of acceptance of the status quo that the company's position is unassailable and that there was little need for drastic changes. As Aramco prepares for the IPO, the issue of the company's senior and middle management and their ability to assume new Aramco roles will become important, given that there will be a change in emphasis from a state-owned and state-led NOC to a partly privatized NOC dealing with multiple stakeholders and regulatory authorities and that at least one, if not two, international listing is sought. The status quo is certainly something that Aramco is not going to assume going forward. For the company this has to involve a change in its business approach and move it toward a culture of profit and loss and bottom-line accountability, as opposed to a cost center management approach given that there is no domestic competition. Sometimes impending change creates a momentum of its own, with some employees opting for early retirement, and Saudi Aramco has to ensure that it can accommodate for the loss of such experienced junior and middle managers.

A successful organization, especially one that is forward looking, often rotates key managers to different functional responsibilities to ensure that they possess a wide range of skills and so better understand other unit's work scope in order to avoid a tunnel vision or for a silo mentality to develop. The review of Saudi Aramco's

senior executives and those that are managing its petrochemical and refinery assets indicates that Saudi Aramco indeed possesses a wealth of highly trained professionals, experienced in both upstream and downstream operations and with many possessing international assignment experience with joint ventures. Aramco's managerial capacities seem unrivalled in Saudi Arabia and put the company on par with some of the most advanced international oil companies as Aramco executives, without exception, are highly educated with engineering backgrounds, complemented with advanced executive management courses. Most also have senior level board experience and acquired exposure for complex operational oversight and strategic transformation tasks.

Possessing an appropriate corporate governance structure is important for any NOC contemplating an international IPO, and Aramco is no exception. This requires such companies to respond to an international listing by enhancing governance mechanisms, such as board monitoring and provision of quality information to convey the company's quality to investors and ultimately improve its stock market value. Chapter 5 highlights various Saudi Aramco board governance mandates and composition, whereby nine member boards currently include senior government officials, the head of KFUPM, and three senior independent board members from the international oil, gas, and finance industry, as well as the company's president and CEO. A comparative analysis of Aramco and the four partly privatized NOCs reveals that Aramco compares well in terms of Board of Director's power, impact, and independent decision-making, but with mixed results in terms of gender diversity (none), disclosure of audited data (none), as well as a budget process that is not separate from the government. Unlike other NOCs assessed, Aramco does not disclose the roles of the different board members and on which board committee they serve, especially the audit committee, and if any of the three independent board members serve on it. These issues will have to be clarified in any IPO prospectus.

Another issue that needs to be addressed by Aramco is the manner by which it will manage and coordinate the activities of its international joint ventures, whether these are wholly owned or in which Aramco holds a minority stake, and the type of delegated authority the Aramco management or board members will have. Above all, Aramco has to deal with how to account for its oil and gas reserve audit, specifically how much lies below ground and how long it will last, as this has intrigued many analysts who argue that actual reserves are lower than those estimated by Aramco at around 266 billion barrels. Others have argued that this is not so important an issue as the key to an IPO valuation is the expected cash flow and not the size of the country's reserves. Assuming the 266 billion reserve figures are correct, then at current production levels of around 10–10.2 million bpd, the Saudi reserves will last for around 65–70 years.

The seemingly unchanged Saudi reserve level has been the main factor for skeptics, as Saudi reserves were abruptly raised to 260 billion barrels from 170 billion barrels in 1987 without much explanation and have remained relatively unchanged since then, even as the country has exported and consumed domestically around 94 billion barrels since 1989. To maintain current reserve figures, Aramco must have either managed to replace each produced barrel with new discoveries or increased

the estimates of the amount recoverable from existing fields, whether from “super-giant” fields like *Ghawar* or from newer discoveries. The problem for obtaining accurate reserve data is that field-by-field production profiles and reserve estimates are not publicly available and are closely guarded state secrets, making it difficult to accurately test or verify the existing country reserves, as the Kingdom provides only general data about its reserves and not for individual oilfields or wells. Some of the more pessimistic production drawdown estimates and forecasted remaining reserves put the remaining Saudi reserves at around 72 billion barrels by 2028.

If no field-by-field historical production data is going to be released by Saudi Aramco, and the likelihood that they are not, then one is left with the methodology to be used by the company in its reserve estimations. Similarly, it is possible to determine what type of definitions will be used to report “proven” reserves, whether these will comply with internationally recognized audit standards, and how to account for “reserve growth” that makes it possible for Saudi Arabia to produce more oil than initial reserve estimates.

As we noted for other NOCs, key criteria for resource classification whether it is under SPE or SEC regulations are the determination of “commerciality” of reserves. To be included in this category, a project must be defined to establish its commercial viability and a “reasonable” time frame for the initiation of the project, with 5 years recommended as a benchmark by the SEC, and a longer time frame by the SPE. As such, if Aramco is considering listing in the New York Exchange, the definition for reserve accounting used by the SEC becomes important and not a mere academic exercise. Listed companies that cannot prove developed fields can be recovered through existing wells, with existing equipment and operating methods, can be forced to write down such reserves by the SEC. This happened to major IOCs like ExxonMobil and ConocoPhillips who took substantial hits to their share value after cutting back on their Canadian oil-sands projects. To prepare for the planned IPO, Aramco has appointed not one but two international reserve auditors, DeGolyer and MacNaughton who were used by four NOCs in our study, as well as Gaffney, Cline and Associates, part of Baker Hughes. According to Aramco, these independent audits have been completed and the results were “definitely not below” those published by Aramco or slightly higher. One has to wait for the fuller audit reserve methodologies used in the forthcoming IPO prospectus, especially if the stricter US SEC definition was the key one applied.

The issue on where to list Saudi Aramco is also addressed in Chap. 5, as media reports have identified several that have been in discussion with Aramco, or in which the company has expressed an interest. These included *New York, London, Hong Kong, Singapore, and Tokyo*, with the local Saudi *Tadawul* Stock Exchange also included. Intensive lobbying has been taking place by many of the abovementioned stock exchanges, with some offering to attract sovereign funds and major financial institutions as stakeholders and others, especially London, proposing some potential reforms to their listing requirements in order for a sovereign-owned national oil company like Aramco to be allowed to list on a “premium” basis rather than on a “standard” listing. Current London Stock Exchange (LSE) regulations would make it hard for Aramco to meet the more stringent premium listing requirements. Whether such an amendment to the LSE regulations will be finally approved

in the face of strong objections by the UK's Investment Association representing the top listed UK companies is still uncertain, as also the prospect to list in New York due to uncertainties over potential litigation lawsuits against Saudi Arabia by survivors of the 9/11 attacks under the *JASTA* Act passed by the US Congress in 2016.

Despite the uncertainties, we conducted a comparative assessment of the key strengths and features of the five potential listing centers to evaluate which of these could best be suitable for a Saudi Aramco listing. Among the criteria used were the number of listed companies, the aggregate market capitalization, the number of IPOs listed over the period 2002–2006, the amount raised, the share of the global IPO raised, and the top listed company on the bourse. In a further comparative exercise, the five exchanges were also ranked in terms of their major strength in listing energy-related companies and the top three sectors for the exchange. London and New York took the lion's share of energy-related listings and IPOs, while Tokyo's strength was in the general industrial sector. Hong Kong and Singapore's core listings were in the financial sector, along with London and New York. The comparative stock market exercise also looked at the detailed listing requirements for each bourse in terms of audited accounts and frequency, board membership and role of independent members, the IPO timeline involved, working capital and asset requirements, and other corporate governance requirements. Saudi Aramco was benchmarked against these requirements to assess which stock exchange had the "lowest" hurdle to cross under a *current and a poststructured Aramco*, and the analysis indicated that the company has a higher probability of being accepted for listing in the Asian stock markets and that London came ahead of New York in a poststructured Aramco setting, assuming that the LSE did manage to change its "premium" listing requirements. If this was achieved, then London would take prime place. Given the Kingdom's desire to seek as wide and diverse an international investor base, then the likelihood is that London and Hong Kong would be the two ideal exchanges for listing.

As part of the IPO preparations, Saudi Aramco has started to take steps to untangle itself from the finances of the Saudi government in how the newly public listed company would pay taxes and how to determine for the various subsidies it receives from the government. In March 2017, the government announced that Saudi Aramco's income tax rate would be reduced to 50% from 85% and that the 20% royalty rate would remain unchanged. According to the company, the decision to cut the tax rate would help bring the company close to international standards, and this was a vital piece of information for potential international investors. However, the issue of what dividend payout rate will be applied by Aramco has not yet been settled. There is some concern expressed that the new tax and yet undefined dividend policy could undermine the company's ability to retain funds following the IPO. More seriously, it would also hamper the state's more stable cash flow based on a higher level of taxes and royalty payments, in favor of undefined and unpredictable dividend payments, which might not offset the 35% cut in the tax rate.

There are several methods of company valuations, and some are more suitable for energy companies, but in essence the valuation of any company consists of a process at estimating its value by using one or more specific methods. The *dis-*

counted cash flow (DCF) is probably the most recognized today, as the main methodological assumption inherent in the application of the DCF is the *operating cash flow* method. A rate used to discount the expected cash flows is the weighted average cost of capital or WACC, which takes into account specific company risks, both operating and financial. Another method is the *economic value added (EVA)* method, but the traditional methods of DCF are commonly applied to an energy company. Calculating an annual cash flow and then subtracting capital expenditures leaves a free cash flow, which when discounted and added up over time leads to a valuation. This is the method applied for our Aramco IPO valuation.

Chapter 5 also addresses the risk factors faced by the company, which are classified under those related to Aramco and its particular industry and business and those related to Saudi Arabia and the wider MENA region. Sometimes risks arise due to unintended consequences, with the 2017 dispute between Qatar and Saudi Arabia, the UAE, and Bahrain of the GCC, as well as Egypt, leading to a rise in the cost of hedging and credit default swap (CDS) rates, not only for Qatar but all the other countries involved. Concerning Aramco's specific risks, these include exposure to fluctuating oil prices, terrorist activities, production capacity, environmental legislation, and the ability of the company to manage large and complex projects. Risks relating to Saudi Arabia are due to slowdown in the economies of the Kingdom's major trading partners, especially Asia, where the Kingdom's main crude and refined products are now directed.

In our Aramco valuation, whatever the value assigned for Saudi Aramco, the results are most sensitive to assumed oil prices in the near and medium term *and specifically whether these prices can be sustained*. As noted earlier, the Kingdom has made it clear that Aramco has to execute the country's OPEC policies and any other international energy undertakings such as the 2016 OPEC and non-OPEC production agreement. A move that sacrifices short-term revenues to boost longer-term geopolitical objectives might be rational for a country but could be negative for investors with higher discount rates and shorter investment time horizons. Bearing this in mind, the valuation of Aramco will necessarily involve, barring financial disclosures by the company, many assumptions on three key variables: *oil prices, oil production, as well as cost of production per barrel*. The above by themselves are not enough, as the company has to also disentangle itself from government finances and obligations such as shifting historical debt from foreign governments from Aramco's accounts to the governments', as well as creating a mechanism to compensate Aramco for the financial cost of subsidizing fuels such as petrol for domestic consumers and gas power for generation, as it is clear that Aramco is owed payments from state entities such as *Saudia* Airlines and the Saudi Electricity Company. All these debts should be removed to the Saudi Ministry of Finance ahead of the planned IPO, so that the company's new audited balance sheet is "clean."

Our valuation was based on two production cost scenarios, with a lower \$6 pb and a higher \$12 pb, with the higher production cost based on the company's publicly disclosed capital expenditure program. The new 50% tax rate and 20% royalty rate were also assumed to remain unchanged, and production was put at 10 million bpd. Oil prices were forecasted in \$5 ranges starting from \$40 pb to \$70 pb, and a

P/E ratio of 10 was also assumed to arrive at Aramco's market capitalization and derive the expected 5% flotation proceeds. In the final step, a discount rate of 10% was used to calculate the company's net present value, based on 60 years of production, given the company's announced reserves. The results clearly indicate the significant impact that changes in forecasted oil prices play in the estimated value of the company, with Aramco's net revenue reaching around \$47 billion per annum at \$40 pb oil prices and rising to \$90 billion per annum at \$70 pb prices. These estimates were using \$6 pb production costs. With oil prices fluctuating between \$45 and \$55 pb levels during 2017, the estimated annual net revenues would be between \$54 billion, \$62 billion, and \$69 billion, respectively. Based on these assumptions, the expected 5% IPO listing proceeds reach \$24 billion at \$40 pb and \$46 billion at \$70 pb, far less than the hoped for \$100 billion based on a \$2 trillion valuation, but still higher than Ali Baba's \$24 billion. Based on a 10% discount rate for 60 years of income, the NPV valuation was \$234 billion at \$40 pb prices and \$406 billion at \$70 pb prices, implying that 5% IPO proceeds would raise under \$12 billion at the lower oil price level and \$20.3 billion at \$70 pb oil prices. The latter figure is in line with other NPV estimations using \$70 pb oil prices, but assuming a higher 85% tax rate, which arrived at \$251 billion NPV or around \$12.5 billion as proceeds from a 5% IPO listing.

Assessing the Aramco IPO valuation based on higher levels of \$12 pb production costs resulted in an even lower range of expected IPO proceeds, with estimated net revenue falling to \$36.5 billion at \$40 pb prices and \$80.3 billion at \$70 pb oil prices. At the median \$55 oil price level, the net annual revenue would reach \$58.4 billion, with \$29.2 billion raised through a 5% IPO and \$40.2 billion at \$70 pb oil prices, again assuming a P/E ratio of 10 for market capitalization. The estimated NPV is also reduced to around \$194 billion at \$40 pb oil price and \$385 billion at \$70 pb, resulting in estimated 5% IPO proceeds of \$9.2 billion and \$19.3 billion, respectively.

The above DCF valuations are based on 60 years of production and the question is raised on whether this is a realistic assumption to make, whereby under the U.S. SEC formula, the value of a barrel of oil which is *not* produced until 10 years from now is discounted by about a 60% discount rate and, if oil is not utilized for 40 years, will shrink by 97.8%. Given these SEC rules, the use of a 10% discount rate for Aramco's future reserve estimates might not be appropriate, but it depends on how oil in the ground is assessed. Is this an *appreciative asset*, potentially gaining more value in the future, more than the foregone opportunity cost of money, or is it a *depreciative asset*? The former assumption is based on higher future oil prices, while the second assumes that future oil prices will decline. Given the game-changing emergence of the US shale oil industry, whereby "tight-oil" is assuming OPEC's traditional swing-producer role, along with long-term climate change pressure to reduce fossil fuel emission, the probability of lower oil prices in the future seems more realistic. However, as both Saudi Aramco's chairman and CEO have stated, neither climate change policies nor technology shifts have quenched the insatiable thirst for oil and current underinvestment amounts to nothing more than compromising the world's future energy security, leading to higher oil prices.

One of the criticisms raised against the planned IPO in Saudi Arabia was that the government would lose revenue by giving up the national “cash cow.” Chapter 5 estimates the annual revenue stream that will accrue to the state and to private investors, based on different oil price scenarios, using the higher \$12 pb cost of production. The government’s royalty and tax rates remain at 20 and 50% levels, and a 15% dividend payout rate was also assumed, distributed on a 95/5% level to the government and private investors, respectively. The estimates for private sector investors’ income also take into account Aramco’s operating annual expenses of \$7 billion pa as the \$12 pb production cost includes capitalization of Aramco’s annual capital expenditure program. The analysis indicates that at \$40 pb oil prices, the government’s share of dividend payment is around \$4.21 billion and \$10.35 billion per annum at \$70 pb oil prices. Private investors’ total income was around \$30 billion pa at \$40 oil price and \$73 billion pa at \$70 oil prices. The corresponding government revenues were \$70 billion and \$142 billion.

Aramco has not announced its future dividend payout policy, but it needs to ensure that it is in line with international energy company dividend rates. As noted earlier, Rosneft’s dividend payout has been set at 35%, which could be at the higher scale for such payments. A comparison with international oil companies’ dividend rates might be more appropriate, given that the high Rosneft payout has most probably been influenced by the Russian government’s need for high budget revenues. BP’s 2016 dividend yield was around 7%, while ExxonMobil’s was 3.7%.

Given potential revenue losses that the Saudi government might incur if the Aramco IPO is carried out when oil prices are under the \$55 pb levels, are there any other alternatives for the government to raise similar amounts as the proceeds of the IPO? One possibility is to raise the same capital through international borrowings similar to the successful Saudi sovereign bond of 2016 and Aramco’s own *Sukuk* borrowing in 2017. An evaluation was carried out in raising the same amounts as the IPO for 10 years, using different oil price benchmarks. The analysis used both the \$6 and \$12 pb production cost scenarios and the respective estimated 5% IPO proceeds. A notional 10 years cost of borrowing was set at 3.75% compared with an actual rate of 3.25% for the 2016 \$10 billion bond. The Saudi sovereign bond order book was the largest in 2016, at \$67 billion surpassing Argentina’s \$16.5 billion. Saudi Arabia raised more in the 30-year tenor than in the shorter 5- and 10-year tenors, indicating that sovereign wealth funds were interested in buying Saudi debt and that the extraordinary size of the order book indicated that there was capacity for Saudi Arabia to raise more capital. Given this appetite for Saudi sovereign debt, it was not a surprise to note that the Kingdom is considering raising international borrowing in Chinese *yuan* currency to diversify its sources of currency borrowing.

From the analysis carried out, and assuming a lower production cost of \$6 pb and oil prices at \$70 pb, the cost of borrowing \$40.2 billion for 10 years is lower at \$15.1 billion in interest paid for the full 10-year period, indicating a saving of \$25 billion over the 5% IPO proceeds. While borrowing on the international capital market is one option, other NOCs in the region are looking at different alternatives to raise capital without selling a stake in the NOC itself. Abu Dhabi National Oil Company (ADNOC) has decided to sell minority stakes in some of its private units to international partners in the refining, petrochemicals, and other areas such as pipelines,

storage, and service stations. At the same time, the Abu Dhabi Company for Onshore Petroleum Operations (ADCO) has sold 40% of its onshore concession to a group of European and Asian energy companies. These types of concession sale agreements ensure that the IOCs are long-term technology partners to national oil companies and that long-term markets are available for their oil exports.

The chapter analyzes various steps that Aramco needs to undertake to launch a successful IPO that meet international investors' needs for detailed information. The IPO process takes into account both a valuation and a pricing process. The initial first value estimation goes through a market demand assessment by Aramco's financial advisors, arriving to a final offer price and first-day market price through trial and error. The valuation and pricing process can take anywhere between 4 and 8 months, and the earlier the preparation starts for the listing prospectus, the shorter the overall process takes. The prospectus contents cover many areas, but the format for many listing exchanges is somewhat similar in that they require information on the company's business overview, organizational and management structure and key personnel, financial performance, accounting policies and basis of preparation, the IT system and backup security, dividend policy, if material litigation exists, and, finally, the terms of the share offering and share capital. Disclosing Aramco's audited financials ahead of the planned IPO will be an important step for the company to take. It was reported that Aramco will disclose its audited 2015–2017 accounts in early 2018 once it decided on a venue for listing, as different venues use different accounting standards such as IFRS or U.S. GAAP. If this happens it would be the first financial public disclosure for the oil giant.

While different options are considered, such as international borrowing in lieu of an IPO, the appointment of Prince Mohammed bin Salman as Crown Prince in June 2017 all but settled the issue on whether Aramco will be part privatized or not, considering the central role the Prince has given to the IPO as part of his Vision 2030 transformation. Despite some media reports of a possible delay of the IPO to 2019 or even its postponement, given the tight self imposed 2018 timetable, the company has restated that the IOPO process is still on track and all options are being studied and also denied that the Chinese will be offered a private placement of the international portion of the IPO. In proceeding with this strategy, it raises some questions concerning Saudi Arabia's future role within OPEC following the part privatization of its NOC. Will Saudi Aramco follow its investor-driven commercial interests, or will it still be part of OPEC/ non-OPEC producer agreements on production quotas that might be detrimental to its profit-maximizing objectives? Will Saudi Arabia still adopt the role of a swing producer post Aramco IPO, or will the Saudi government use Aramco's new commercial status to argue *within* OPEC that it cannot comply with that organization's directives to members to follow and it is harmful to its interests according to Saudi Arabia? Privatizing Aramco can then become a double-edged sword for the Kingdom and raise questions on its OPEC membership as a full member or whether, like Russia, it opts for an observer OPEC member status. The book examines these questions in depth.

Chapter 1

From Infancy to the Global Energy Warehouse: Looking into the Past Is a Guide for the Future

Events of great consequences often spring from trifling circumstances

Livy

How It All Started: The Pioneering 1930s

Today, Saudi Aramco is a fully integrated, global petroleum company and the principal producer of oil and gas in Saudi Arabia. The company has all the attributes of a mature national oil company (NOC), with activities spanning exploration and production, processing and refining of petrochemicals, shipping of crude oil and refined products, distribution of refined products, and services such as storage, finance, insurance, and aviation.

The above did not materialize out of a vacuum as the company has had a long history, spanning decades. It all started from the vision and determination of pioneering Geologists, Engineers, and field teams operating under the most basic field conditions and a harsh environment, but not giving up their search for that elusive “black gold.” In brief, Saudi Aramco’s history officially dates back to 29 May 1933, when Saudi Arabia signed a concession agreement giving Standard Oil of California (SOCAL) permission to explore Saudi Arabia for oil, which was undertaken by SOCAL’s wholly owned subsidiary, California Arabian Standard Oil Company (CASOC). The Texas Company (later Texaco) acquired half of CASOC in 1936, and in 1944 the enterprise was renamed as the “Arabian American Oil Company,” also known as “Aramco.” Standard Oil Company (later Exxon Corporation) and Socony-Vacuum Oil Company (later Mobil) became part owners in 1948 to help provide market outlets and capital investment for the hydrocarbon reserves of Saudi Arabia. In 1952, Aramco’s headquarters moved to Dhahran, Saudi Arabia (Stegner 2007). In 1973 the Saudi Kingdom acquired a 25% share of Aramco, increased this to 60% in 1974, and finally acquired full control of Aramco by 1980. In 1988, a Royal Decree established the successor company to Aramco in 14 November 1988 to be operated on a for-profit basis, as the Saudi Arabian Oil Company, also known as “Saudi Aramco” (Saudi Aramco, *Sukuk Prospectus*, 21 March 2017c, p. 31). The changes in ownership are reflected in the various corporate logo designs illustrated in Fig. 1.1.

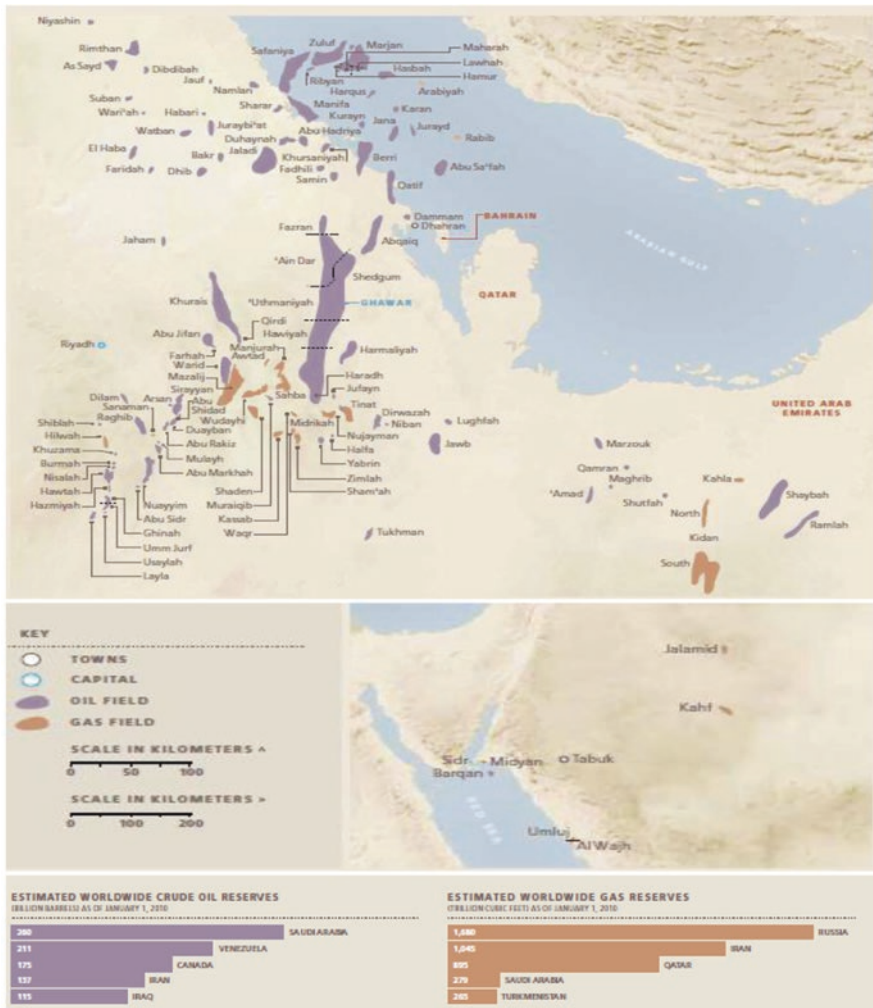
Fig. 1.1 Evolving Aramco corporate identities. (a) Arabian American Oil Company (Aramco) (1946–1988). (b) Saudi Aramco (1989–1999). (c) Saudi Aramco (2000)



Source: Saudi Aramco (2011b). Energy to the World. The Story of Saudi Aramco. Volume 2. p. 137

The latest corporate logo, introduced by former Aramco CEO Abdullah Juma'h, was to celebrate the new millennium, and, according to Mr. Juma'h, it symbolized an “energy burst that represented not only our company’s commitment to meet the energy needs of the world, but also the human energy, mobilized through team work that has propelled Saudi Aramco into the new century” (Saudi Aramco 2011b, p. 137). That promise of a “burst of energy” has indeed been met as the company prospected, drilled, and developed numerous new oil and gas fields in the Kingdom, illustrated in Fig. 1.2.

Fig. 1.2 Saudi Aramco operational oil and gas fields and estimated reserves. 2010



Source: Saudi Aramco (2011b, p. 175)

From almost negligible oil production levels first struck from “lucky” well No. 7 in Dhahran at the rate of 1585 bpd on 4 March 1933, after geologists nearly gave up in despair at ever finding commercial amounts of oil, today Saudi Aramco produces over 10 million bpd, with estimated oil reserves of 266 billion barrels of oil and 297 trillion standard cubic feet (scf) of gas. According to the company, it produced during 2016 an average of 10.5 million bpd and processed 12.0 billion scfd (Saudi Aramco, 2017e Annual Review, pp. 19, 20). This truly astonishing increase in production over the years is illustrated in Fig. 1.3, with 1946 being the first year of viable commercial production of around 161,000 bpd.

Fig. 1.3 Saudi Aramco production history 1936–2010 crude oil and natural gas liquids (average daily production, thousands of barrels)



(Average daily production, thousands of barrels)

Source: Saudi Aramco (2011b, pp. 200–201)

The vision and determination of Saudi Arabia's founder and first King Abdul-Aziz bin Saud to consolidate the territory under his new Kingdom and provide for his subjects was the driving political force to start the Aramco story, with the King's overriding objectives being public security, public health, and economic prosperity (Almana 1982; Facey et al. 2006; Lacey 1981). These early visions and objectives for Saudi Arabia still have a resonance with the modern Vision 2030 goals set out by the King's grandson Crown Prince Mohammed bin Salman bin Abdul-Aziz in 2016. King Abdul-Aziz, or Ibn Saud as the West knew him, fully understood the geopolitical rivalries between the "old" British Empire and the emerging "new" power of the USA, and he bet on the latter to lay the foundation of the Saudi oil sector (Rihani 1928; Dann 1988; Anderson 1981). To achieve his goals, the King's mission was made easier through the dedication and vision of some of the early pioneers who also "bet" on Saudi Arabia. It was pioneers and believers like Frank Holmes, the "father" of the Saudi Arabian Oil Company, Charles Crane, and Geologists Dr. Arnold Heim, Bert Miller, and the legendary Max Steineke, who is honored by having one of Saudi Aramco's guest houses named after him, that made this possible, especially Max Steineke who continued to have unflinching faith until well No. 7 struck oil (Cheney 1958; Hamilton 1962; Twitchell 1947; Hapgood 2000). Sadly, Max Steineke died in 1946 following an injury sustained in Saudi Arabia and did not live long enough to see the birth of the largest oil field in the world, the "supergiant" *Ghawar* field, but which he had surveyed (Lebkicher et al. 1952; Longrigg 1954). After intensive negotiations and revisions of final payment terms, the Saudi Finance Minister Abdallah Al Sulayman and SOCAL's Attorney Lloyd Hamilton signed the Kingdom's first concession agreement on 29 May 1933. The concession area covered 829,000 square kilometers and was for 60 years for a yearly £10,000 payment in silver rupees. The historic agreement is illustrated in Fig. 1.4.

Fig. 1.4 Saudi Arabia’s first concession agreement with SOCAL on 29 May 1933



Source: Saudi Aramco (2011a, Volume 1, p. 56)

For the Saudi side, a future King, Faisal bin Abdul-Aziz who was then a Foreign Minister, signed the concession on behalf of his father, King Abdul-Aziz. Following the concession, oil production continued to rise, and on 1 May 1939, King Abdul-Aziz celebrated the loading of the first oil tanker at *Ras Tanura* by personally opening the valve to enable oil to flow to the SOCAL tanker *D.G. Scofield*. The turning of the value has been likened literally and figuratively to connect Saudi Arabia to the industrialized world, with the hope that Saudi oil would quickly bring wealth and a better life for the Saudi people. Some 78 years later, the production of specialized chemicals from the SADARA petrochemical complex – the largest in the world – promises to do the same under another generation of Saudi rulers. The wheel of history had turned.

The concession payment terms came under pressure with increased revenue needs of the new Saudi state. The Government of Saudi Arabia started in 1950 to negotiate for a new agreement based on a 50/50 royalty split, as they noted unfair

tax balances going to the US Treasury paid for by Aramco. By 1951, the Kingdom saw its tax and royalty income from the company jump to \$103 million compared with royalty payments of only \$37 million in 1949. As will be discussed in later chapters, Saudi Aramco’s tax rate, which had reached 85% under the fully nationalized company, was reduced back to the 50% level in 2017 to prepare for the planned IPO of Saudi Aramco.

The period of the 1950s and the early 1960s was one of resource nationalism for many oil producers. In Saudi Arabia one ardent advocate was Abdullah Al Tariki, who was appointed Director General of Petroleum and Minerals Resources in 1954 and became the Kingdom’s first Minister of Petroleum and Minerals Resources upon the creation of the Ministry in 1960. He then continued to push for greater sharing of information between Aramco and the government, as well as a more equitable financial arrangements between the two. He also took a strong interest in the welfare and compensation of Aramco Saudi employees. In 1960, Tariki took part in the creation of the Organization of the Petroleum Exporting Countries (OPEC) (Ghosh 1983; Edens 1979).

From the “Seven Sisters” to Saudi Hands: 1950s–1980s

Saudi Oil Minister Abdullah Al Tariki served until 1962 when Zaki Yamani replaced him by the then Crown Prince Faisal. Until then, Tariki was the principal driver of Saudi oil policy. In many respects he seemed to have been ahead of his time, as in early 1961 he advocated converting Aramco into an integrated oil company that included marketing as well as refining and declared that Aramco should cease the flaring of any natural gas produced in association with crude oil. Instead he favored the development of a petrochemical industry using Saudi natural gas and crude oil as feedstock (Saudi Aramco 2011a, Volume 1, p. 6). His vision for Aramco could as well have been written today as Saudi Aramco’s 2017 objectives.

History though was not on his side, as by the late 1950s, Saudi oil revenues were insufficient to cover increasing budget deficits, taking Saudi Arabia to the verge of bankruptcy under King Saud. The government owed nearly SR1.25 billion in foreign debt and SR600 million to domestic creditors, leading King Saud to grant in 1958 Crown Prince Faisal full executive powers in financial, internal, and foreign affairs. The empowered Crown Prince introduced sweeping economic and political reforms, negotiated with Aramco to guarantee and renew \$92 million in loans the government had arranged with US banks to keep the Kingdom afloat, revamped the government structure, and insisted on strict financial austerity, cutting government and royal family spending and publishing a state budget (Saudi Aramco 2011a, Volume 1, p. 6). Fast forward to 2016, the institutional and economic reforms initiated by Crown Prince Mohammed bin Salman and the launch of his National Transformation Plan 2020 and Vision 2030 are eerily reminiscent of those earlier days, except that in 2016 Saudi Arabia possessed healthy financial reserves in excess of \$550 billion. The overriding aim in 2017, to be discussed in greater detail in later

chapters, was to wean the Saudi economy *away from oil* dependency, while Crown Prince Faisal bin Abdul-Aziz's main concern in the late "1950s" was to effectively rationalize Saudi oil revenues and reduce waste in expenditure.

As the 1970s began, Aramco's foreign shareholders and other major global IOCs held to the position that they remain in control of oil prices, as OPEC had been in existence for a decade and had little to show of its strength and impact on world oil prices. OPEC took over a world petroleum order that was in a long state of stability in the period prior to 1973 under the former structure of the "Seven Sisters" (*Esso, Mobil, Gulf, Shell, BP, Texaco, and SOCAL*). As noted earlier, the Standard Oil Company of California (SOCAL) obtained a concession in Saudi Arabia in 1936, Texaco joined in the same year, and in 1948 Standard Oil of New Jersey and Mobil also joined. It was in Saudi Arabia in 1950 that the principle of a 50–50 profit sharing was implemented in the Middle East between oil companies and their host countries. Under these so-called oil concessions, the oil companies had the sole authority to decide upon the volume of production, the price, and the destination of oil exports. Most of the laws, taxes, and regulations of the country were not applicable to the companies (Ghanem 1986, p. 11). In essence, the sovereignty of the producing countries was overridden when the governments agreed that they could not change any clause in the law or the concession without the prior consent of the oil company concerned.

A major feature of the period prior to 1973 and the first Arab oil embargo was that while the various companies of the "Seven Sisters" competed with each other in the downstream sector, they were able to cooperate both vertically and horizontally in the upstream production sector. A second major feature of the system was that these companies were locked in partnership relations to jointly develop oil resources in the Middle East (Sampson 1976). The most important aspect of that structure was that the companies did not use or take advantage of the system to target higher oil prices, unlike their host countries' desire for higher price and oil revenues (Parra 2004).

The 1970s proved to be a time when Aramco's ability to serve the interests of both its shareholders and the Saudi government was strained almost to breaking point due to several factors. The issue of serving "two masters" will be explored further in the book, when we analyze how partially privatized NOCs which still retain major government shareholdings try to meet conflicting objectives, as this will be a major issue for the planned Aramco IPO to address. Major sources of tension between the two parties were the "Seven Sisters" system of *posted* oil prices and the structure they put in place that helped the world economy to enjoy a period of healthy growth rates in the years between 1950 and 1973 at very stable and low prices. The world's oil consumption was growing at around 7% per annum for the 20 years since 1970, and stability in oil prices was a fundamental factor (Parra 2004).

Prior to 1973, there was frustration with OPEC's lack of cohesion in facing oil companies setting of *posted* oil prices, as opposed to *spot* market prices, and Saudi Oil Minister Zaki Yamani led the formation of the Organization of Arab Petroleum Exporting Countries (OAPEC) in 1968. This initially included Saudi Arabia, Kuwait, and Libya to give leading Arab oil producers more control over their fate

(Robinson 1988). Despite Mr. Yamani’s proposal for a modest 9 cent, a barrel increase over \$3.011 per barrel posted prices, and arguing that he could get the rest of OPEC to hold prices at that level if Aramco’s shareholders agreed, this was rejected by the Aramco shareholders and the standoff continued (Robinson 1988). The situation could not be sustained, and in 1970 Libya was the first OPEC country to initiate a price hike and imposed output restrictions on foreign oil producers. By September 1970, American-owned Occidental Petroleum Company agreed to higher prices, breaking the oil industry’s unified front, and other independent oil companies and major producers followed suit by raising posted prices (Marcel 2006; Abrams et al. 1981).

The 1973 war and the Arab embargo on countries supporting Israel was a significant turning point for oil producers and for the Kingdom, as oil shortages and panic buying led OPEC to take over the role of setting posted prices from oil companies and put an end to the post-Second World War system (Dajani and David 1985). While there were incidents of labor strikes by Saudi employees during 1945, 1948, and 1953, these either related to improving the pay and work conditions of Saudi workers or in Arab solidarity for the 1948 Palestine war. The events of the 1973 war and perceived US collusion with Israel led to some violent protests, mostly organized by students from the nearby College of Petroleum and Minerals (CPM), the forerunner of King Fahd University of Petroleum and Minerals (KFUPM), but these quickly subsided (Saudi Aramco 2011b, pp. 21, 22). The CPM was the brainchild of Zaki Yamani, who wanted it to be more than a mere technical institute but to adopt a wider curriculum and train Saudis who would eventually run Aramco, and was one of the reasons the college was kept under the administrative wings of the Ministry of Petroleum and Minerals and not the Ministry of Education until the mid-1970s. Zaki Yamani’s vision bore fruit as many of the past and current Aramco Managers are graduates of CPM and later KFUPM.

Prior to the 1973 war and embargo, the Saudi government, through its Oil Minister Zaki Yamani, was determined to increase the participation level of producers, not only for the Kingdom but also for other Arab producers. By October 1972, following intensive negotiations, a pact was agreed by the oil companies and signed by Saudi Arabia and Abu Dhabi in Riyadh on 20 December 1972 effective 1 January 1973. The effect of the 25% Saudi ownership reduced the percentage held by the four existing shareholders, with Exxon, Texaco, and Chevron now owing 22.5% and Mobil 7.5%, with a supposed Saudi ownership participation to incrementally increase to 51% by 1981. The 1973 embargo, however, sounded the death knell to the 1972 participation agreement, and in 1974 the Saudi government’s participation in Aramco went to 60%, given that fellow OPEC member Kuwait announced its own 60% participation, and other OPEC members were pressing for complete nationalization immediately (Vitalis 2007; Marcel 2006).

The 1980s were a crucial period in the transformation of Aramco, as the Saudi government assumed full ownership of the company in 1980, and the transformation continued when Ali Al Naimi assumed his duties as President of the Company in 1988 as part of the company’s career development and *Saudization* program. The story of Al Naimi’s rise from a Bedouin shepherd boy to President and CEO of

Aramco, and later Minister of Petroleum and Mineral Resources, was an extraordinary one and best illustrates the company's contribution to the human capital transformation of Saudi Arabia, and many others achieved similar success stories (Al-Naimi 2016).

Despite producer countries apparent successes in raising both prices and their stake in the operating oil companies, OPEC members were never able to reach a level of cooperation that was needed to ensure that they controlled, to some extent, market forces. The "Seven Sisters" were better in keeping the market well supplied, and they were able to compensate for any supply loss or disruption from a member country of the group without engaging in a bitter market-share struggle. OPEC members, on the other hand, seemingly worked against each other due to geopolitical rivalries and lacked the vertical and horizontal integration that the "Seven Sisters" had (Sampson 1976). The results of OPEC's lack of coordinated and verifiable production or agreement cuts led to periods of high and low prices. Periods of high-oil prices also led to demand destruction and ultimately unleashed non-OPEC supply forces, especially US shale oil whose consequences are still being felt in 2017. OPEC had made an endeavor to be the world's "price setter," but it was not successful in the end, as its members lacked the required fiscal and production discipline to allow them to achieve any common desired price level. These issues led to Saudi Arabia adopting different production policies in the new millennium, from pursuing a production strategy to ensure that it does not lose market share during 2014/2015 to a cooperative quota-based production strategy, not only between OPEC members but also with non-OPEC producers from late 2016. However, neither policy achieved its aim of either knocking out high-cost competitor producers nor in bringing about a stable and relatively high-oil price level. Today's Saudi Aramco management is faced with the same policy dilemmas, except that the planned company IPO has added a new external element that cannot be totally controlled.

Leading Aramco: Different Managers, Different Challenges, and Different Objectives

Since its establishment in 1933 to date, Aramco has witnessed different ownership structures and different Managers with different challenges and objectives facing them. Some Managers spent decades with the company and left an indelible mark, while others served for a few years without having made much of an impact. Table 1.1 sets out the names of these who steered Aramco from those early pioneering days to date.

Table 1.1 Aramco's company leadership 1940–2017

CEO's	Presidents	Chairmen of Board of Directors
• Henry Collier 1940–1941, 1944–1951	• Fred Davies 1940–1947	• R. C. Stoner 1943–1944
• R. C. Stoner 1941–1944	• W. F. Moore 1947–1952	• Harry Collier 1944–1951
• William Rodgers 1951–1952	• Robert Keyes 1952–1957	• William Rodgers 1951–1952
• Fred Davies 1952–1959	• Norman Hardy 1958–1959	• Fred Davies 1952–1959
• Norman Hardy 1959–1961	• Thomas Barger 1959–1968	• Norman Hardy 1959–1968
• Thomas Barger 1961–1969	• Robert Brougham 1968–1969	• Thomas Barger 1968–1969
• Robert Brougham 1969–1970	• Liston Hills 1969–1971	• Robert Brougham 1969–1970
• Liston Hills 1971–1973	• Frank Jungers 1971–1973	• Liston Hills 1970–1973
• Frank Jungers 1973–1977	• R. W. Powers 1973–1978	• Frank Jungers 1973–1978
• John Kelberer 1978–1988	• Hugh Goerner 1978–1983	• John Kelberer 1978–1988
• Ali Al Naimi 1988–1995	• Ali Al Naimi 1984–1995	• Hisham Nazer ^a 1988–1995
• Abdullah Juma'h 1995–2008	• Abdullah Juma'h 1995–2008	• Ali Al Naimi ^a 1995–2015
• Khalid Al Falih 2009–2015	• Khalid Al Falih 2009–2015	• Khalid Al Falih ^a 2015–
• Amin Al Nasser 2015–	• Amin Al Nasser 2015–	

Source: Saudi Aramco (2011b, Volume 2, pp. 204, 205)

^aMinisters of Petroleum and Mineral Resources until 2015, then Minister of Energy

From Table 1.1, the dual function in serving as both CEO and President of Aramco started with Mr. Ali Al Naimi in 1988 and has continued with his successors since then. Before the *Saudization* of these top positions, it was somewhat common to have an Aramco CEO also serve as Chairman, with Frank Jungers, John Kelberer, William Rodgers, and Liston Hills being most prominent. Since 1988, the Chairman of the Board of Directors of the company has been serving Saudi Ministers of Petroleum and Minerals (Hisham Nazer, Ali Al Naimi) and since 2015 the current Minister of Energy Khalid Al Falih. Despite his active role in Saudi energy policy in the 1970s, Saudi Minister of Petroleum and Minerals Zaki Yamani never served as Aramco Chairman due to reasons discussed later.

While the first Saudi CEO, Ali Al Naimi was appointed in 1988 to the position, the former Saudi Minister of Petroleum and Minerals Abdullah Tariki was elected as one of the first two Saudis to the Aramco Board of Directors in 1959 when he was Director General of Petroleum and Mineral Resources. The second Saudi appointee

was Mr. Hafiz Wahbah, an Advisor to the late King Abdul-Aziz and a former Envoy to the UK (Saudi Aramco 2011b, p. 211). By all accounts, the American CEOs who made the most impact were Thomas Barger (1961–1969), Frank Jungers (1973–1977), and the last American company CEO John Kelberer (1978–1988). This is not to underestimate earlier company management, especially those serving during the uncertain and hostile operating environments of the 1940s and 1950s, but the above three American CEOs steered Aramco and set new objectives which changed the character of the company (Hamilton 1962; Vitalis 2007). One thing that these three had in common was their commitment to nurture Saudi management talent and promote local employee welfare.

While steering Aramco through the tumultuous 1960s, with resource nationalism feelings running high, Thomas Barger laid down some guidelines for Aramco which helped to keep the company management focused. In 1961, he set down his objectives, many of which, if not all, still resonate with today's Saudi Aramco management and have stood the test of time. These are listed in Table 1.2.

Table 1.2 CEO Thomas Barger's "12 Planning Guides for Aramco as a Corporation," 1961, and their relevance for Aramco in 2017

12 Planning Guides – Thomas Barger, 1961	Applicability and relevance to Aramco 2017
1. <i>To preserve the Concession and optimize the returns to the Shareholders over the term of the Concession</i>	• Will become applicable post IPO for the government and private investors
2. <i>To maximize Saudi participation in the economic support of the enterprise</i>	• Applicable
3. <i>To ameliorate the impact of the enterprise on Saudi society</i>	• Applicable
4. <i>To provide technological and managerial assistance to the society and economy of Saudi Arabia, especially in the Eastern Province</i>	• Applicable, especially in CSR initiatives
5. <i>To carefully evaluate side effects of Aramco actions, before they take place, and ensure that expenditures of money or good will do not outweigh returns expected</i>	• Applicable. Safety, health, and environment are major Aramco goals
6. <i>To spread economic benefits of the enterprise as widely through the local population as possible even at some extra cost by adoption of policies that direct the purchasing power of Aramco employees to the development and support of services generally available to the public</i>	• Applicable. The Saudi Aramco local content IKTV program is a major initiative
7. <i>To set standards of behavior that are in accordance with best industrial practice in the United States, and standardize conduct of the affairs of the Corporation in respect to the treatment of employees, and relations with the Government and public that corporate actions can be always justified to a reasonable Saudi acquainted with business practices elsewhere</i>	• Applicable. Internal governance and ethics policies are in place

(continued)

Table 1.2 (continued)

12 Planning Guides – Thomas Barger, 1961	Applicability and relevance to Aramco 2017
8. <i>To ensure the provision in the Corporation of competent technical, managerial, administrative and craft skills</i>	<ul style="list-style-type: none"> • Applicable. Saudi Aramco provides extensive in-house and external training and management skills courses
9. <i>To keep abreast of technological advances in oil fields bearing on the business of the Corporation and apply new techniques as they can contribute to the efficient operation of the Corporation</i>	<ul style="list-style-type: none"> • Applicable. Saudi Aramco is at the forefront of R&D research and patent commercialization
10. <i>To do what we reasonably can to obtain better mutual understanding between Saudis and Americans</i>	<ul style="list-style-type: none"> • Applicable/Saudi Aramco maintains good relations with the USA and other partner companies
11. <i>To plan facilities so as to insure reasonable protection against unforeseen contingencies, industrial or political</i>	<ul style="list-style-type: none"> • Applicable. Saudi Aramco has advanced risk mitigation and backup systems
12. <i>To be informed and alert to social and political change in order to adapt the Corporation's activities, but not to direct or influence other than normal industrial necessities will inevitably influence</i>	<ul style="list-style-type: none"> • Applicable. Saudi Aramco does not play a political role but provides feedback to the government through its Board of Directors and Chairman

Source: Saudi Aramco (2011b, Volume 2, p. 6)

While Barger was appointed CEO in 1961, he had previously been named President and had a long history with the company, first joining in 1973 as a Geologist. Over his long period of service, he brought to the CEO position wide-ranging interests and a genuine concern for the welfare of Saudi employees and the country in general. He was one of the first CEOs to improve employee medical facilities and the employee home ownership program, something that still continues to this day. He also aided local businessmen to deal with Aramco to “localize” local content purchasing and encouraged entrepreneurship. It is worth noting that many of the well-known family businesses that exist today like *Abdullah Fouad*, *Ali Tamimi*, *Suliman Al Olayan*, and *Abdallah Al Matrood*, to name but a few, started their local businesses during Barger’s tenure (Lacey 1981; Field 1985). The market Aramco provided was a powerful incentive for such Saudi entrepreneurs, who were willing to take risks. The same spirit continues in 2017, given the importance that the Saudi Vision 2030 places on the Saudi private sector to become the “engine of growth.” While Berger was very involved in day-to-day operations, he also groomed future company leadership to assume responsibility, including Saudis. He also kept his sense of humor and reportedly told a friend after being named President of Aramco that “the day a man becomes president of a company is the last day he knows what’s going on in that company” (Saudi Aramco 2011b, p. 3). Educational opportunities within the Kingdom continued to expand dramatically during the 1960s, and Aramco played an important role in building elementary schools for both

boys and girls as well as paying for recruiting and training of female teachers for the girls (Symonds 1993; Viola 1986). Barger, long before the concept was widely known, enshrines these CSR responsibilities, in his second and third “planning guidelines” outlined earlier.

Frank Jungers’ company leadership as CEO spanned the difficult period for the company from 1973 to 1977 as noted before, and Jungers was involved in these dramatic events like the 1973 embargo and agreements to raise the Saudi government’s stake in the company. During his leadership, Aramco developed the system to capture, rather than flare-off, the natural gas produced with crude oil and uses it to fuel domestic industrialization, as well as the drive to integrate and enhance electric power generation in the Eastern Province. The continuing tension between the CEO and the shareholder controlled Board of Directors played a major part in his decision to resign at the young age of 51, but in his own words, “the development of Saudis was my major accomplishment, because that had a lasting impact (Jungers 2013).” The staunch stance for the development of the Saudi workforce and their training was his legacy, as he believed in “true *Saudization*” and accurately forecasted that increased government participation in the company could only accelerate demand for skilled and senior level Saudi management. During Jungers’ tenor as CEO, the first Saudi was appointed as a Vice President of Aramco in 1974.

The company leadership under the last American CEO John Kelberer (1978–1988) was a crucial period in the transformation of Aramco, as the Saudi government assumed full ownership of the company in 1980. However, to allow for continuity in senior management until a Saudi CEO took over, John Kelberer remained as CEO. During his leadership, the most notable event was the creation of the Exploration and Petroleum Engineering Center (EXPEC), which enabled Aramco to consolidate all of its high-tech exploration and petroleum engineering functions in the company’s headquarters. This had previously been undertaken in the USA or Europe. By 2017, as will be addressed in later chapters, Saudi Aramco had developed multiple R&D centers not only in the Kingdom but also internationally. While Kelberer was the Aramco CEO, the appointment of Ali Al Naimi as President during the period 1984–1988 had been one in preparing Mr. Naimi to take over as CEO in 1988, and the R&D transformation continued under him. The early 1980s was a boom period for Aramco, and under Kelberer and later Ali Al Naimi, the company embarked on a large-scale *Saudization* and hiring program and introduced a “College Fast Track Program” in 1979 and intensified its pursuit of Saudi college graduates. In 1979, the company hired 124, in 1980 it hired 203, and the 2-year total *exceeded* the total number of Saudi college graduates hired by Aramco in the previous two decades (Saudi Aramco 2011b, p. 11).

The appointment of Ali Al Naimi as CEO in 1988 brought with it not only the first Saudi CEO but also a name change. In November 1988, the Saudi Council of Ministers approved the Charter of a new national oil firm – the *Saudi Arabian Oil Company or Saudi Aramco* – to assume the responsibilities carried out by Aramco on behalf of the government. While the name “Aramco” used by itself no longer accurately reflects the ownership of the company, it was retained to ensure continued name recognition as well as preserve a link to the company’s rich heritage, as it

takes decades to develop a successful brand name. Today the name, whether “Aramco” or “Saudi Aramco,” is instantly recognized worldwide.

Ali Al Naimi’s major contribution as CEO and President of Aramco was in driving forward his vision that the company should be more of an integrated petroleum company, rather than mostly an “upstream” petroleum producer. Aramco needed to diversify into “downstream” activities, which included international refining and marketing of petroleum products. During his tenure, domestic refineries were expanded, and new ones launched such as the *Ras Tanura* refinery, and the drive to increase Saudi Arabia’s nonassociated gas production accelerated, as well as the first major exploration in the *Shaybah* fields. In 1995, Al Naimi was appointed as Minister of Petroleum and Minerals Resources, a position he was to hold for 20 years. His appointment led to Abdullah Juma’h taking over as President and CEO.

Mr. Juma’h was not a “typical” Senior Aramco Manager compared with his peers who had engineering backgrounds and was the first company President to hold a degree in political science, as well as advanced executive management programs from institutions like Harvard University. Juma’h intuitively understood that the true core of Saudi Arabia was its people and focused on the human side of the business to go beyond technical problems, by wanting to “let the genie out of the bottle . . . and let the brainpower of the company to be released” (Saudi Aramco 2011b). This is not to state that Juma’h did not embark on new engineering objectives, as during his leadership computing power, 3D seismic imaging technology and horizontal drilling took off, which helped to develop the latest Aramco mega oil field *Shaybah*. To put this in perspective, *Shaybah* holds around 14 billion barrels of oil, equivalent to the entire North Sea reserves, as well as 25 trillion cubic feet of natural gas.

Mr. Khaled Al Falih took over as President and CEO of Aramco from 2009 to 2015 and remains close to the company’s strategic objectives as he is currently also Aramco’s Chairman. Expanding internationally, deepening the plastics and petrochemical value added chain, and diversifying Aramco’s mandate in noncore activities, such as civil engineering projects, have been a hallmark of his leadership. Domestically, Saudi Aramco’s corporate social responsibilities and role in education, health management, and overseeing mega government projects like establishing KAUST University took place. A third generation *Aramcon*, Nadhmi Al Nasr was appointed as KAUST’s first interim President in 2006 before he assumed a permanent position as EVP Administration and Finance with KAUST. The pivot to Asia was accelerated, with joint-venture projects in China, as well as initiatives in exploring for nonconventional or “shale” gas reserves in the Kingdom. World-class petrochemical projects like SADARA with Dow Chemical and SATORP with Total were initiated. Mr. Falih’s previous experience as Head of New Business Development responsible for overseeing the earlier Aramco gas initiative assisted him in this new area.

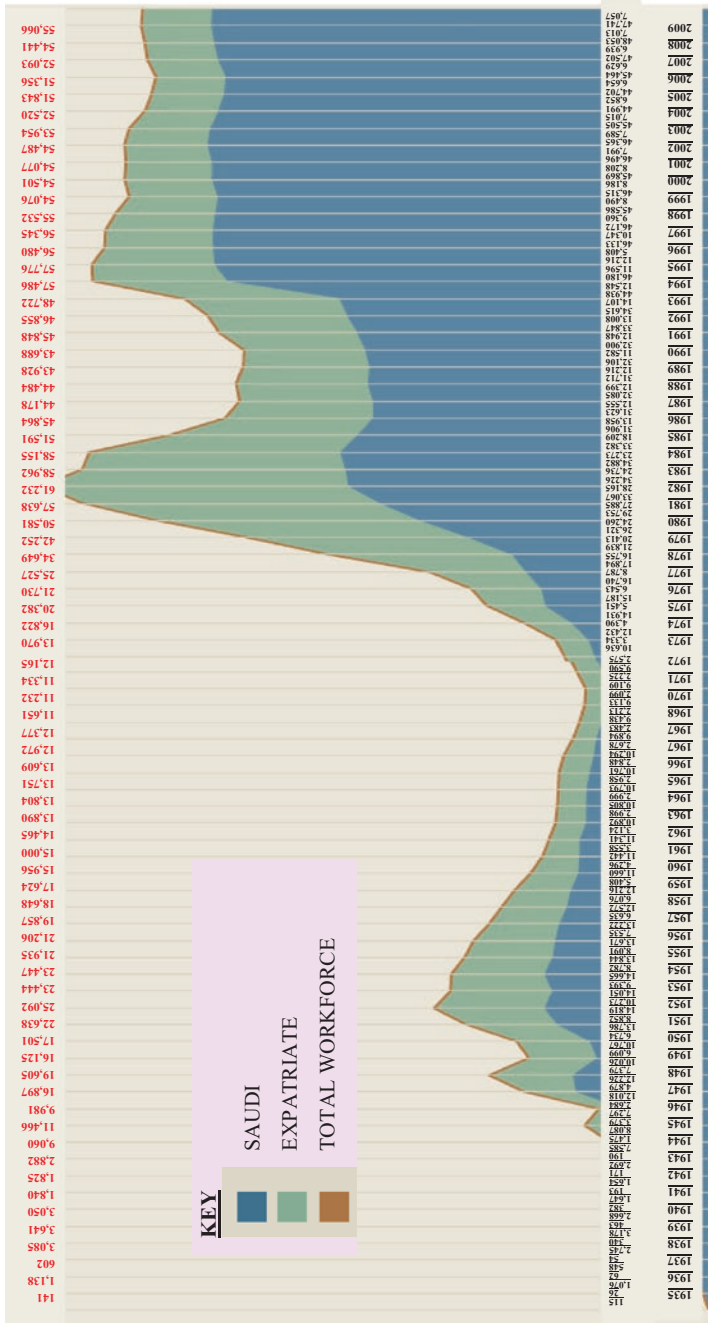
The current President and CEO Mr. Amin Nasser is now in charge of a company that is focusing on meeting its biggest challenge for decades – how to transform the company from being a wholly owned NOC to one that is partly privatized, accountable to external shareholders and international regulators. The planned IPO is being

undertaken under his watch. This will involve not only preparing due diligence documentation and technical data on issues like the size of Saudi oil reserves but, more crucially, ensuring that Aramco's employees are fully committed to and "buy-in" to the ownership change, reversing the Saudi nationalization decision of 1980. Other issues that he will face are continuing with the company's R&D initiatives, expanding cooperation with SABIC in developing oil-to-gas initiatives for petrochemical production, and being at the forefront of Saudi Arabia's knowledge-based economic transformation, something that his predecessor Mr. Khalid Al Falih was fully committed to. Ensuring that Saudi Arabia maintains a sizeable spare capacity, despite oil "peak demand" predictions and supply disinvestment, as well as climate change challenges will also be major issues that Mr. Nasser faces.

Increasing Saudi Workforce Participation

One of the common themes that all Aramco senior management had faced was to increase the number of Saudis employed by the company, as well as grooming a future generation of leaders, both men and women (Pledge and Tahlawi 1998). Figure 1.5 illustrates the growth in the company's workforce from 1935 to 2010, broken down by Saudi and expatriate labor.

Fig. 1.5 Saudi Aramco workforce history by Saudi and expatriate workers (year-end 1935–2010)



Source: Saudi Aramco (2011b, Volume 2, pp. 202–203)

According to Fig. 1.5, Aramco's workforce rose from almost a negligible 141 employees in 1935 to 54,706 by 2010, with the Saudi workers representing 47,741 or around an 86% *Saudization* rate. According to Saudi Aramco, the total workforce was 65,282 at year-end 2016, of which Saudis accounted for 55,466 or around 85% (Saudi Aramco 2017e, Annual Review 2016, pp. 58, 59). Figure 1.5 also illustrates that hiring and employment patterns mirrored the fortunes of oil markets and global economies, with the sharpest rise in the workforce taking place in the post 1973 higher oil price era. *Saudization* reached high levels under both the Frank Jungers and John Kelberer eras, leading to today's record numbers under the new company CEO Amin Nasser.

While there is no breakdown for female employees in Fig. 1.5, according to earlier data for 2010, Aramco employed 1100 Saudi women as full-time employees, including more than 750 who had college degrees and more than 1300 women as supplemental or contractors with the company. These female workers represented around 5% of the total Saudi workforce. Joining Aramco and rising to senior management position has not always been easy for Saudi females. The first professional woman with a college degree to join Aramco was Ms. Najat Al Hussein in 1964 when Thomas Barger was CEO. Ms. Hussein's father was Col. Ibrahim Al Hussein, Advisor to Prince Abdullah bin Abdul-Aziz, Head of the National Guard and a future King, who interceded with King Faisal on behalf of Ms. Hussein, who held a college degree from Damascus University. Ms. Najdat's five brothers, Ihsan, Hassan, Haitham, Moujahed, and Sadad, also joined Aramco, with Moujahed and Sadad gaining Ph.D. degrees in geology and geophysics from Brown University in the USA and reaching senior positions with the company. Along with Abdullah Juma'h, Dr. Sadad Al Hussein was one of the four Executive Vice Presidents of the company responsible for exploration and production, when a decision was being made to replace Ali Al Naimi with a new CEO from among the four Executive Vice Presidents.

There have also been other notable Saudi Aramco female Managers who have set an example to future generations, including Ms. Naila Mousli, Aramco's first female Petroleum Engineer, who was also the company's first female Manager of Reservoir Engineering in the 1980s; Ms. Nabilah Al Tounisi, who was Director of Engineering and Aramco's Senior Engineer; Ms. Huda Al Ghoson, General Manager of Aramco's Training and Career Development; Dr. Thuraya Al Arrayed, who made a career in Aramco public affairs; Ms. Ameera Al Mustafa, Senior Geophysicist; Ms. Sheila Al Rowaily, Senior Manager in the Treasury Department; and Fatema Al Awami, a Petroleum Engineer who was one of the developers of the Event Solution, an innovative multidisciplinary approach to resolving reservoir management issues, to name but a few. Under the newly appointed Saudi CEOs, Saudi Aramco has been actively encouraging and promoting more Saudi female workforce diversity as one of its key human resource objectives.

Aramco was also unique in the Kingdom to have different generations of the same family join the company and progress to senior positions. Among such *Aramcon* families are the *Al Khowaiters*, *Al Nasrs*, *Nawwabs*, *Al Buainains*, *Majeds*, *Dhubaibs*, *Abdelkareems*, and *Rammahs*, and many other sons and daughters followed their fathers to join Aramco but were accepted based on selection and merit and not nepotism, unlike many other Saudi organizations, where the use of *wasta* or connection is prevalent.

The Rise and Fall of Petromin

The underlying tensions noted earlier, between the Saudi government and the SOCAL foreign partners over concession agreement sharing and royalty and tax payments prompted the government take a decision to set up a wholly owned Saudi institution to manage its upstream oil assets and replace foreign-created Aramco. The first steps were taken by Crown Prince Faisal bin Abdul-Aziz when he took over state powers from his brother King Saud, and Abdullah Tariki, the Saudi Minister of Petroleum and Minerals, was replaced by Zaki Yamani. In 1962, a Royal Decree established Petromin, and Abdelhadi Taher, who started his career in the Directorate General of Petroleum and Minerals Affairs headed by Abdullah Tariki and then obtained his Ph.D. from the University of Berkeley in California, was made its Governor.

Petromin's mandate was extensive in that it would be responsible for exploration, refining, and distribution of all petroleum and mineral resources in Saudi Arabia that were not the domain of the then US-controlled oil concessionaire Aramco, and in line with Tariki's nationalist vision, its future role as an NOC – national oil company – was envisaged (Hertog 2008). The objective seemed clear: Petromin was supposed to become a governmental equivalent of Aramco, and one day takes its place. To put this in perspective, the period was a heyday of resource nationalism with oil producers from Indonesia, Venezuela, to Algeria creating national oil companies.

Dr. Taher assumed his new role with enthusiasm and interpreted Petromin's mandate broadly, and the organization became the main vehicle of Saudi industrialization efforts for the coming decade since 1962. Petromin's activities included mineral projects, oil and gas exploration in areas relinquished by Aramco, and distribution of gas and refined products within the Kingdom, as well as starting its own oil shipping operations. However, while the intention on paper seemed laudable, as will be noted below, the final results did not materialize as planned, with Petromin being wound down by the late King Abdullah in 2005. In a brief press statement, it said that "the Council of Ministers yesterday abrogated the General Organization of Petroleum and Minerals (Petromin) and merged its properties with Saudi Aramco" (Abdul Ghaffour 2005).

To understand the rise and fall of Petromin, one needs to understand that institutions like NOCs are closely tied with the political powerbase of their mentors that leads to their prominence and dominance in some periods but declines in other periods when this political power base changes. In the case of Petromin, the main driving force was King Faisal and his protégé Zaki Yamani, who then groomed a new Saudi generation of management to run this ambitious venture, in parallel with an existing oil company Aramco, albeit, that was foreign managed. It would only be a matter of time before it became clear on whether Petromin would overshadow Aramco and take it over or for Petromin to be acquired by Aramco and close the era of setting up a wholly owned NOC without international partners or foreign management. The results are known and the rest is history as they say, but it is important to analyze how and why Petromin could not achieve its wide mandate and what

lessons Aramco learned from Petromin's failure to ensure that it minimizes this occurring to the company today.

As noted, Petromin, under the ambitious Dr. Taher, initiated a raft of heavy industry ventures in recognition that in the boom days of the 1970s, local merchants and contractors were not capable to undertake large-scale industrialization projects by themselves. With this in mind, Petromin started petrochemical projects, oil refineries in Saudi Arabia and abroad, glass and steel plants as well as power generation projects, with Petromin acquiring majority shareholding in projects with foreign partners. The fast expansion in multi-projects by Petromin led to rapid Saudi employment, often based on cronyism. The organization's overall development reflected a general pattern of politicized recruitment in common with the majority of NOCs in the developing resource economies of the time. Despite some grandiose promises and plans, many of Petromin's ventures tended to either get delayed, go nowhere, or end in disputes (Hertog 2008). While having a mandate for mineral explorations, such exploration activities were either disappointing or never took off, and joint ventures also faced the same fate like a petrochemicals joint venture with Phillips and Hercules, while SAFCO (Saudi Fertilizer Company), a venture with Occidental of the USA, ended up in arbitration in the International Chamber of Commerce (Hertog 2008).

Petromin's industrialization drive, especially in the nascent petrochemical sector, took off in the 1970s with multi-billion dollar negotiations taking place with Mitsubishi, Shell, Dow, and Mobil and large steel mills planned with BHP and Marcona and plans for a trans-Arabian oil pipeline to a new industrial complex at the Red Sea Port of *Yanbu* with Mobil. Marketing of Aramco's oil was also an important element of Petromin's mandate, and it created *SAMAREC* (Saudi Arabian Marketing and Refining Company) in 1988, the year when Aramco had become a fully owned national oil company. However, in July 1993, 2 years before Petromin's final demise, King Fahd issued a Royal Decree, when Crown Prince Abdullah was the country's regent and effective ruler, merging the operation and facilities of *SAMAREC* into Saudi Aramco (Ghazal 2011).

The merger transferred a series of assets and responsibilities to Saudi Aramco, among these were the three domestic refineries (the 190,000 bpd *Yanbu* refinery, 140,000 bpd *Riyadh* refinery, and Petromin's 75% stake in *Jeddah*'s 90,000 bpd refinery). Saudi Aramco also assumed Petromin's 50% stake in its three joint-venture export refineries – the 320,000 bpd refinery with Mobil in *Yanbu*, the 300,000 bpd refinery with Shell oil in *Jubail*, and with Greece's Petrola in *Rabigh*. As a result of the merger, Saudi Aramco assumed responsibility for operating eight terminals on the Red Sea for shipping and receiving crude oil, NGL, and other refined products. The company also took over operation of the Kingdom's petroleum product distribution network, which included 18 bulk storage plants and 14 air-fueling units at airports. All of the above led Saudi Aramco to assume responsibility for operating the Kingdom's domestic oil refineries and joint-venture facilities, and by the "stroke of his pen, King Fahd had transformed Saudi Aramco into the world's third-largest refiner after Exxon and Royal Dutch Shell" (Saudi Aramco 2011b, Volume 2, pp. 108, 109). It fell upon Khalid Al Falih, along with ten other

Aramco colleagues, to execute the integration of SAMAREC in Kingdom facilities and its employees into Saudi Aramco, in what he described as a “seamless organization,” and provided the Saudi Aramco management team with invaluable experience to complete the take-over of Petromin in 2005.

The death of King Faisal in 1975 and the assuming of power by King Fahd set in motion the eventual demise of Petromin and those associated with it, especially Oil Minister Zaki Yamani. In essence however, Crown Prince Abdullah had assumed the Regency role governing the Kingdom during King Fahd’s illness from 1996 to 2005 when Abdullah became King. A new group of technocrats close to King Fahd, and also to King Abdullah, emerged, among them being Hisham Nazer and Ghazi Al Gosaibi. In 1975 Hisham Nazer was appointed as the Kingdom’s Minister of Planning and Ghazi Al Gosaibi as the Minister of Industry and Electricity to implement the massive industrialization drive that King Fahd and later King Abdullah were keen to pursue. As the quote at the beginning of the chapter states, sometimes events of great consequences often spring from trifle circumstances, and while ministerial appointments are not trifling circumstances, these two appointments certainly led to great consequences as far as Petromin’s future was involved and made Aramco what Petromin was originally meant to become: the sole actor in the Saudi oil sector.

Following an in-depth review in 1975 by the higher committee for administrative reform, headed by King Fahd’s full brother, Prince Sultan bin Abdul-Aziz, it was decided to carve out Petromin’s industrial empire, with refining staying with Petromin, whereas petrochemicals and mining were assigned to Dr. Gosaibi’s new Ministry of Industry and Electricity. As noted earlier, when Petromin’s remaining refining segment was transferred to Saudi Aramco in 1993, the final days of Petromin were clear for all to use.

Dr. Ghazi Al Gosaibi did not waste time and set out to review all Petromin’s industrial objectives to assess their viability, either to retain them or to discard projects. In 1976, in a decision that was indeed to have an impact of future great consequence, Dr. Gosaibi established the *Saudi Arabian Basic Industries (SABIC)* with the Minister appointed as Chairman and Abdul-Aziz Al Zamil, as its first CEO, with SABIC taking over the operational responsibility for petrochemicals and other heavy industry projects. Unlike Petromin, the new company SABIC was set up with a lean managerial structure and incorporated as a company which eventually sold 30% of its capital to Saudi nationals, starting the era of successful domestic IPO flotation, with a similar intention in mind for the planned Aramco IPO to float at least half of its shares in the local Saudi stock market.

Petromin’s demise was also hastened by reports of corruption and commission payments to the company’s top officials. In 1979, it is reported that the Italian state oil company *Eni* agreed to pay \$115 million commission for an oil supply contract, with half paid to Italian politicians and the rest to Saudi officials. Other exposes of irregular payments were reported such as one involving the West German company AVIA and lavish gifts from John Latsis who was the part owner of the Petrola refinery in *Rabigh* (Hertog 2008). Aramco has also faced some cases of corrupt practices, such as the *Tyco* contractor payment affair and the *Embraer* aircraft deal, as

well as an earlier 1977/1978 scandal on a gas gathering project that was originally conceived by Petromin. These came to be seen as exceptions and were quickly dealt with by Aramco, by either sanctioning the concerned Aramco officials or by initiating company internal audit led investigations. The approach taken by Aramco was due to the difference between the two organizations, whereby Saudi Aramco has been widely insulated from local politics and had kept its international management and independent board advisors even after full Saudi ownership, while Petromin by comparison was caught in the middle of local political infighting and interest groups.

The beginning of the end for those championing Petromin as the alternative to Aramco started in 1987 when both Zaki Yamani and Dr. Abdehadi Taher were removed from the Aramco board, and in November 1988, Hisham Nazer was named as Aramco's first Saudi Chairman. The effective power shift in favor of Aramco, however, was the appointment of Hisham Nazer as Oil Minister in 1986, with the abrupt dismissal of Zaki Yamani who heard of his removal on public television.

With the appointment of Ali Al Naimi, a quintessential *Aramcon* technocrat who had spent all his working life with the company as Oil Minister in 1995, the full control of Aramco's destiny was now in the hands of those who had jealously guarded their unique management oversight of the national oil company, and this continues to this day with the later appointments of Aramco insiders like Khaled Al Falih and Amin Nasser. Under Crown Prince Abdullah's Regency, the effective dissolution of Petromin accelerated and Oil Minister Naimi continued the mopping up of Petromin's remaining operations. In 1996 Saudi Aramco took full control of *Lubref* and *Petrolube*, Petromin's lubricating and base oil companies, while the mining assets were converted into the new national mining company *MAA'DEN* in 1997 with Naimi as Chairman of the Board (Maaden 2016). The synergy between Aramco and the Saudi mining sector continues today with the appointment of Khaled Al Falih as Minister of Energy, Industry and Mineral Resources in 2015. One can but only speculate at how things might have turned out if Petromin had succeeded and took over Aramco and what the current state of the Saudi energy sector and economy would be like.

The ministerial changes that King Salman made in 2016 and 2017 on the recommendations of Crown Prince Mohammed bin Salman are just as important as those that were made by both King Fahd and Abdullah which set in motion the dissolution of one state enterprise and empowered another. The latest government reforms and changes will shape the future direction of Saudi Aramco and its role at the heart of the Vision 2030 economic transformation. The good intentions were also the same for Petromin, but this time lessons have been learned to ensure that Aramco's expanded mandate is managed in a way that should not deviate the company in a significant manner from its core strengths.

Aramco in the Limelight: Rising to the New Challenges

The Petromin era has highlighted several important issues that are pertinent to Saudi Aramco today. The first is that one of the main reasons for Petromin's failure was its ambitious over reach in getting involved in multitasks that went beyond its mandate,

albeit that this was expanded without clear strategic thought to suit power political grabs by ambitious technocrats. Saudi Aramco, as will be noted in later chapters, is a focused and well-managed energy company but whose mandate is also being expanded by the government to act as a national “master contractor” in mega development projects and multi-CSR activities, all of which will extend the company’s management capacity and possible tight internal control. Second, while Saudi Aramco remains a unique institution thanks to King Fahd, and especially King Abdullah, to effectively shield it from the rest of the Saudi state and allow for its unique Saudi and foreign management structure to operate, yet in the final analysis the company operates under a majority government control structure. King Fahd set up supreme council for the company, chaired by him, which approves Saudi Aramco’s 5-year plans and annual reports as well as appointing the company’s President at the recommendation of the Board of Directors. In 2017, the company’s supreme council was headed by Crown Prince Mohammed bin Salman, with the supreme council having the same mandate.

By itself, this is a sign of continuity in Saudi government oversight of the company, but given the planned IPO, some questions are being raised on how much freedom will Saudi Aramco be granted in meeting conflicting investor interests post an IPO, as the government will retain around 95% of the company, with state ownership passing to the Public Investment Fund (PIF). These issues will be dealt with in depth in later chapters, but the lessons learned from Petromin is that any new ownership and government oversight must be apolitical to avoid the same mistakes occurring as in Petromin, whereby narrow interest groups and powerful personality rivalries can eventually wear down an institution.

As this book will explore, Saudi Aramco has a long history of internal independence, supported by middle and senior management that are the product of a unique *Aramcon* hiring, grooming, and career progressing program, which has turned out professional and world-class managers who possess many different skills and functions. This has created a rich pool of interchangeable talent, something that was sadly lacking in Petromin, where senior managers jealously guarded their turf and were suspicious of bright subordinates, as this was perceived to diminish their political loyalty base.

With these inherent strengths, in essence the core *DNA* of the company, Saudi Aramco stands today on the threshold of a new and fundamental transformation comparable to the epoch making changes that took place in those heady early days of the concession. As noted, only belief and sheer determination by a few courageous men launched the company to where it is today.

Chapter 2

Not Your Average National Oil Company

If you wish to reach the highest, begin at the lowest

Syrus-maxims

Ensuring Long-Term Survival: Aramco's Upstream Might

Aramco today produces approximately one in every eight barrels of the world's crude oil supply, and the company is of the firm belief that as the global population grows, economies, especially of some of the major developing countries like China and India, grow; standards of living increase; and energy will continue to be an essential opportunity for Aramco. At the same time, the company is aware of global concerns arising from fossil fuel emission and global warming and the trend for use of renewable energy. The company today rests somewhat secure based on Aramco's undisputed low cost base and its upstream oil might, despite some dispute over the size of the Kingdom's oil reserves discussed in later chapters. Saudi Aramco is also moving ahead and is taking steps to capture and create value from the hydrocarbon it produces.

To this end, the downstream refining of petrochemical sector opens up opportunities for organic growth and domestic and international partnerships with leading firms to create business for Saudi service and material suppliers in local supply chains and generate new jobs which are important objectives of the Vision 2030 plan. The company's strategic intent is clearly set out, whereby by 2020, Saudi Aramco will become the world's leading integrated energy and chemical company, focused on maximizing income and facilitating the sustainable and diversified expansion of the Kingdom's economy (Saudi Aramco 2016b, Annual Review 2015). To achieve this, Saudi Aramco will have to expand its "footprint" in new locations overseas and expand its research capabilities and alliances. As will be noted in later chapters, Saudi Aramco has been a critical agent for the social and economic development of the Kingdom, with the government drawing upon the company's unrivalled management skills to carry out projects which are not part of its core business activities, and the list of new projects, sectors, and tasks it has assumed has grown rapidly. Despite this "distraction" from its core business, the company has continued to build both its upstream capacity in order to maintain this at around the 15 million barrels per day, the largest in the world, while at the same time expanding into petrochemicals, with the aim to be among the top three petrochemical companies worldwide.

In order to support its global refinery and petrochemical projects, Aramco has invested in significant upstream field maintenance and new field expansion programs, both onshore and offshore in oil and gas, the latter being a critical feedstock for its petrochemical projects. This has ensured that Saudi Aramco's production levels are maintained on a sustainable basis as noted in Table 2.1.

Table 2.1 Saudi Aramco oil and gas production 2011–2016

Section	2011	2012	2013	2014	2015	2016
<i>(A) Oil</i>						
• Total crude production (million barrels)	3310	3479	3433	3480	3708	3828
• Average crude oil production (million bpd)	9.1	9.5	9.4	9.5	10.2	10.5
<i>(B) Gas</i>						
• Raw gas processed (billion scfd)	9.9	10.7	11.0	11.3	11.6	12.0
• Sales gas production (billion scfd)	6.8	7.3	7.5	7.8	8.0	8.2
• Ethane production (million scfd)	792	851	796	809	794	920
• NGL from hydrocarbons (million barrels)	461	482	456	471	474	497.5

Source: Saudi Aramco Sukuk Company 37.5 billion, Sukuk Issuance Program, Base Prospectus, 2017c, pp. 33, 34, Saudi Aramco 2017e (Annual Review, 2016), pp. 74, 75

Saudi gas production has been consistently expanding, as the Saudi economic base has become more diversified and domestic power and manufacturing plants expanded. In Saudi Aramco's overall gas operations, natural gas is processed to produce "clean fuel" (methane or sales gas) and "feedstock" (methane, ethane, propane, butane, and natural gas). The methane and ethane are currently consumed entirely by Saudi Arabia's utilities and industry, and excess propane, butane, and natural gas that are not used by the domestic petrochemical industry are exported. According to the company, Saudi Aramco's natural gas production is currently sufficient to meet the Kingdom's domestic consumption requirements. Unlike Dubai, which imports substantial gas to meet its needs from Qatar, the dispute between Qatar and other members of the GCC bloc did not affect Saudi Arabia's gas requirements. Saudi Aramco's principal domestic gas facilities are the following:

Fadhili: This is in its early phase and, when completed, will become a key component of the Kingdom's master gas system.

Midyan: This delivers sales gas and condensate to power the Saudi electricity company's new Duba Power Plant.

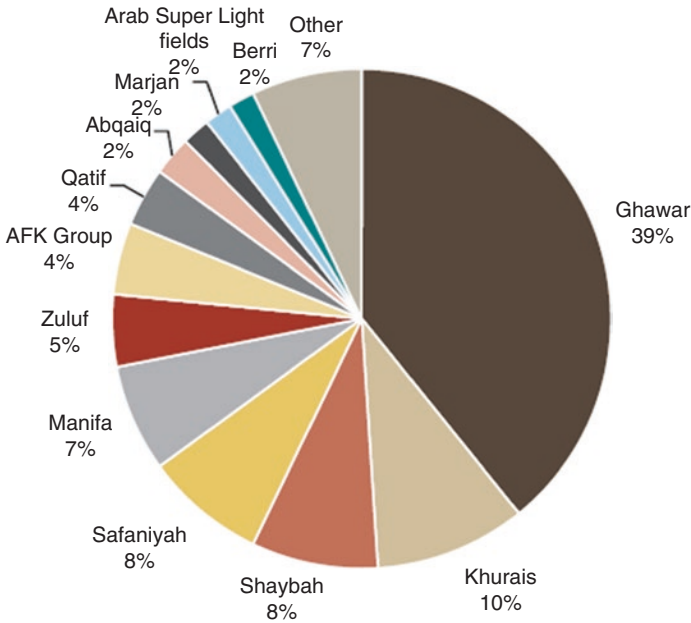
Shaybah: Production started in December 2015 and reached processing capacity of 2.4 billion scfd of associated gas during 2016.

Wasit: The plant is designed to process 2.5 billion scfd of nonassociated gas and supply 1.7 billion scfd of sales gas to the master gas system, fueling Saudi Arabia's electrical power and seawater desalination plants and supplying feedstock for Saudi Arabia's petrochemical industry (Saudi Aramco, Sukuk Prospectus, 2017c, p. 34).

Concerning oil production, Saudi Aramco produces five grades of crude oil: *Arabian super light*, *Arabian extra light*, *Arabian light*, *Arabian medium*, and *Arabian heavy*. These types of crude oil grades meet the need of different refineries as well as overseas customers and provide the Kingdom with a more diversified marketing opportunity, as the international oil market is not a homogeneous one but subsegments with different price differentials. Saudi Aramco's principal oil production sites are as follows:

- *Abqaiq:* this is Aramco's largest oil processing facility and receives sour crude oil from gas separation plants, processing it into sweet crude and transports it to Saudi Aramco's refining facilities at *Ras Tanura* and *Jubail*, as well as to *Yanbu* and to the BAPCO refinery in Bahrain.
- *Haradh:* this is situated on the southern tip of the *Ghawar* field with 300,000 bpd of Arabian light crude oil capacity and *Haradh III* added 1.40 million scfd of associated gas processing capacity in 2016.
- *Khurais:* this has a capacity of 1.2 million bpd of Arabian light crude and gas facilities treating associated gas to produce up to 70,000 bpd of condensate and 320 million scfd of gas.
- *Khursaniyah:* includes facilities to process and stabilize up to 500,000 bpd of Arabian light crude and a gas plant to process 1 billion scfd of associated gas.
- *Manifa:* commencing operation in 2013, this has a capacity of up to 900,000 bpd of Arabian heavy crude oil and 90 million scfd of sour gas and 65,000 bpd of hydrocarbon condensate.
- *Nuyyim:* has a capacity to produce up to 100,000 bpd of Arabian super light crude oil and 90 million scfd of gas.
- *Qatif:* can produce and process up to 500,000 bpd of blended Arabian light crude oil and 300,000 bpd of Arabian medium crude oil from the offshore *Abu Sa'fah* field.
- *Shaybah:* completed in 2009, the oil production capacity increased to 750,000 bpd and expanded its gas compression, water injection, and power generation facilities (Saudi Aramco, Sukuk Prospectus, 2017c, pp. 33, 34).

Figure 2.1 sets out the liquid production contribution of Saudi Arabia's main fields. The dominance of the supergiant *Ghawar* oil field, with 39% of total Saudi production, illustrates the critical importance of this field in sustaining Saudi oil production.

Fig. 2.1 Saudi Aramco liquid production by field

Source: UBS, Global Research, July 2017, p. 2

Adding Value: The Emerging Refinery Empire

The expansion of Aramco's downstream activities has several objectives, namely, increasing the company's global presence and creating sustainable economic competitive advantages in the face of erratic oil prices. The aim is to diversify the company's risk and take advantage of a crude oil placement strategy that provides an optimal balance of geographic exposure between Asia, Europe, and North America where Aramco already has a presence, as well as adding new ones as explained later in the chapter. According to the company's CEO, Aramco's goal is to increase refinery capacity from current levels of around five million barrels per day to closer eight to ten million barrels per day and that chemicals will become a more important part of the business mix of Aramco over time. Based on its direct ownership, Aramco is the world's fourth largest refiner, behind Exxon Mobil Corp., Royal Dutch Shell PLC, and China Petroleum and Chemical Corp. or of Sinopec. According to Aramco CEO Amin Nasser, if the ten million refining capacity is reached by 2025, this would place the company at the top of the global ranking, and Aramco would be able to produce enough refined products to supply near now all the gasoline, diesel, and other fuels that China consumes (Blas and Mahdi 2016).

Saudi Aramco's downstream activities include refining, manufacturing, marketing, transporting, and supplying of crude oil, petroleum, petrochemicals, and products and related services to wholesale and retail customers. Saudi Aramco's refining operations include four domestic refineries that are wholly owned and operated by the company located in *Ras Tanura, Yanbu, Riyadh, and Jeddah*. A fifth domestic refinery, the *Jazan* Refinery and Terminal, is currently under construction in *Jazan* and, once completed, will have the capacity to process 400,000 bpd of crude oil. The *Ras Tanura* refinery is among the largest refineries in the region with a production capacity of 550,000 bpd. Besides the domestic operations, Saudi Aramco holds direct and indirect equity interests in five domestic joint ventures and four international refining operations. Tables 2.2 and 2.3 set out these domestic and international refineries as well as the principal products manufactured at in-Kingdom refineries.

Table 2.2 Saudi Aramco refining domestic and international capacity

Facility	Year of establishment	Total capacity (000' bpd)	Saudi Aramco or affiliate ownership	Saudi Aramco share of capacity (000' bpd)
(a) Domestic				
Ras Tanura	1945	550	100%	550
Riyadh	1974	126	100%	126
Jeddah	1968	78	100%	78
Yanbu	1983	245	100%	245
Petro Rabigh	2009	400	37.5%	150
SAMREF – Yanbu'	1984	400	50%	200
YASREF – Yanbu'	2014	400	62.5%	250
SASREF – Jubail	1985	300	50%	150
SATORP – Jubail	2013	400	62.5%	250
Total domestic		2899		1999
(b) International				
Motiva – USA ^a	1903	1070	50%	535
S-Oil – South Korea	1980	669	63.4%	424
Showa Shell – Japan	1955	445	14.96%	66.65
PREP – China	2009	280	25%	70
Total		5363		3094.65

Source: Saudi Aramco Facts and Figure, 2016c, p. 28

^aNote: Motiva became 100% Saudi ownership in March 2017

Table 2.3 Principal products manufactured at in-Kingdom refineries 2016 (millions of barrels) by total and Saudi Aramco's share

2016	LPG	Naphtha	Gasoline	Jet fuel/kerosene	Diesel	Fuel oil	Asphalt and misc.	Total
Ras Tanura	4.743	17.578	46.112	11.858	65.893	31.260	5.344	182.788
Yanbu ^a	3.601	3.368	11.018	(0.521)	35.154	36.955	–	89.575
Riyadh	2.462	–	12.569	4.904	21.054	(0.047)	7.375	48.317
Jiddah	0.804	2.362	4.063	0.159	2.397	6.837	5.527	22.149
Total in Kingdom	11.610	23.308	73.762	16.400	124.498	75.005	18.246	342.829
Saudi Aramco share (millions of barrels)								
2016	LPG	Naphtha	Gasoline	Jet fuel/kerosene	Diesel	Fuel oil	Asphalt and misc.	Total
SAMREF ^a	(0.671)	–	24.079	10.481	19.814	14.384	–	68.087
SASREF	1.387	11.787	2.219	10.983	16.580	12.339	–	55.295
Petro Rabigh	0.810	8.482	5.357	5.016	10.829	13.919	–	44.413
SATORP	0.254	3.919	16.627	10.496	45.997	1.716	–	79.009
YASREF	–	–	21.942	–	53.038	–	–	74.980
Total share (Aramco)	1.780	24.188	70.224	36.976	146.258	42.358	–	321.784
Grand total	13.390	47.496	143.986	53.376	270.756	117.363	18.246	664.613

Source: Saudi Aramco 2017e, 2016 Annual Report, p. 77

^aNegative figures primarily indicate products that were reprocessed into other refined products

The age of the domestic refineries varies, as illustrated in Table 2.2, with the oldest and biggest *Ras Tanura* established in 1945 and the newest *Yanbu* refinery established in 1983. As will be noted in later chapters, this complicates the issue of how to value refineries of different ages for the planned Aramco IPO, and this issue is also somewhat complicated given the varying degree of Aramco's shareholding in the domestic and international refineries, ranging from around 15% in the Showa Shell Japan refinery to around 64% in S-Oil South Korea.

Analysis of Table 2.3 indicates that the primary in-Kingdom manufactured refined products are diesel, fuel oil, and gasoline destined for the domestic market at subsidized rates, again raising valuation issues for the Aramco IPO. As such, it is important to examine more closely the various domestic and international Aramco joint venture refineries, given that the final Aramco IPO is still not very clear whether the company's upstream, i.e., oil production or a combination of upstream and downstream, refinery assets will be carried out.

Domestic Refineries

- *SAMAREF*: A 50/50% joint venture between Saudi Aramco and Mobil *Yanbu* Refining Company, a wholly owned subsidiary of Exxon Mobil Corporation, with a design capacity of 400,000 bpd, located in *Yanbu*.
- *SASREF*: A 50/50% joint venture between Saudi Aramco and Shell International, located in *Jubail* Industrial City in the eastern region. It has a design capacity of around 300,000 bpd, and in addition to its oil refining operation, the plant produces propylene, paraxylene, and coke.
- *Petro Rabigh*: The *Rabigh* Refining and Petrochemical Company is a publicly listed company on the Saudi stock exchange since 2008 and both Aramco and Sumitomo Chemical holding 37.5% each. The facility is located in *Rabigh* on the Red Sea coast with a capacity of 400,000 bpd of crude oil, 95 million cubic feet per day of ethane, and 15,000 bpd of butane as primary feedstock to produce a variety of refined petroleum products and petrochemical products.
- *SATORP*: The Saudi Aramco Total Refining and Petrochemical Company is a Saudi Aramco and Total (62.5–37.5%) joint venture, with a design capacity of around 400,000 bpd located in *Jubail* Industrial City on the East Coast.
- *YASREF*: The *Yanbu* Aramco Sinopec Refining Company is a joint venture between Saudi Aramco and Sinopec (62.5–37.5%), located in *Yanbu* on the West Coast and with a capacity of 400,000 bpd designed to process Arabian heavy crude oil from the *Manifa* field.

In addition to the above operational joint venture facilities, another is *SADARA* or the Sadara Chemical Company, is a joint venture between Aramco and the Dow Chemical Company (65–35%), which is Aramco's latest and most advanced petrochemical refinery "crown jewel." It is a \$20 billion project and expected to be the world's *largest* integrated chemical complex in a single phase, with production

capacity to produce up to 7.9 million metric tons of olefins, polyolefin, and a range of diversified specialty chemicals and plastics per year, and the first chemical complex in the GCC region to crack naphtha. In August 2017, Dow and Aramco signed an MOU to allow Dow to acquire an additional 15% ownership in the joint venture to take their partnership stake to 50:50 level (Argaam 2017m).

International Refineries

- *Motiva*: This is a Houston, USA, headquartered refining, distribution, and marketing joint venture with Shell Oil Company on a 50/50% basis until May 2017 when Saudi Aramco acquired Shell's equity for \$2.2 billion and \$3.1 billion out of outstanding \$3.2 billion net debt (Goldsmith 2017). Under the splitting of the joint venture agreement, Aramco took over the 26 distribution terminals and exclusive license to use the Shell brand for gasoline and diesel sales in Texas and the 603,000 bpd Port Arthur, Texas, refinery, the largest in the USA. In a further sign of its long-term commitment to its US operation, Aramco announced plans to invest up to \$30 billion in Motiva by 2023, with \$12 billion the initial investment in a project to expand refining capacity at the Port Arthur refinery and an additional investment of \$18 billion by 2023 (Seba 2017).
- *S-Oil*: The company is a South Korean oil refining and marketing company and Saudi Aramco holds a 63.4% stake. S-Oil owns and operates the *Onsain* refinery in *Ulsan* with a capacity of 669,000 bpd, as well as other facilities producing petrochemicals and lube base oil.
- *Showa Shell Sekiyu*: Aramco holds a 14.96% stake in the Japanese Corporation, which is one of the largest in Japan, owning three oil refineries with a combined capacity of 445,000 bpd, with Aramco supplying Arabian crude oil to all three facilities.
- *FREP*: The *Fujian* Refining and Petrochemical Company is a Chinese joint venture between Aramco (25%), Exxon Mobil China Petrochemical Co. Ltd. (25%), and *Fujian* Petrochemical Company (50%). The company owns and operates an integrated refinery designed to process light Arabian crude oil with a capacity of 280,000 bpd.

Besides the above refineries, Saudi Aramco is also a shareholder in Sinopec *Sen Mei* Petroleum Company Ltd. (SSPC), holding 22.5%, Exxon Mobil China Petrochemical Ltd. (22.5%), and Sinopec (55%). SSPC is a marketing joint venture and is the largest processed oil supplier in *Fujian* Province.

The result from all these domestic and international refineries is that while Saudi Aramco has maintained its crude oil exports, the company has also managed to increase its market share in refined products as illustrated in Table 2.4.

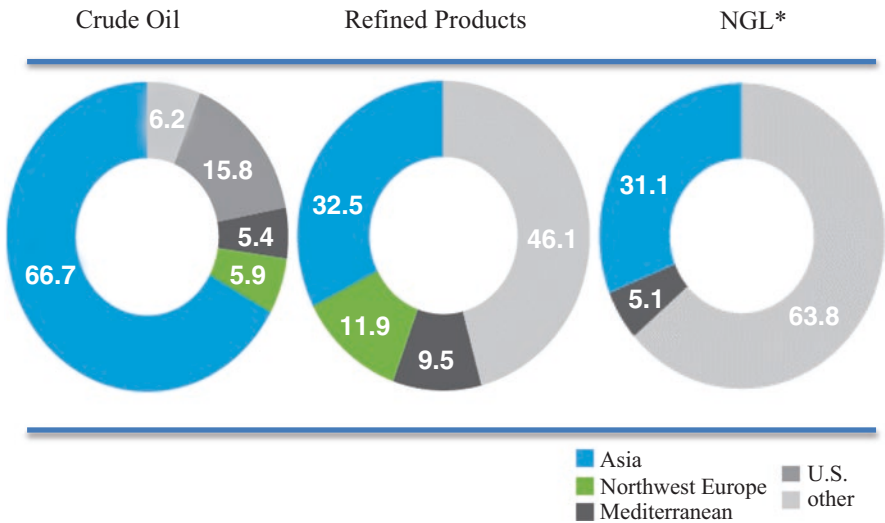
Table 2.4 Saudi Aramco crude and refined products exports by geographic regions (2011–2015) in million barrels

Destination:	2015		2014		2013		2012		2011	
	Crude oil	Refined products	Crude oil	Refined products	Crude oil	Refined products	Crude oil	Refined products	Crude oil	Refined products
Asia and Far East	1669.6	211.3	1610.0	200.3	1670.8	182.5	1669.6	178.5	1633.2	180.3
North America	434.6	–	456.7	4.7	532.5	–	521.0	0.6	479.3	1.7
Europe	320.2	66.0	347.5	41.1	347.4	27.9	362.6	40.6	324.8	42.7
Middle East	104.5	71.5	99.8	67.9	99.4	43.0	102.7	55.4	103.8	58.5
Africa	53.7	71.3	69.7	41.7	81.0	33.4	79.1	34.9	61.8	35.7
South America	25.4	1.5	25.1	4.8	29.1	3.0	25.0	4.5	27.3	9.4
Oceania	6.5	–	2.1	–	3.2	–	5.8	1.1	4.4	1.0
Total	2614.5	421.5	2611.0	360.6	2763.3	289.8	2765.8	315.5	2634.6	329.3

Source: Kingdom of Saudi Arabia Global Medium Term Note Program, Kingdom of Saudi Arabia 2016, p. 111

What Table 2.4 highlights is that the majority of Saudi Arabia’s exports of crude oil and refined products is to countries in Asia and the Far East, with sales to North America becoming negligible as far as refined products are concerned in face of a surging domestic US refined product output due to the US shale sector, as will be addressed later. Figure 2.2 illustrates the dominance of the Far East to Saudi Arabia’s crude oil and refined products, as well as NGL or natural gas liquid exports.

Fig. 2.2 Saudi crude oil and refined products exports by region (%) for 2016



Note: * Includes sales on behalf of SAMREF and SASREF
 Source: Saudi Aramco, Annual Review 2016 (2017e, pp. 78)

Crude or Refined Product Exporter? Economic Diversification and Vulnerabilities

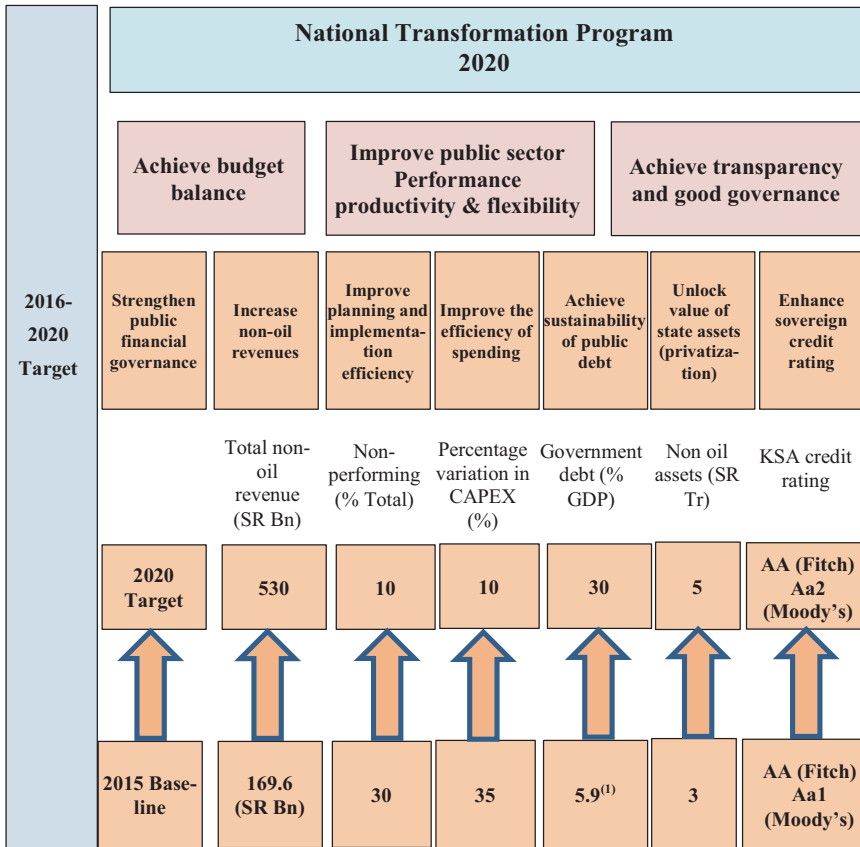
Saudi Aramco is at a threshold in terms of its own future business model – should the company remain pure oil and gas company or a conglomerate and expand its role in petrochemicals and refined products as well as other noncore sectors – to be addressed in a later chapter? From the available evidence noted earlier, Saudi Aramco seems determined to explore and evaluate opportunities, whether grass root at home or abroad to grow its refining and chemical portfolio, particularly in China and the ASEAN region, a geographic area where Saudi Armco sees sustained

growth. Saudi Arabia is already a major crude oil supplier to six major Asian countries – China, Japan, South Korea, Taiwan, the Philippines, and India – but Saudi Aramco’s objective is to deepen this trading relationship through participating in integrating refining, chemicals, marketing, and distribution companies in China, Japan, and South Korea. To carry this out, Saudi Aramco has established offices globally in Europe (The Hague, London, Milan, Paris, Delft, Aberdeen), North America (Houston), and Asia (Beijing, Shanghai, Tokyo, Seoul, and Singapore). An additional Asia office has been opened in New Delhi, India, with Aramco Asia in Beijing, China, overseeing the Asian regional strategy.

To complement Saudi Aramco’s marketing presence, the company has also entered into direct commodity trading for its petroleum products and established *Saudi Aramco Products Trading Company (ATC)*, which has traded an average of more than 1.1 million bpd of refined petroleum products and 3700 tons per day of chemical products. Aramco’s ATC is currently headed by Mr. Ibrahim Al Buainain, who took over from its first CEO Mr. Said Al Hadrami, a veteran of the company, where he helped ATC expand its presence and operations by entering new markets, increasing third-party trades, and reaching out directly to end users for product sales and purchases, without having to go through brokers. This type of independent experience by Aramco’s trading arm should assist the company as it seeks to establish a new commercial-oriented corporate culture post its planned IPO, where “bottom-line” profit-and-loss accounting and management accountability will become more prevalent, as opposed to a “cost center” approach. In 2017, Aramco announced plans to buy non-Saudi crude and refined third party products under the expanded mandate of the ATC which is hoped to lead to bottom line profitability and place Aramco on par with International Oil Companies (Dipaola 2017).

While the Kingdom will still play a major role in crude oil production and sale for many years to come, the newly appointed Saudi Crown Prince Mohammed bin Salman has acknowledged that Saudi Arabia can no longer grow based on oil revenue alone and meet public spending in the face of a changing global energy market and a demographic transition that will inevitably lead to a bulge in the number of working age Saudis by 2030. A productivity-led transformation of the economy is deemed essential, as will be discussed in the next chapter, but one of the core sectors that has been identified is a petrochemical non-oil growth opportunity. This target has been set to reach at SR 530 billion in non-oil revenue by 2020 under the National Transformation Plan (NTP) 2020, along with other key NTP objectives set out in Fig. 2.3.

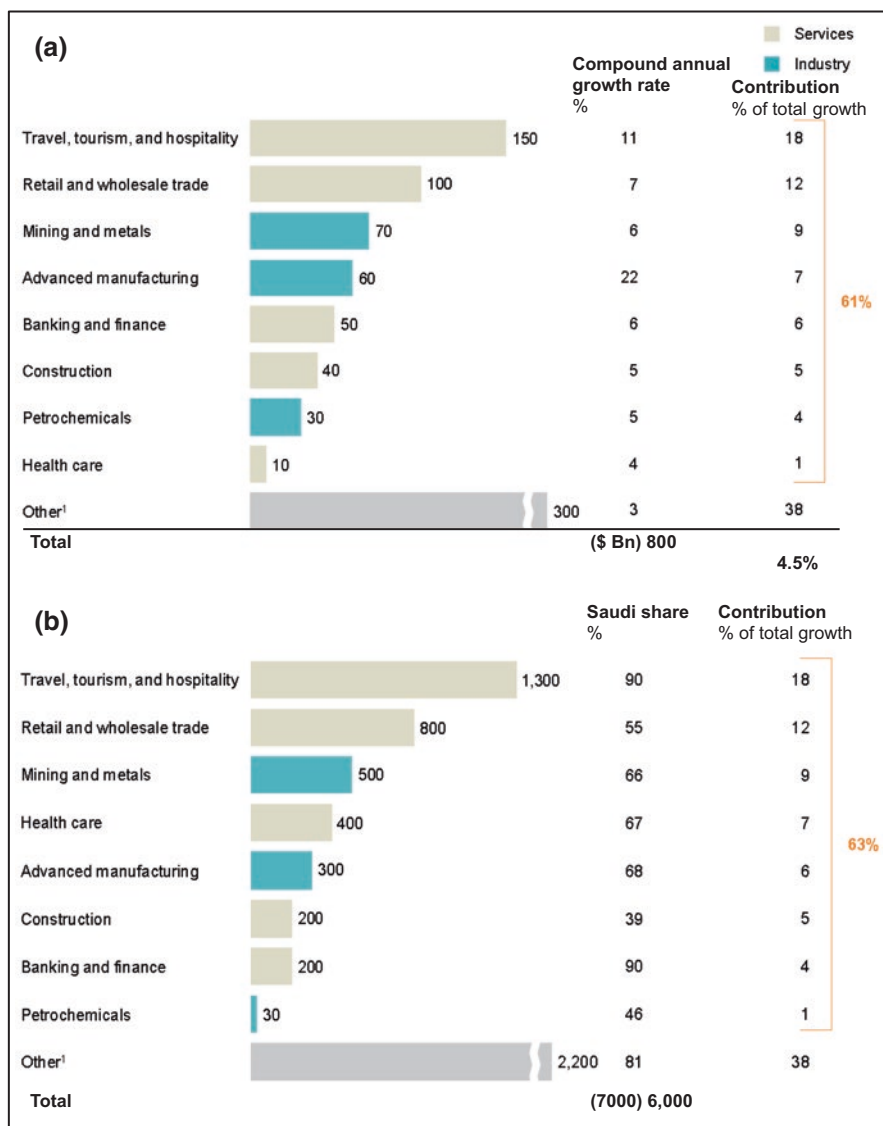
Fig. 2.3 National Transformation Plan 2020: key objectives



Source: Adapted from: Saudi Arabian Government (2016a). Vision 2030 official website: www.vision2030.gov.sa

According to some estimates, eight sectors could potentially account for more than 60% of GDP and job growth to 2030 illustrated in Fig. 2.4.

Fig. 2.4 Saudi economic transformations to 2030: eight sectors could potentially account for more than 60% of GDP and job growth to 2030. **(a)** Potential change in Saudi employment, 2014–2030 (Saudi nationals, thousand). **(b)** Potential change in Saudi employment, 2014–2030 (Saudi nationals, thousand)



Note: * Includes agriculture, other manufacturing, communications, utilities, personal services, business services, and real estate

Source: McKinsey Global Institute, December 2015, p. 46

According to Fig. 2.4, the main driver for growth in the Saudi GDP and potential change in Saudi employment generation will be in the travel and tourism, as well as in the retail and wholesale sectors. Petrochemicals are estimated to contribute around \$30 billion by 2030 and add another 30,000 new Saudi jobs. However it should be noted that while the other sectors might generate more Saudi jobs, the petrochemical sector will add highly paid and value added jobs, and the spin-off from petrochemicals will be felt in both the direct and indirect growth of advanced manufacturing, mining, and metals sectors, which underestimates the overall economy-wide potential from the petrochemical sector.

Petrochemicals: The New Frontier

The expansion of Saudi Aramco's downstream integration in vertically integrated projects through its own or joint venture refineries and marketing outlets will ensure its ability to compete at the retail level and resist undesirable oil price changes. At the same time, more direct control of its petrochemical and refinery outlets will enhance Aramco's security of demand and security of supply, as Aramco will always supply its own refineries as a priority. In the long term, this is a more viable commercial strategy than having agreements to supply crude oil for other countries' strategic oil reserves like the agreements that Saudi Arabia has made with China and Japan.

The development of Saudi Arabia's petrochemical, chemical, and plastic industry has been an important element of the Kingdom's economic diversification program. Petrochemicals accounted for 15% of Saudi Arabia's total exports and nearly 61% of total non-oil exports in the year ended 31 December 2015. The expansion of Saudi Arabia's petrochemical industry has been driven by competitive domestic energy costs, although this has now come under pressure from US shale gas production, a ready supply of raw materials, and the government's support of industrial diversification especially through foreign direct joint venture investments. With increased investment and joint venture technological know-how, the Saudi petrochemical industry has undergone significant diversification from basic to more high-value sophisticated or "specialty" products discussed later below.

Saudi Aramco is not the only petrochemical player in Saudi Arabia as this sector is dominated by *SABIC* – Saudi Arabia Basic Industries Corporation – which is 70% owned by the government and the remaining 30% publicly traded on the Saudi stock exchange and is the world's fifth largest chemical company in 2015, according to ICIS Chemical Business. As noted in the previous chapter, *SABIC* was born out of the heavy and chemical industries established by Petromin, and its rapid rise was mostly due to its Chairman and CEO Dr. Mohammed Al Mady during his tenure from 1998 to 2015 before Crown Prince Mohammed assigned him to head the newly established Saudi Military Industrialization Company in 2015. It is not only *SABIC* and Aramco that are involved in the Saudi petrochemical sector but Saudi private sector joint venture companies such as Saudi Acrylic Polymers Company (*SAPCO*)

and Sahara Petrochemicals Company which are playing an important and growing role in the Saudi petrochemical industry. According to *SABIC*, the company operates in more than 50 countries of the world with extensive manufacturing plants, specializing in polymers, specialties, agri-nutrients, and metals. These are listed in Table 2.5.

Table 2.5 SABIC global manufacturing units by ownership stake and products (2016)

Name of company	Location	Products	Ownership (%)
Saudi Iron and Steel Company (Hadeed)	Saudi Arabia	Metals	100.0
Arabian Petrochemical Company (Petrokemya)	Saudi Arabia	Polymers, innovative plastics	100.0
SABIC Innovative Plastics	Various	Innovative plastics	100.0
Saudi Specialty Chemicals Co. (SSCC)	Saudi Arabia	Chemicals, polymers	100.0
SABIC Petrochemicals B.V.	Netherlands	Chemicals, polymers	100.0
SABIC UK Petrochemicals Ltd	UK	Chemicals, polymers	100.0
SABIC Polyolefine GmbH	Germany	Polymers	100.0
SABIC US Holdings LP	USA	Specialties	100.0
Saudi European Petrochemical Co. (I'bn Zahr)	Saudi Arabia	Chemicals, polymers	80.0
Jubail United Petrochemical Co. (United)	Saudi Arabia	Chemicals, polymers	75.0
National Industrial Gases Co. (Gas)	Saudi Arabia	Chemicals	70.0
Yanbu National Petrochemical Co. (Yansab)	Saudi Arabia	Chemicals, polymers	51.0
National Methanol Co. (Ibn Sina)	Saudi Arabia	Chemicals	50.0
Al-Jubail Petrochemical Co. (Kemya)	Saudi Arabia	Chemicals, polymers	50.0
Saudi Petrochemical Co. (Sadat)	Saudi Arabia	Chemicals	50.0
Saudi Methyl Acrylate Co. (SAMAC)	Saudi Arabia	Chemicals, polymers	50.0
SINOPEC SABIC Tianjin Petrochemical Co. Ltd	China	Chemicals, polymers	50.0
Al-Jubail Fertilizer Co. (Al-Bayroni)	Saudi Arabia	Chemicals, agri-nutrients	50.0
Saudi Methanol Co. (Ar-Razi)	Saudi Arabia	Chemicals	50.0
National Chemical Fertilizer Co. (Ibn Al-Baytar)	Saudi Arabia	Agri-nutrients	50.0
Eastern Petrochemical Co. (Sharq)	Saudi Arabia	Chemicals, polymers	50.0
Saudi Japanese Acrylonitrile Co. (Shrouq)	Saudi Arabia	Chemicals	50.0
Saudi Organometallic Chemicals Co. (SOCC)	Saudi Arabia	Polymers	50.0
SABIC SK Nexlene Co. (SSNC)	Singapore	Polymers	50.0

(continued)

Table 2.5 (continued)

Name of company	Location	Products	Ownership (%)
Saudi Yanbu Petrochemical Co. (Yanpet)	Saudi Arabia	Chemicals, polymers	50.0
SABIC SK Nexlene Company	South Korea	Chemicals	50.0
Arabian Industrial Fibers Co. (Ibn Rushd)	Saudi Arabia	Chemicals, polymers	45.2
Saudi Arabian Fertilizer Co. (SAFCO)	Saudi Arabia	Agri-nutrients	43.0
Saudi Kayan Petrochemical Co. (Saudi Kayan)	Saudi Arabia	Chemicals, polymers, innovative plastics	35.0
Gulf Petrochemical Industries Co. (GPIC)	Bahrain	Chemicals, Agri-nutrients	33.3
Gulf Aluminum Rolling Mill Co. (GARMCO)	Bahrain	Metals	30.4
Ma'aden Phosphate Company	Saudi Arabia	Agri-nutrients	30.0
Aluminum Bahrain (ALBA)	Bahrain	Metals	20.6
Ma'aden Wa'ad Al Shamal Phosphate Com.	Saudi Arabia	Agri-nutrients	15.0

Source: SABIC Annual Report 2016, (SABIC 2017, pp. 74–77)

The extensive *SABIC* petrochemical manufacture base, dwarfing Saudi Aramco's own manufacturing capacity in the same sector, raises some fundamental questions on *why the two Saudi companies do not merge their petrochemical operations to ensure synergy in raw material sourcing, marketing, and core research and development, without duplicating efforts*. Should Saudi Aramco be involved in petrochemicals in Saudi Arabia given the dominance of *SABIC* in this market, or can the two companies form a separate joint venture to hold Saudi Arabia-based assets and ensure a fair access to raw material for both parties, especially gas? As Saudi Aramco is the sole producer of this raw material, and given the company's stated objectives to expand further into the petrochemical sector, the alternative for *SABIC* is either to cooperate with Saudi Aramco on domestic gas supplies, to establish joint production, or to make acquisitions and expand abroad.

The consolidation of economic power under the then Deputy Crown Prince Mohammed bin Salman or "MbS" as he is known internationally started the process of closer coordination between *SABIC* and Saudi Aramco, and it was admitted that this had previously not been the case during the lengthy 8-h interview that the Prince held with Bloomberg when the Vision 2030 was being announced (Waldman 2016). Changes at the CEO level for both *SABIC* (Mr. Yousef Al Benyan) and Aramco (Mr. Amin Nasser) also assisted in this process, and during 2016 *SABIC* and Aramco agreed to study establishing the Kingdom's first *oil-to-chemicals* project (Nereim and Wilkin 2016; Arab News 2016c).

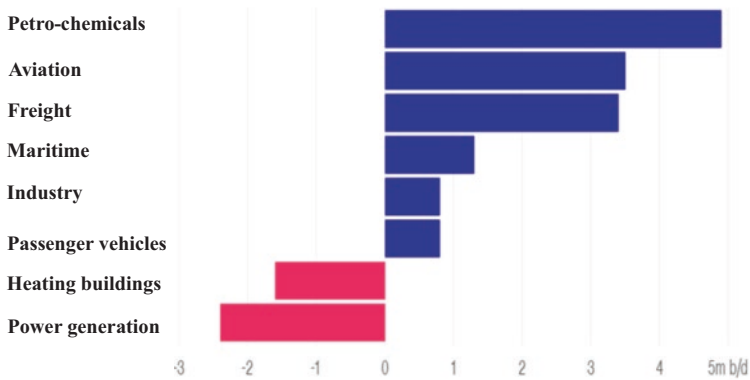
Processing petroleum directly into chemicals will allow Saudi Arabia to cut out a costly intermediate link in the production of plastic. Oil companies normally

refine crude into fuels such as gasoline and diesel and leave by-products such as naphtha to be processed separately into chemicals. According to the joint statement by the two CEOs, the agreement “will help spur a new industrial diversification, job creation and technology development in Saudi Arabia, particularly through downstream conversion of specialty chemicals by small and medium sized enterprises” (Arab News 2016c). While no figures have been officially released for this path-breaking project, some have estimated that it will cost around SR 75 billion (\$20 billion) and help create substantial new jobs and produce 34 million mtpa by 2030 (Shamseddine 2017b). It is not only in Saudi-based joint *SABIC*-Aramco cooperation that is being planned but also internationally when both companies announced their intention for joint US shale gas projects as well as looking at more investments both domestically and abroad (Almashabi 2016).

During its board meeting in Shanghai in May 2017, Saudi Aramco announced the creation of a new subsidiary to conduct Aramco’s chemical business indicating that the company is taking this business segment seriously (Shamseddine 2017b) and that there could be further coordination between *SABIC* and Aramco on the oil-to-chemicals initiatives, given that both companies seem to have pursued this independently, according to SVP Downstream Operations Abdulaziz Al Judaimi (Petroleum Economist 2017).

Increased Integration and a Changed Productive Mix: *SADARA* the Crown Jewel

According to Mr. Judaimi, integrated oil companies, with both upstream and downstream units, normally perform better over the long term and are well positioned to negotiate “soft,” i.e., low oil price patches (Petroleum Economist 2017). The Kingdom has room for greater integration between its oil refining and petrochemical sectors and has moved rapidly in this direction, especially in the construction of the *SADARA* complex and the planned Phase II of the *Petro Rabigh* project which will double the share of ethylene produced in these integrated sites. For now, the Kingdom’s petrochemical sector largely focuses on transforming ethylene and propylene into “basic” molecules like polyethylene and polypropylene, but with further conversion along the value chain into more complex derivative products. The aim is that this shift toward complex derivatives increases the value added of the sector and boosts employment. This is where the *SADARA* petrochemical complex, the “jewel” of Saudi integrated projects, will play a significant role. This optimism seems to be well placed, as demand growth for petrochemical use is forecasted to accelerate by 2040, while demand growth from transport slows as illustrated in Fig. 2.5.

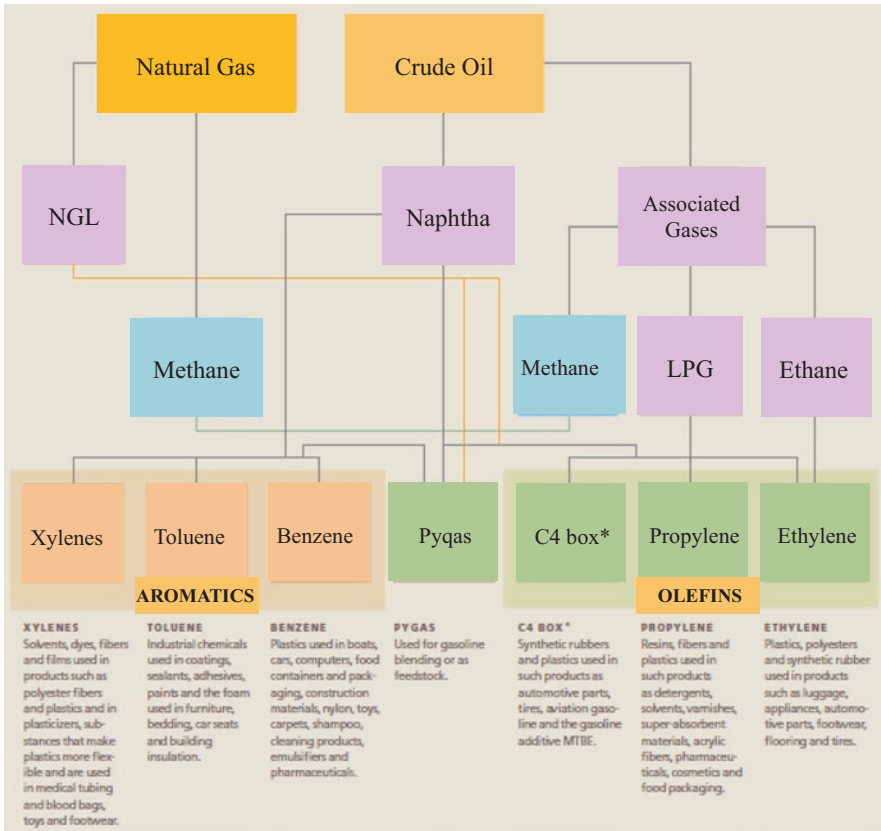
Fig. 2.5 Forecasted petrochemical demand by 2040 (Million b/d)

Source: Blas (2017a)

Figure 2.5, based on International Energy Agency (IEA) estimates, predicts demand for passenger-vehicle fuel will increase just 0.1% a year through 2040, compared with a 1.5% annual rise in petrochemical consumption. Aramco has seen fit that it needs to adapt to the dramatic changes that this global energy use brings with it, with the petrochemical sector acting as a catalyst to spur manufacturing and foster the growth of local industry, which is at the heart of Vision 2030.

SADARA, the new \$20 billion joint venture between Saudi Aramco and Dow Chemical Company of the USA, has nearly completed the construction of its integrated chemical complex, taking more than 60,000 workers 5 years to assemble and emblazoned with the words “Game Changer!” on its website (Blas 2017a). According to Mr. Ziad Al Labban, former *SADARA* CEO, the complex consists of 26 chemical plants, 14 of which will produce products never before manufactured in Saudi Arabia, and all units operational by the mid-2017 (Sequeira 2017). According to Mr. Labban, the new chemical plants will produce ethylene oxide, glycol isocyanates ethers, propylene oxide, propylene glycol, and polyol. The naphtha mixed feed cracking plants which are at the heart of the operation will produce heavier feedstock products which can be used to produce specialty petrochemicals, as naphtha-based feedstock is cost-effective and will have a financially attractive market niche as global demand for ethylene cannot be met by shale gas-derived feedstock alone (Sequeira 2017). Figure 2.6 illustrates the gas and oil input and output matrix for the petrochemical industry.

Fig. 2.6 Petrochemical input supply and output matrix



PETROCHEMICALS

The petrochemical industry converts crude oil and natural gas into basic petrochemical building blocks that, in turn, are used to produce consumer goods ranging from heart valves to raincoat

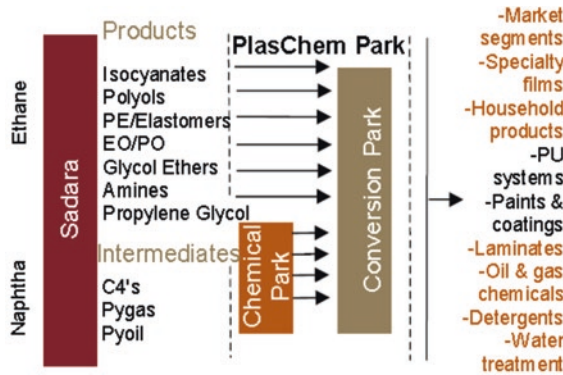
Note: * Butylene, butadiene, and derivatives

Source: Saudi Aramco (2011b, p. 193)

In relation to the planned Aramco IPO of the mother company, according to the *SADARA* CEO, Saudi Aramco will initiate any IPO concerning *SADARA*, and the 30% flotation of *SADARA*, expected since 2014, will come from Aramco’s share of *SADARA* and not affect Dow’s equity share of 35%. This would leave Aramco’s share and Dow’s at 35% each, following a 30% sale from Aramco’s share, but that Aramco is the one to make a final decision on the timing and sale of the planned 30% *SADARA* share. However, in August 2017, both Dow and Aramco signed an MOU to increase Dow’s 35% stake in Sadara by acquiring an additional 15% to bring the two joint venture partners to 50:50 ownership level (Argaam 2017m).

Whatever final decision is made concerning a partial floatation of *SADARA* on the local stock exchange or as part of a global and domestic Aramco IPO, the fact is that once *SADARA* becomes fully operational in 2017, it will be the largest integrated energy and chemical complex in the world and help develop the Kingdom’s non-oil manufacturing and technology sector through the introduction of new chemical products as illustrated in Fig. 2.7.

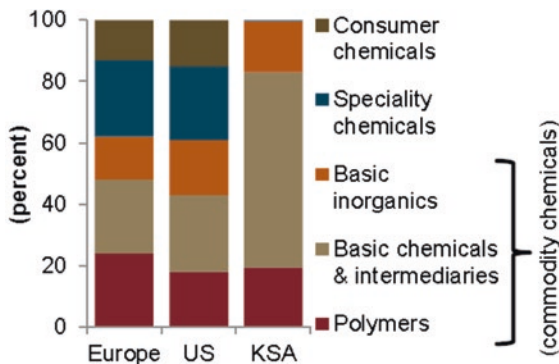
Fig. 2.7 *SADARA*’s range of new chemical products



Source: Jadwa Investment (2017c, p. 6)

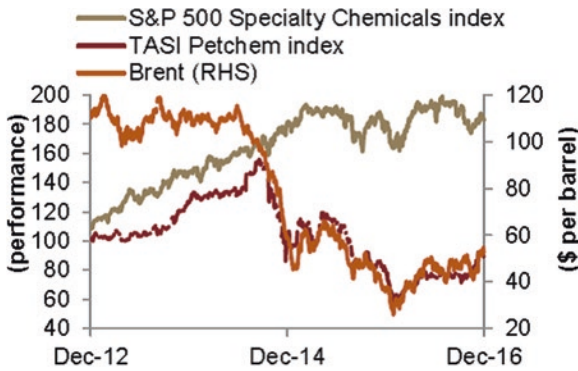
Despite progress in this sector in Saudi Arabia, the Kingdom still lags behind European and US petrochemical producers who lead in specialty chemicals, with Saudi Arabia’s chemical production still geared toward “basic” commodities as illustrated in Fig. 2.8, while Fig. 2.9 illustrates that demand for specialty chemicals is far superior in returns to investors, and it also tends to exhibit lower price volatility with oil prices.

Fig. 2.8 Saudi petrochemical production compositions compared with Europe and USA



Source: Jadwa Investment (2017c, p. 5)

Fig. 2.9 Specialty chemicals exhibit lower correlation to oil prices and produce higher returns

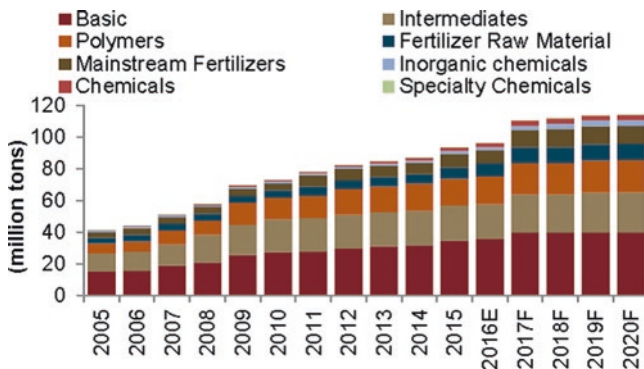


Note: * Indices rebased to 100 in October 2012

Source: Jadwa Investment (2017c, p. 6)

It is interesting to note the close correlation of oil prices represented by Brent and the TASI (Saudi stock exchange) Petchem Index. Due to the linkages between crude oil and petrochemicals, high oil prices as noted in Fig. 2.8 for the period from December 2012 to December 2014 resulted in higher prices for chemical products, and the companies involved in this sector enjoyed high profit margins due to higher prices and a lower cost base. The prominent role of petrochemicals in the non-oil economy has been identified as central in the National Transformation Program (NTP) 2020 and the Vision 2030, to reduce the Kingdom’s reliance as a fossil fuel producer, and the growth of the petrochemical sector is expected to add more capacity by 2020 as illustrated in Fig. 2.10.

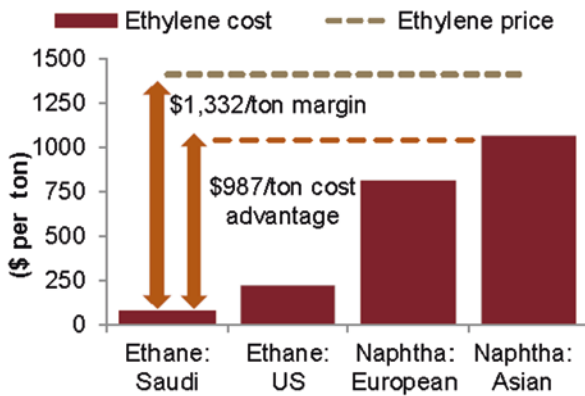
Fig. 2.10 Forecasted Saudi petrochemical capacity 2005–2020 by category of chemical output



Source: Jadwa Investment (2017c, p. 1)

In the decade to 2015, the Saudi petrochemical sector witnessed the “takeoff” of the industry, boosted by high oil prices as noted earlier, which resulted in chemical capacity expansion by around 115% between 2005 and 2015 as illustrated in Fig. 2.8. What Fig. 2.8 also highlights is the forecasted gradual increase in the specialty and polymer components by 2020. Saudi Arabia still has a comparative cost advantage in its production of ethylene, the natural gas-derived product, over European and Asian producers, but the gap is narrowing in relation to more abundant and cheap US ethane shale-gas production, and it is not surprising that both Aramco and SABIC are looking into investing in this sector as noted before. Despite raising of Saudi ethane price from \$0.75 mmbtu to \$1.75 mmbtu in 2016, the Kingdom still retains a cost advantage as illustrated in Fig. 2.11.

Fig. 2.11 Comparative cost for production of a ton of ethylene for Saudi Arabia and US, European, and Asian producers (2014)



Note: Brent oil price in October 2014: \$87 pb
 Source: Jadwa Investment (2017c, p. 3)

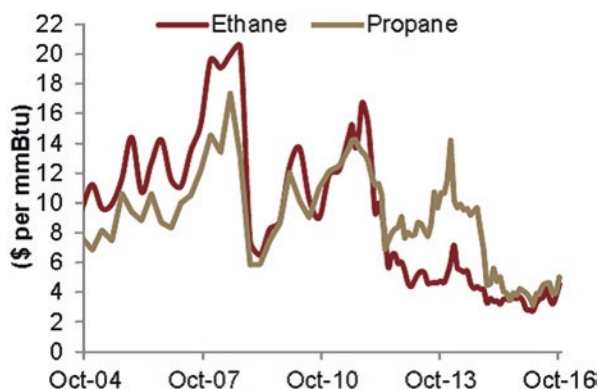
While the above cost of production between Saudi Arabia and other geographic sectors is based on an oil price of around \$87 pb in October 2014, the fall in prices to around \$45–\$50 pb levels in 2017 has maintained Saudi Arabia’s production cost advantage, aiding Saudi Arabia to make inroads in the international export markets. This amounted to \$30 billion in petrochemical exports in 2015, i.e., 60% of total non-oil exports. Vision 2030 aims to push the Kingdom’s non-oil export target from around 16% of GDP in 2015 to 50% of GDP by 2030 (Saudi Arabian Government 2016a, Vision 2030 official website).

Challenges and Opportunities

A combination of lower oil prices from year-end 2014, and naptha prices, as well as declining US ethane prices, combined with a rise in Saudi ethane and methane prices, has now reduced cost differentials between the Kingdom and other regions,

with the USA becoming a serious long-term challenger. As we will note in the next chapter, the Kingdom has outlined its plans to reform domestic energy prices to as a yet unspecified benchmark price through 2020, similar to the energy price reform carried out by the United Arab Emirates (UAE). While the Saudi plan is somewhat more cautious than that of the UAE, the Kingdom will not change its natural gas/ethane and LPG prices until 2020, to give time for the local petrochemical players to adjust their operational cost structure, but will undoubtedly put pressure on Saudi petrochemical profitability margins. This is an important lifeline thrown by the Saudi government to local petrochemical manufactures and one of the main drivers for the new found cooperation between the two Saudi chemical giants, SABIC and Saudi Aramco. The challenges that they will face in the short term will mainly come from the USA, and as Fig. 2.12 illustrates, the American shale oil boom has led to a sharp reduction in US ethane and propane prices.

Fig. 2.12 US ethane and propane prices have fallen, spurred by a US shale boom



Source: Jadwa Investment (2017c, p. 9)

The US shale oil boom was preceded by large-scale rises in US shale gas production, which not only depressed US gas prices but also petrochemical feedstock prices. At the end of 2016, US ethane prices had dropped by 67%, while propane prices were also down by 51% since 2010, giving the US petrochemical sector a huge incentive to invest in petrochemical infrastructure (Jadwa Investment 2017c, p. 9). But it is not only from the USA that Saudi Arabia faces a long-term threat to its exports but also from Iran as the lifting of most nuclear-related sanctions in January 2016 has paved the way for potential large-scale expansion in Iranian petrochemical capacity and renewed drilling in its *South Pars* Field, the largest non-associated gas field in the world, shared with Qatar. According to Iran's National Petrochemical Company, the annual petrochemical capacity totals 59 mt, with production at 49 mt, and the country plans to double its capacity by 2021, which would make Iran possess the largest petrochemical capacity in the Gulf.

The attraction of this large Iranian market segment has induced Western companies to start investing in Iran, with both the French company Total and the German carmaker Volkswagen AG announcing investments in Iran, highlighting a widening rift between US President Trump and European allies (Motavalli 2017). The agreement with Total is significant, with the company planning injecting around \$48 billion into Iran which could encourage other foreign energy companies to follow suit, like Royal Dutch Shell and Eni of Italy, as the Total deal was a landmark breakthrough (Motavalli 2017). Total will develop Phase 11 of Iran's *South Pars* and will be the operator with a 50.1% stake, alongside Chinese-owned oil and gas company CNPC with 30%, and the National Iranian Oil Company subsidiary Petropars with 19.9%. The project will have a production capacity of two billion cubic feet per day with the gas supplying the Iranian domestic market starting in 2021 (Sharafadin 2017).

The above long-term challenges to the Saudi petrochemical industry are not to be underestimated, but Saudi Aramco is also opening up new opportunities in both the West and the East to ensure that it remains a significant player in this sector, as the Saudi government has made it clear through both Vision 2030 and NTP 2020 that the petrochemical sector's importance in generating non-oil income will be fully supported.

According to Mr. Abdulaziz Judaimi, Aramco SVP for Downstream Operations, Aramco has a long-term strategy for downstream growth and expansion particularly in China, Malaysia, Indonesia, and India (Petroleum Economist 2017). In the West, Aramco marked a significant milestone to become a globally integrated energy and chemical company when its subsidiary, Aramco Overseas Company B.V. (AOC) and LANXESS, a German specialty chemical company, signed an agreement in 2015 to create ARLANXEO, a 50/50% joint venture company to develop, produce, and market performance polymers used by the global tire and auto parts manufacturers and a construction of life science industries (Saudi Aramco 2016b, Annual Review 2015). According to the company, the new European joint venture will help to "unlock the full economic potential of the Kingdom's hydrocarbon resources and potentially enables opportunities for further economic diversification and job creation" (Saudi Aramco 2017e, Annual Review 2016, p. 29). According to Aramco, the research programs undertaken by the German joint venture, such as development of energy-saving tires, will complement Aramco's own research into fuel-efficient engines. This is not an idle boast, as the Kingdom is pursuing its own car manufacturing hubs, with the Japanese auto giant Toyota and Saudi Arabia's national cluster development program setting up a feasibility study of building a factory to manufacture sport utility vehicles (SUVs) and parts in the Kingdom (Kibe 2017). The French company Total has not only been actively prospecting opportunities in Iran but also held talks with Saudi Aramco to build a mixed feed cracker and derivatives with an expected annual capacity of 1.5 million tons in *Jubail* near their joint refining and

chemicals complex *SATORP*, with the expected cost of the joint venture ranging between \$3 billion and \$5 billion. The feedstock would be provided by *SATORP* and expanded on the current 400,000 bpd *SATORP* refinery's integrated petrochemical complex (Shamseddine 2017c). Once completed, this Aramco-Total joint venture expansion will add to the other state-of-the-art chemical complex, *SADARA* noted earlier, and increase output in high-value chemical derivatives.

The Glittering Prize: The Far East Connections

As noted earlier, the bulk of Saudi Arabia's crude and refined products are exported to Far East Asian markets, and it is worth noting that Riyadh's "Look East" is not sudden but is borne of a strategic plan incorporating the priorities of the National Transformation Plan and Saudi Arabia's broader global agenda. The Kingdom, like many others in the region, whether it is Iraq, Kuwait, the UAE, or Iran, is betting on the center of economic and political gravity in global affairs shifting away from the West and toward the East in the coming years. This fits in with Saudi Arabia's dramatic reform plans under Crown Prince Mohammed bin Salman to overhaul its economic model, as well as a historic bid to maintain its position as the leader of the Sunni Muslim world. To this end, pursuing and strengthening ties with key countries in the Asia-Pacific region becomes nonoptional and a must.

During the period late February to March 2017, King Salman bin Abdul-Aziz of Saudi Arabia, along with key government Ministers, private sector Executives, and Saudi Aramco officials, carried out an extensive visit to Malaysia, Indonesia, Brunei, Japan, China, and the Maldives (Rasooldeen 2017; Defterios 2017). Energy relations took center stage during the tour with many agreements signed as discussed below, but another aim was to showcase the planned Saudi Aramco IPO to Chinese and Japanese stock exchanges, discussed more fully in a later chapter. The King's Asia trip seemed to have also come at an opportune time with the unveiling of the ambitious "One Belt, One Road" plan by Chinese President Xi Jinping, with the aim of connecting China with over 60 countries, from Asia to the Middle East and Europe through the rebuilding of infrastructure to facilitate trade. The Chinese initiative also fits in well with Crown Prince Mohammed's Vision 2030, which, while having its objective to reduce the Kingdom's "addiction to crude oil" exports, also aims to make the Kingdom a competitive hub for trading and services (Defterios 2017). In this grand scheme, Saudi Aramco is slated to play an important role.

Table 2.6 summarizes the key investment highlights signed during the King's Asia visit.

Table 2.6 Investment highlights of King Salman bin Abdul-Aziz Asia tour, February–March 2017

Country	Key agreement signed
• Malaysia	<ul style="list-style-type: none"> • Four memorandum of understanding (MOUs) and seven agreement worth over SR 8 billion (\$2.1 billion) in different sectors • Aramco to invest \$7 billion in an oil refinery to be built by <i>Petronas</i> in Johor, Malaysia
• Indonesia	<ul style="list-style-type: none"> • 11 agreements signed in various fields such as SMEs, healthcare services, air cargo and freight, and fish resources • Saudi Aramco signed a JV agreement with Indonesian oil company <i>Pertamina</i> in Central Java, with Aramco owing 45% of the JV
• Brunei	<ul style="list-style-type: none"> • Bilateral agreements in the field of economy, investment, education, culture, youth, and sports
• Japan	<ul style="list-style-type: none"> • Three MOUs • Saudi National Cluster Development Program signed agreement with Toyota to study an SUV facility in Saudi Arabia • Japanese Exchange Group signed MOU with Saudi stock exchange <i>Tadawul</i> to enhance market development • <i>Softbank</i> and PIF discussions for participating in the \$100 billion technology investment fund • Japan to consider Saudi Aramco IPO for a Tokyo listing
• China	<ul style="list-style-type: none"> • 14 MOUs signed, potentially worth \$65 billion, covering a wide range of areas in energy, culture, education, and technology, involving 35 projects • China to consider Saudi Arabia's IPO listing on the Shanghai and Hong Kong exchanges • Discussions between Saudi Aramco and China North Industries Group Corp. (NORINCO) to build a refinery and chemicals complex

Sources: Latiff (2017), Aizhu (2017), Tan (2017), and Rasooldeen (2017)

The agreements signed by Saudi Aramco are significant steps to expand the company's footprint in the global petrochemical and refinery business and whether they will be part of Saudi Aramco's planned IPO or does not detract from their potential impact to Aramco's future revenue diversification. Each one of the agreements reached with the Asian countries adds depth to Aramco's presence in the host country and assures Aramco of long-term crude and feedstock markets. In Indonesia, according to Aramco, the Saudi company has been selected as the strategic partner for the country's Refinery Development Master Plan Project of *Pertamina*, a national oil company, with the aim to progress for joint ownership, upgrade, and operation of *Pertamina's Cilacap Refinery* in Central Java. Under this agreement, the refinery's capacity will be expanded to 400,000 bpd designed to process Arabian crude oil to produce refined products that meet Euro V specifications, basic petrochemicals, and Group II base oil for lubricants (Saudi Aramco 2017e, Annual Review 2016, p. 29).

In Malaysia, Aramco will invest \$7 billion into an oil refinery and petrochemical project in Malaysia's southern state of *Johor*. The agreement is between Saudi Aramco and Malaysia's state-owned energy company *Petroliam Nasional Bhd (Petronas)*, the sponsor of the country's ambitious \$27 billion Refinery and

Petrochemical Integrated Development (RAPID) project. The RAPID project is expected to begin operations in the first quarter of 2019 and will contain a 300,000 bpd refinery and cracker petrochemical complex, with a production capacity of 7.7 million metric tons. The RAPID project also aims to expand capacity to 400,000 bpd to produce refined products that meet Euro V specifications and basic petrochemicals, with Aramco owing 45% and *Petronas* 55% (Latiff 2017).

In China, Saudi Aramco signed agreements with the Chinese defense conglomerate, China North Industries Group Corp (NORINCO), to build a refinery and chemicals complex in Northeast China, which would include a 300,000 bpd refinery and an ethylene complex with an annual capacity of 1 million tons, estimated to cost around \$10.09 billion, and boost Aramco's presence in China's massive refining industry, and add to its 25% stake in the Fujian refinery operated by state refiner Sinopec (Aizhu 2017). According to Aramco's CEO Mr. Amin Nasser, another MOU signed with the Chinese *Aerosun* Corporation involves manufacturing of reinforced thermoplastic (RTP) pipes as well as research and development which will utilize Aramco's crude oil-to-chemicals initiative, "eliminating the entire refining step of the process which could change the competitive dynamics of petrochemical feedstock and assist in developing advanced new materials and enable new uses" (Argaam 2017k). In August 2017, Saudi Aramco announced that it also expected to sign a final deal with Petrochina, the second largest Chinese state refiner, to invest in its *Yunnan* refinery and that Aramco will own a "big stake" in the 260,000bpd *Anning* plant with an estimated investment of around \$1bn–1.5bn in the refinery as well as in the retail assets of Petrochina (Arab News 2017c).

Although King Salman did not visit India on his 2017 Asia trip, the Kingdom is eyeing the Indian market for further expansion, and as noted earlier, Aramco has opened an office in New Delhi. The company has started preliminary discussions during the mid-2017 with the Indian Oil Corporation (IOC), India's top refiner on downstream investment opportunities, centered around a 1.2 million bpd refinery-to-petrochemical megaproject in India's West Coast. According to reports, the IOC is looking to invest about \$30 billion in 5 years, most of which will be spent on fuel upgradation projects and petrochemicals. The International Energy Agency (IEA) estimates India's refining capacity, the fourth biggest in the world, would lag local fuel demand going forward, requiring investment in more plants (Tan 2017).

Something New Under the Sun: Saudi Arabia's Renewable Energy Program

The Kingdom has made its objectives clear on the issue of renewable energy, particularly solar and wind, that they lay at the heart of its efforts to move forward and help optimize Saudi Arabia's energy mix. Progress has already been made with Saudi Aramco working closely with the Saudi Electricity Company to install ten monitoring stations at various project sites to calculate potential energy yields and

determine the best locations for siting future solar power facilities. At Aramco's *Tabuk* Bulk Plant, the company commissioned a 1 megawatt pilot project using concentrated photovoltaic technology, the first such utility scale plant in the Middle East (Saudi Aramco 2016b, Annual Review 2015, p. 68). Committing the Kingdom to renewable energy also achieves part of the National Transformation Plan (NTP) and Vision 2030. Through the NTP, the Kingdom is targeting 3.4 GW of renewable energy by 2020 and 9.5 GW by 2023. The 9.5 GW will result in avoiding 16–18 million tons of CO₂ per year by 2023, reducing the Kingdom's greenhouse gas emissions and will contribute to global climate efforts, as outlined in the Paris Climate Agreement of 2016. By 2023, the percentage of renewable energy will be around 10% of totaled installed capacity in the Kingdom.

To underscore its commitments to renewable energy, the Kingdom will develop 30 solar and wind projects over the next 10 years as part of Saudi Arabia's \$50 billion program to boost power generation and cut its oil consumption (Mahdi and Nereim 2017). While Saudi Arabia aims to develop almost 10 gigawatts of renewables by 2023, the country generated a modest 30–40 megawatts of power from renewables in 2016, Saudi Aramco generated 6 gigawatts of electricity per year, but it has been interested in participating in the bidding for renewable projects, which has attracted local and international companies for both solar and wind renewable projects noted in Table 2.7.

Table 2.7 Companies qualified for Saudi renewable energy projects

Managing and technical members	Managing members	Technical members
(A) Solar projects		
Acciona Energia Global S.L.	Abu Dhabi Future Energy Co. (Masdar)	Canadian Solar Inc.
ACWAPOWER	Cobra Instalaciones y Servicios S.A.	Enerparc Projects GmbH
Belectric (RWE Group)	JGC Corporation	Fotowatio Renewable Ventures (FRV)
EDF Energies Nouvelles	Nebras Power	GCL New Energy
First Solar Int'l Middle East	Korean Electric Power Corporation (KEPCO)	Hanwha Q Cells Co.
Enel Green Power S.p.A	SNC-Lavalin Arabia LLC	ISERDROLA RENOVASLES ENERGIA S.A.U.
International Power SA (ENGIE) (Dubai)	Sojitz Corporation	Jinko Solar
Marubeni Corporation	Tenaga Nasional Berhad	Trina Solar Limited
Mitsui & Co		TSK Electronica Y Electricidad
Total Energies Nouvelles Activities USA		
(B) Wind power		
Abu Dhabi Future Energy Co.	ACWAPOWER	Elecnor

(continued)

Table 2.7 (continued)

Managing and technical members	Managing members	Technical members
ACCIONA Energia Global S.L	JGC Corporation	Enercon
Cobra Instalaciones y Servicios S.A.	Korea Electric Power Corporation (KEPCO)	Xinjiang Goldwind Science & Technology Co (Goldwind)
EDF Energies Nouvelles	Nebras Power	IBERDROLA RENOVABLES ENERGIA S.A.U.
Enel Green Power S.p.A	SNC-Lavalin Arabia LLC	Siemens Project Ventures GmbH (SPV)
International Power SA (Dubai Branch) (ENGIE)	Sojitz Corporation	Voltaia S.A.
Gamesa Energia S.A.		Vestas Middle East
GE		
Marubeni Corporation		
Mitsui & Co		
Toyota Tsusho Corporation (TTC)		

Source: Argaam (2017)

According to the Ministry of Energy, a total number of 27 companies have qualified for the 300 megawatt (MW) solar project and 24 firms for the 400 MW wind farm from a total of 128 applications under the auspices of the newly established Renewable Energy Project Development Office which ensures there is a focal point for Saudi renewable energy-related projects. Importing foreign technical expertise and partners to participate in the Kingdom's renewable energy program is common in developing economies in the short and medium term, but some countries opt to develop their own technology and skills in this area. Saudi Aramco has been at the forefront of the renewable R&D effort. While current renewable, especially solar output is still modest, this will not stop Saudi Arabia from becoming "nothing less than a solar powerhouse," according to Aramco CEO Amin Nasser (Mahdi 2017b).

Technology and Research: A Must for Long-Term Survival

Saudi Aramco has established a wide range of relationships, whether technical, academic, or commercial which are leveraged to expand the company's technology and research mandate. Saudi Aramco's overall research strategy is summarized in Table 2.8.

Table 2.8 Saudi Aramco major research strategy

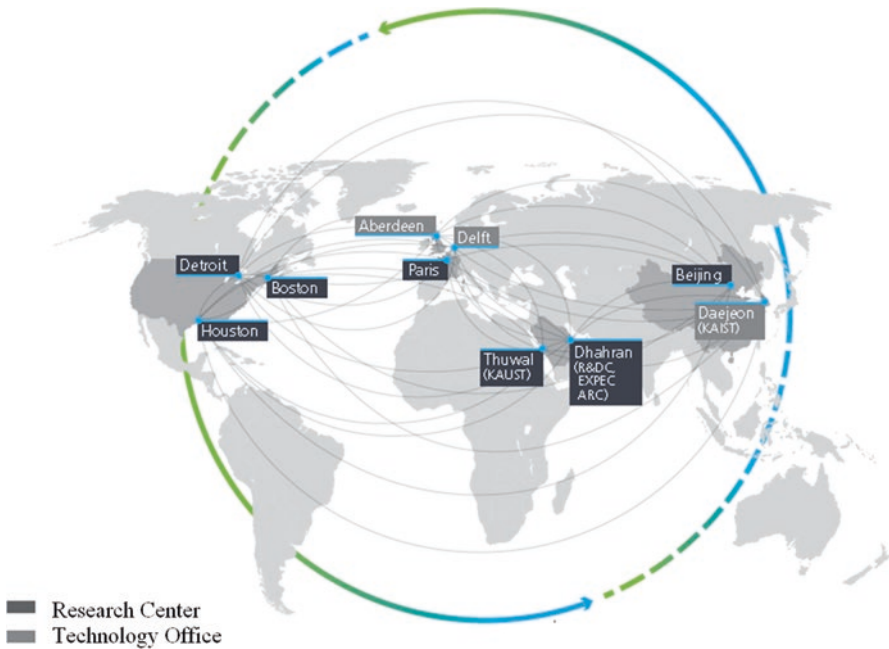
Business segments	Focus areas		Goals
Upstream	<ul style="list-style-type: none"> • Reservoir engineering • Computational modeling • Production 	<ul style="list-style-type: none"> • Drilling • Geophysics • Geology 	Increase discovery and recovery of oil
Downstream	<ul style="list-style-type: none"> • Oil and gas treatment • Oil upgrading • Advanced materials 	<ul style="list-style-type: none"> • Chemicals • Network integrity 	Develop processes and improve production and refining efficiencies to maximize the value of hydrocarbon resources
Strategic	<ul style="list-style-type: none"> • Fuel/engine technology • Carbon management 		Support the long-term sustainability of oil

Source: Saudi Aramco (2015) Citizenship Report 2014, Knowledge. pp. 54/55

From Table 2.8, overall Aramco goals reveal that while it is taken for granted that the company continues to carry out research and development in the upstream sector to increase discovery and recovery of oil and gas, the downstream R&D is also important to the company's refining efficiency in the high value-added chemical sector. The third objective is basically self-preservation, to ensure that oil still has a relevant role to play in the long term, especially in the development of fuel-efficient engines and carbon management. This is not surprising as some countries, like France, announced that it would ban all petrol and diesel cars by 2040 (Chrisafis and Vaughan 2017). The decision by the new French President Emmanuel Macron came after Volvo the car manufacturer said it would only make fully electric or hybrid cars from 2019 onward, paving the way for other auto manufacturers to follow suit, as well as major industrial countries. In July 2017, the UK followed suit and announced that Britain is to ban sale of all new diesel and petrol cars and vans from 2040 due to poor air quality and its impact on people's health (Asthana and Taylor 2017). These moves are a warning bell to Aramco.

To meet future challenges, Saudi Aramco has established a "Global Research Network" with advanced R&D centers in Saudi Arabia as well as in North America, Europe, and Asia, illustrated in Fig. 2.13.

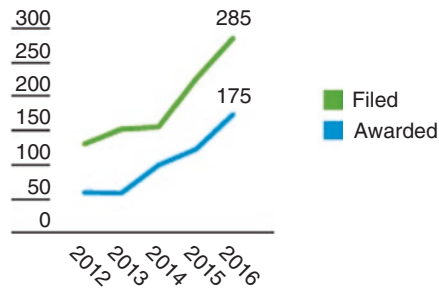
Fig. 2.13 Saudi Aramco’s global research network



Source: Saudi Aramco Citizenship Report 2014 Knowledge (2015, pp. 54/55)

In 2016, Saudi Aramco expanded its collaboration between its Aramco Research Centers in Detroit, Boston, and Houston with the renowned Massachusetts Institute of Technology’s Energy Initiative (MITEI) to support research by two low-carbon energy centers designed to address climate change challenges. In Saudi Arabia, a key development during 2016 was commencing the expansion of the Exploration and Petroleum Engineering Center-Advanced Research Center (EXPEC-ARC). The new EXPEC-ARC projects are focusing on sustainability technologies. Besides the above Saudi research initiatives, a new research center was opened at KAUST which is expected to support research in areas of chemicals, intelligent systems, solar energy, reservoir engineering, computational modeling, and environmental protection (Saudi Aramco 2017e, Annual Review 2016, pp. 41–42). Internationally, Aramco has research centers in Beijing, which conducts research on chemical-enhanced oil recovery and advanced seismic imaging technologies, as well as in South Korea in collaboration with one of the top-ranked global universities, the Korea Advanced Institute of Science and Technology (KAIST).

The above has spurred Saudi Aramco to contribute to the Saudi knowledge economy through an effective and practical Intellectual Property (IP) program that supports research designed to address specific energy challenges, targeting areas where IP protection can provide a competitive advantage. By 2016, Saudi Aramco had been awarded 175 patents with another 285 patents filed as illustrated in Fig. 2.14, demonstrating the impressive growth in patents.

Fig. 2.14 Saudi Aramco patents filed and awarded 2011–2016

Source: Saudi Aramco, Annual Report, 2016, p. 35

Saudi Aramco believes that commercializing IP is essential to creating the leading business of tomorrow, and the Kingdom’s various universities have made significant strides in this respect, ranking the Kingdom first among Arab countries in globally registered patents, holding 45% of total Arab patents. Saudi Aramco has taken a lead role in forming the Saudi Arabia Advanced Research Alliance (SAARA) bringing together various entities like KAUST, KFUPM, KACST (King Abdul-Aziz Center for Science and Technology), and TAQNIA (the Saudi Technology Development and Investment Company). As a result of this local and international academic alliance, a new company called “TECHNOVIA” is being formed by Aramco to bridge the gap between the discovery of ideas and their practical application and commercialization. To this end, Saudi Aramco also formed, in association with TAQNIA and KACST, the Saudi Company for Research Elements (SARE) to provide a comprehensive supply chain management service for all in-Kingdom research centers and universities. In 2015, Saudi Aramco took the initiative to create a new College of Petroleum Engineering and GeoSciences at KFUPM, a project that includes the construction of a new laboratory building and the establishment of a private subsidiary company under the Dhahran Techno Valley Company (DTVC) to support associated nonacademic activities. A Joint Innovation Center has also been established at DTVC to pursue information and communications technologies for the oil and gas industry.

In a practical manner, Saudi Aramco has been actively engaged in carbon management initiatives within the oil industry. A comprehensive research framework has been developed for carbon capture and storage (CCS), including CO₂ capture (mobile capture, oxy-fuel combustion, and chemical looping combustion), storage and enhanced oil recovery (EOR) technologies (Al Meshari 2011). Saudi Arabia is a signatory of the Kyoto Protocol (and the subsequent Paris Climate Change Accord), and it committed to shoulder a fair share in tackling climate change based on the principle of “common but differentiated responsibility” but has denied any policies that discriminate against petroleum or fossil fuels in general (Liu et al. 2012; Ramady and Mahdi 2015). Saudi Arabia is also a member of the Carbon Sequestration Leadership Forum (CSLF), a voluntary climate initiative of devel-

oped and developing countries focusing on development of improved cost-effective technologies for the separation and capture of CO₂ for its transport and long-term safe storage. In addition, Saudi Arabia, Norway, the Netherlands, and the UK launched the Four-Kingdom CCS Initiative to seek potential collaboration on CCS among oil-producing nations (Liu et al. 2012).

The results in CCS have been impressive and include:

- *An inboard system capable of capturing 25% of CO₂ emitted through vehicular exhaust systems, with a goal to capture as much as 60%*
- *Sequestration and enhanced oil recovery located in the North Uthmaniyah area of the Ghawar field with an expected gain in oil recovery from CO₂ injection between 7–9% and permanently sequester roughly 40% of the injected CO₂*
- *State-of-the-art monitoring and surveillance plan to track the CO₂ plume in the subsurface, monitor the performance of the CO₂ injection process, and novel chemical tracers to monitor CO₂ saturation*

Other significant technological breakthroughs achieved by Saudi Aramco, to place it among top NOCs in this field, are:

- *The first industry's trillion-cell simulation and hydrocarbon migration algorithmic, run on the latest evolution of Aramco's proprietary POWERS (Parallel Oil and Water Enhanced Reservoir Simulator) technology that was developed in-house.*
- *The development of Tera POWERS to model the physics of hydrocarbon reservoirs from their original generation to their final production, from microscopic rock pore scale to giant field and basin scale.*
- *In-house geochemical techniques to help evaluate the distribution, migration, and accumulation of subsurface fluids.*
- *Developing and testing two autonomous underwater vehicles designed to acquire seismic data in shallow offshore environments, reducing data acquisition by 30% and speed up data acquisition by 50% and more cost effectively.*
- *SmartWater Flood research program to improve oil recovery rates from carbonate reservoirs by an additional 4–8%.*
- *Optimizing drilling performance and maximizing recovery from gas wells by the use of underbalanced coiled-tubing drilling, whereby in 2016 this technology helped mitigate formation damage to achieve a production rate of 60 million scfd from a gas well.*
- *Aramco has continued to investigate a cable developed electric submersible pump (ESP) systems that can be developed and retrieved in 1 day using the pump's power cable, thereby eliminating the need to use a work over rig and reduce costs while boosting oil recovery.*
- *High-temperature fracturing fluid system using untreated seawater and designed to conserve freshwater and treated seawater to be tested in 2017.*
- *A novel approach to address the challenge of losing drilling fluids and mud in drilling operations of using local date free seeds and fibers as loss circulation materials (Saudi Aramco 2017e – Annual Review, 2016).*

The above wide-ranging R&D programs are part of Saudi Aramco's \$300 billion expenditure over the next decade to maintain its spare oil production capacity and to explore for more nonassociated natural gas. According to Aramco CEO Amin Nasser, there is some suggestion that at least 20 million bpd of new output is needed over the next 5 years to offset rising oil demand and natural field declines. The CEO's message is clear: Saudi Aramco would continue to expand its capacity and technical expertise so as to dispel "misleading peak oil demand and stranded resources" (Mahdi 2017b).

The Saudi Aramco Petrochemical Sector and the Planned IPO

The survey of the Saudi petrochemical sector, and specifically Saudi Aramco's broad range of domestic and international chemical assets, indicates that inclusion of this sector can potentially add value to the planned Aramco IPO. The previous chapter also revealed the extensive R&D process of Saudi Aramco, which adds value to the company, as international oil companies (IOCs) generate significant bottom-line revenue by leasing such advanced technologies to third-party operators or NOCs. Saudi Aramco can do this through one or more of its specialized technology companies noted earlier. Listing part or all of Saudi Aramco's refinery and petrochemical assets poses some issues however that need to be addressed if the company decides to include such assets in any eventual IPO. Table 2.9 summarizes some of the main issues that might be faced by the company.

Table 2.9 Saudi Aramco options for including downstream assets in a planned IPO

IPO options	Key issues and observations
A. All Saudi Aramco domestic and international downstream assets	<ul style="list-style-type: none"> • Difficulty in valuing assets of different age, product output, and joint venture equity ownership • Different ownership locations (Saudi Arabia, USA, Europe, Asia) whereby local regulators' approval is required for partial flotation, as well as stringent requirement for audited financial data • Issue of domestic energy price subsidies in valuing domestic assets
B. Wholly owned Saudi Aramco domestic and international assets	<ul style="list-style-type: none"> • Difficulty in valuing assets of different age, product output • Ownership of international wholly owned assets may require regulatory approvals and stringent audited financial data • Issue of domestic energy price subsidies in valuing wholly owned domestic assets
C. Wholly owned Saudi Aramco domestic assets	<ul style="list-style-type: none"> • Difficulty in valuing assets of different age, product output • Requirement for audited financial data • Approval from local <i>Tadawul</i> exchange for IPO and whether this will also be open to international investors or to domestic investors only • Issue of domestic energy price subsidies in valuing domestic assets

A scan of Table 2.9 indicates that Option C, the IPO of wholly owned domestic Aramco assets, seems the most manageable, given the complexity of partial or full flotation of either wholly owned or partially owned international assets with differing regulatory listing requirements and possible objection by joint venture partners. It is still not clear whether Saudi Aramco will include any or all of its downstream assets in the planned IPO, except for some indication that this was the case during the various interviews and comments by Crown Prince Mohammed bin Salman and senior Aramco officials. Whatever is finally decided, the company Chairman and Minister of Energy Mr. Khalid Al-Falih noted in the 2016 Aramco Annual Review that “the most notable feature of the Kingdom’s transformation will be the future offering of part of the company’s shares in local and international stock markets” and that “this move drives further diversification and growth of the national economy while elevating the international visibility of the company’s decision making and governance, and building confidence in its long-term strategy” (Saudi Aramco 2017e, Annual Review 2016, p. 10). These are indeed clear objectives, which will be examined more closely in the following chapters to assess the requirements for meeting international board and company governance, as well as the steps required for listing in international stock exchanges.

Chapter 3

Aramco's New 2030 Vision and Mission Mandate: Managing Expectations

It must be considered that there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle than to initiate a new order of things

Machiavelli

The Pillars of Saudi Energy Policy

The economic development of Saudi Arabia has been unique in many ways as the Kingdom has realized, from the outset of its oil boom starting in the 1960s, that there is a trade-off between the immediate needs of fast economic and social development and the necessity of taking a long-term conceptual framework of planning for a sustained path of future growth, one that is not held hostage to the vagaries of international oil price movements. This dilemma has been acknowledged earlier by those at the helm of Saudi energy policy (Nazer 1991), who argued that economic development for Saudi Arabia was a function of capital accumulation, but that capital by itself carried no magic wand by which the role of scarcity in human society can be abolished, and that while the Kingdom had the “techniques” of modern industrial/energy production, technology and manpower were scarce.

Despite fossil “peak-demand” warnings and climate change carbon emission targets that in theory should be driving Saudi energy policy to maximize current production and revenue generation, Saudi energy policy has remained relatively cohesive along the following energy policy pillars:

- *A long-term view whereby the Kingdom believes it will still be producing oil when many other global fields have gone dry.*
- *Short-term price volatility in the market is to be expected, and Saudi Arabia has to be flexible and efficient enough to meet them and thus maintain spare capacity to do so.*
- *The Kingdom's oil sector had to be overhauled and restructured to meet future global demand for refined products, with international joint ventures playing a key role.*
- *A stable oil market price is essential which would assure a reasonable return to the producer and predictability to the consumer, in essence “reciprocal security” for buyers and sellers of oil.*

- *Act as the major “swing producer” when needed, by moderating its production in an effort to keep prices at a level which provides a reasonable return to producers.*
- *Facilitating cooperation between OPEC and non-OPEC producers in order to stabilize oil markets, as the Kingdom has learned it could not shoulder by itself the burden of stabilizing oil markets and contain oil price volatility.*
- *The promotion of genuine integration in the global oil industry whereby “reciprocal security” is established, especially in the downstream energy sector.*

While some of these “policy pillars” have withstood the test of time, others are recent, especially the advent of shale oil production by a multitude of non-state actors that is promising to change the oil order (Ramady and Mahdi 2015; Jadwa Investment 2017a; Obaid 2001). At the same time, internal Saudi economic dynamics and pressure have necessitated a rethink or “rebooting” of the policy pillars to take into account new strategic directions. After a surge in prosperity over the past decade, especially 2003–2013 fueled by rising oil prices, the Saudi Arabian economy was at an inflection point. By 2016 it was at crossroads in its history when low oil prices over the period 2014–2016 created a real opportunity for the country to inject a new dynamism and new strategy. The challenges ahead are significant, and the remedies somewhat painful, especially for many segments of Saudi society accustomed to generous government handouts and subsidies. Many skeptics argue that Saudi Arabia will not be able to meet all these transformational changes, but the Kingdom has shown resilience in the face of seeming insurmountable odds to manage change, as well as the resolve of the new Saudi leadership to finally try to diversify the country away from oil. They recognize that the simple equation below which has underpinned Saudi economic development since the Kingdom’s establishment is no longer viable:

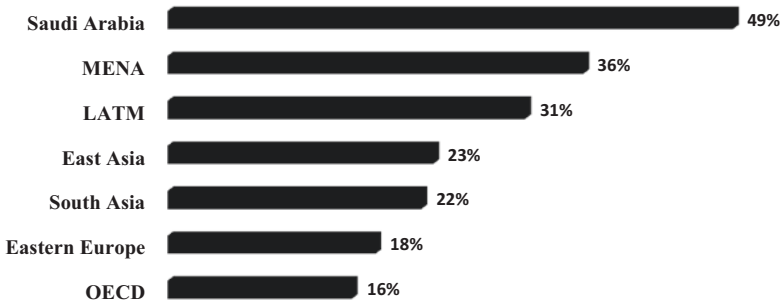
- *Oil revenue – expenditure = surplus (or deficit)*

In essence, the transformation plan can be summarized by another equation.

- *Oil revenues + non-oil revenue + targeted project savings – expenditure + subsidy rationalization = zero surplus*

The new development strategy will heavily rely on the private sector to take the lead initiative, but criticism of a lack of such a private sector initiative can be equally shared between the government and the private sector. By being the primary agent of development change and oil revenue-based fiscal stimulus, the government has not allowed the private sector to fully stand on its feet and compete on a level playing field, both domestically and internationally, with minimal taxation and subsidies to the private sector. This distorted the labor market, with heavy reliance on cheap foreign labor and a preference for public sector jobs by Saudi citizens, resulting in almost half of the total annual expenditure by the government being spent on salaries, wages, and allowances. This is illustrated below indicating a much larger average Saudi spend compared with other global regions (Fig. 3.1).

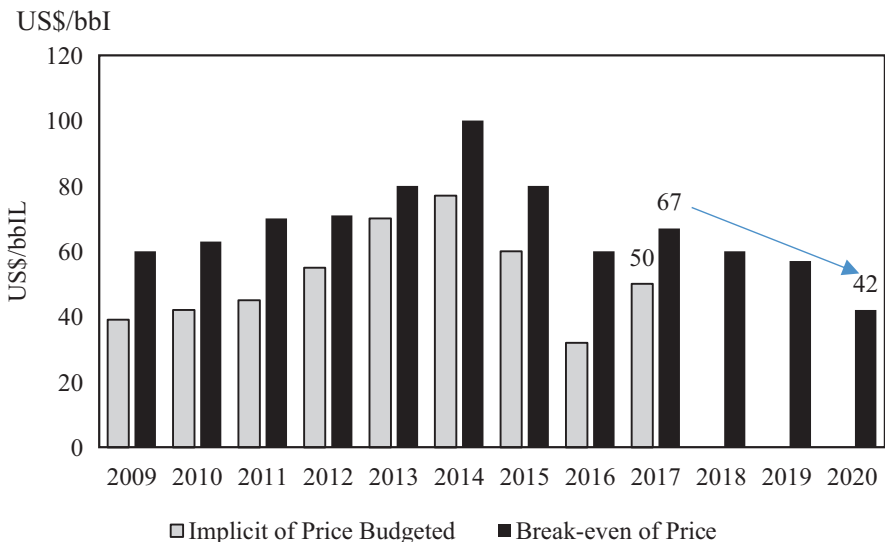
Fig. 3.1 Central govt. wage bill as a % of total expenditure



Source: Baddock, E, Lang P, and Srivastava, V. “Size of Public Sector Government wage bill and employment”. World Bank, Data Set, 17 Feb 2016

Such policy incongruences and frustration on both sides have created friction in the pace and urgency for meaningful reforms and something had to give way. That something was the recognition and urgency from within the Saudi government for a fundamental structural need to diversify the Kingdom away from oil and become the embodiment of the Vision 2030 mission and its National Transformation Program (NTP) 2020 as the medium-term milestone for measuring success. The prize was unambiguous: to ensure a greater independence from oil which can put the Kingdom in a stronger negotiating position in the changing fortunes of global oil markets and shifting energy demand mix, with Saudi Aramco playing a key role in this strategic shift. The added prize is that the Kingdom will be less inclined to act as the main swing producer whether as part of an OPEC or non-OPEC agreement, as such reforms would reduce its fiscal break-even oil price level from around \$70 pb to around \$40 pb as illustrated in Fig. 3.2.

Fig. 3.2 Fundamental reforms would lower Saudi budget break-even oil prices by 2020



Source: Vision 2030, JP Morgan Cazenove (2017)

To achieve the above, someone has to have the necessary vision, drive, and will-power to see the changes through. For Saudi Arabia, a new generation of leaders have emerged willing to assume this responsibility.

Saudi Arabia Under New Management: Key Players and Institutions

For aspiring and visionary leaders, there is no simple blueprint that can precisely guide them on the multifaceted complexities of transforming a nation. For the countries of the Gulf Cooperation Council, the events of the 2011 “Arab Spring” and heightened social and political aspirations have propelled a new generation from among the ruling families to shoulder this responsibility, starting with Qatar, where the Amir Sh. Hamad Al Thani transferred the country’s destiny to his son Sh. Tamim bin Hamad (Ramady 2014). This peaceful transition of power, unlike the convulsions witnessed in many Arab countries, sent a powerful signal for generational changes to be made, with younger ruling family members put in charge of economic and structural transformations, the results of which will only be witnessed in their own lifetime. In Saudi Arabia, 2015 witnessed the remarkable rise of a new generation of grandchildren of the Kingdom’s founder King Abdul-Aziz Al Saud, following the death of King Abdullah bin Abdulaziz in January 2015. Two key players emerged to steer the future direction and destiny of the Kingdom: Prince Mohammed bin Nayef as Crown Prince, entrusted with domestic security affairs, and Prince Mohammed bin Salman bin Abdul-Aziz, King Salman’s son, who as Deputy Crown Prince, was entrusted with the economic transformation of Saudi Arabia.

In June 2017, King Salman relieved Crown Prince Mohammed bin Nayef from his post and named his son Prince Mohammed bin Salman as Crown Prince, with the move supported by 31 out of 34 members of the Allegiance Council made up of senior members of the Al Saud Ruling Family (Sabah et al. 2017; Arab News 2017a). The King’s decision to elevate his son, who already controlled the defense, oil, and economy portfolios, gave the new Crown Prince greater authority to pursue his transformational plans to reduce the Kingdom’s reliance on oil and pursue his Vision 2030 plans. It was a generational transfer of power, the likes of which Saudi Arabia had never witnessed, bypassing the aging sons of King Abdul-Aziz who traditionally were appointed Kings. The deaths of two older Crown Princes in quick succession, Prince Sultan bin Abdulaziz in 2011 and Prince Nayef bin Abdul Aziz in 2012, made the decision to skip one generation and appoint grandchildren of King Abdul-Aziz more readily acceptable to ensure peaceful transition and political stability (Ramady 2014).

Crown Prince Mohammed bin Salman, or MbS as he is popularly known to international observers, felt from the outset that the Kingdom could no longer continue along the old economic model of boom and bust, a hostage to international oil prices and a looming loss in market share to the new global fossil fuel shale swing producers who were operating on pure economic self-interest and not bound by traditional

producer agreements (Ramady and Mahdi 2015). Attitudes in how the economy was being managed; the Kingdom’s relationships, not only with its own private sector but also attracting foreign investors; and how key government-related entities such as Saudi Aramco operated to ensure more innovation and better governance became the new benchmarks. A tight, hands-on “top-down” management of the Saudi economy was initiated whose final aim was to instill a new culture of transparency, accountability, and consistency to reduce business uncertainty for Saudis and foreigners alike. Such ambitious transformational objectives embody both short- and long-term strategies. The art of leadership is to maintain enthusiasm and belief that they are realistic and achievable, for, as Machiavelli’s apt words at the beginning of this chapter reminds us that nothing is more dangerous to handle than to initiate a new order of things, only to see them abandoned later on.

Setting and prioritizing a transformation agenda bring clarity to enable delegation of responsibility and establish accountability. Table 3.1 summarizes some of the key agenda pillars faced by Saudi Arabia today, with those most relevant to Saudi Aramco highlighted.

Table 3.1 Saudi Arabia transformational change agenda and Aramco applicability

Labor market reforms to create an active and productive private sector workforce	Economic reforms to enable private sector growth	A new model of fiscal management to ensure future prosperity
<ul style="list-style-type: none"> • Encouraging increased labor participation, especially for women and youth^a • Raising skills of Saudi workers through education and training^a • Increasing labor market flexibility and mobility for foreign workers and Saudis • Limiting growth in the public sector workforce • Increasing cost of hiring foreign 	<ul style="list-style-type: none"> • Continuing to improve the business environment^a • Removing limits to competition in the private sector • Improving infrastructure required for an efficient private sector • Incentivizing companies to adopt more investment-intensive business models (e.g., talent development, capital intensification, R&D)^a • Professionalizing management practices, including in state-owned enterprises^a • Attracting foreign direct investment and local private investment^a • Increasing local content and localization quotas^a 	<ul style="list-style-type: none"> • Capturing procurement and capital expenditure saving opportunities in government expenditure • Reforming energy market prices^a • Improving returns from state-owned assets^a • Increasing non-oil revenues^a • Maintaining high levels of government investment initially with gradual reduction in government share of investment overtime

Source: Adapted from McKinsey and Company (2015)

^aNote: Applicable to Saudi Aramco

Faced by falling oil prices following the April 2016 collapse of the so-called Doha OPEC-non-OPEC “production freeze” discussion due to mounting Saudi-Iranian geopolitical animosity and lack of trust by all parties that a nonbinding freeze agreement would actually work (Reuters 2016), the Deputy Crown Prince decided to

embark on bold public relations and media offensive to explain his new transformation plans (Waldman 2016). In wide-ranging interviews, Prince Mohammed bin Salman announced the impending introduction of the National Transformation Program under which there would be a comprehensive number of action programs, that the Public Investment Fund (PIF) will assume a greater role in managing both current and future government assets domestically and internationally, and introduced the idea of an Aramco IPO for the first time as a tool to diversify the Kingdom's income and transform Aramco from an oil and gas company to an energy/industrial corporation. During these interviews, the Prince reiterated that generating non-oil income was a priority, with the Kingdom expecting this to reach \$100 bn by 2020, and that fees and value-added taxes (VAT) would be introduced (Waldman 2016).

Prince Mohammed bin Salman's desire for fundamental reforms had been something that he had been harboring long before the April 2016 Bloomberg interview, and the seed for such reforms was laid out in another extensive interview in January 2016 (The Economist 2016) where he talked about starting a "Thatcherite Revolution" for Saudi Arabia by privatizing many state assets and running others more efficiently and touched upon resulting social change and the new role for Saudi women. The Prince admitted that these reforms would not be easy and quoted the famous Churchillian saying that "opportunities came during crisis" and that "wherever I see the obstacles or crises in the region, I also see opportunities" (The Economist 2016). Seeing an opportunity is one thing. Having the tools and operating mechanism is another, but a broad vision statement had to be articulated to start the process of reform. This was done on 25 April 2016 when the then Deputy Crown Prince set out the key pillars of his long-term goals and expectations for Saudi Arabia's Vision 2030 (Saudi Press Agency 2016a).

According to the Prince, these pillars were:

- *First, the status of Saudi Arabia as the heart of the Arab and Islamic worlds*
- *Second, the Kingdom's determination to become a global investment powerhouse*
- *Third, transforming the Kingdom's unique strategic location into a global hub connecting three continents – Asia, Europe, and Africa*

The statement, along with the further interview clarification the next day (Al Arabiya News, 26 April 2016), also set out the following key objectives emanating from the "three pillars":

- *Mineral resource exploitation would also become a priority.*
- *Transforming Aramco from an oil-producing company into a global industrial conglomerate.*
- *Transforming the Public Investment Fund into the world's largest sovereign wealth fund.*
- *Encouraging major Saudi corporations to expand into global markets.*
- *Localize local content, with plans to manufacture half of the Kingdom's military needs within Saudi Arabia.*
- *Adopt wide-ranging transparency and accountability, measures, and reforms and set up a body to measure performance of government agencies and hold them accountable for shortcomings.*
- *Provide better opportunities for partnerships with the private sector through the three pillars.*

Following the official release of the Vision 2030, the government moved quickly to carry out a comprehensive restructuring of the operating government bodies and restructuring of ministries. Through a series of Royal Decrees, the following key changes were implemented, first in May 2016 and then in October 2016. These are set out in Table 3.2.

Table 3.2 Key Saudi ministerial and ministry government body changes, May and October 2016

Ministry/govt. body	Changes	
	<i>Out</i>	<i>In</i>
Ministry of Commerce and Industry (renamed: Ministry of Commerce and Investment)	Dr. Tawfiq Al Rabiah	Dr. Majed Al Qasabi Majed Bawardi, Deputy Minister (Oct 2016)
Ministry of Health	Engr. Khalid Al Falih	Dr. Tawfiq Al Rabiah
Ministry of Petroleum and Mineral Resources (renamed: Ministry of Energy, Industry and Mineral Resources)	Engr. Ali Al Naimi	Engr. Khalid Al Falih HRH Abdelaziz Bin Salman (State Minister) Oct 2016
Ministry of Hajj (renamed: Ministry of Hajj And Umrah)	Dr. Bandar Al Hajjar	Dr. Mohammed Bentin
Ministry of Social Affairs (disbanded)	Dr. Majed Al Qasabi	N/A
Ministry of Transport	Abdulrahman Al Muqbil	Sulaiman Al Hamdan
Saudi Arabian Monetary Agency	Dr. Fahad Al-Mubarak	Ahmad Al Khulaifi
Public Investment Fund	N/A	CEO and Advisor at the General Secretariat of Council of Ministers (Minister rank). Yasser Al Rumayyan
Ministry of Water and Electricity (canceled)	N/A	N/A
Ministry of Agriculture (renamed: Ministry of Environment, Water and Agriculture)	No change: Abdulrahman Al Fadli	Abdulrahman Abdelmohsen Al Fadli
Ministry of Labor. After integration of Ministry of Labor and Ministry of Social Affairs (renamed: <i>Ministry of Labor and Social Development</i>)	Mufrej Al Haqbani (April 2015–Dec. 2016)	Ali bin Nasser Al Ghafis (appointed 3 December 2016)
Ministry of Economy and Planning	Minister, no change: Adel Faqieh (appointed April 2015)	Mohammed Al Twaijri – Deputy Minister appointed
General Authority for Entertainment (New)	N/A	Ahmed bin Aqeel Al Khatib
General Authority for Culture (New)	N/A, chaired by Minister of Culture and Information	Adel Al Toraiifi (out Oct 2016) Dr Awwad Al Awwad (in Oct 2016)
Ministry of Information and Culture	N/A	Adel Al Toraiifi (in office since Jan. 2015, out Oct 2016)

Source: Saudi Press Agency, 7 May 2016b, and 30 October 2016

Besides the above ministerial changes, other key administrative responsibilities were made in May 2016, with former SAMA Governor and Minister of Economy and Planning Dr. Mohammed Al Jasser appointed to the post of Chairman of the Council of Competition and Chairman of the Board of Directors of the Electricity and Cogeneration Regulatory Authority, both key institutions in the planned public-private sector partnership and electricity reforms. In October 2016, long-serving Minister of Finance Dr. Ibrahim Al Assaf was replaced by Dr. Mohammed Al Jad'aan and the Minister of Telecommunications and IT Dr. Mohammed Al Suwaiyel with Abdullah Al Sawaha. The revamped Ministry of Commerce and Trade signaled the importance of international trade opportunities as envisioned in the third pillar of the Vision 2030. The cancelation of the Ministry of Water and Electricity had water added to the renamed Ministry of Environment, Water and Agriculture, and electricity added to the new Energy Ministry signaled some urgency to optimize on water resources, but the most eye-catching change was the transformation of the Ministry of Petroleum and Mineral Resources to the Ministry of Energy, Industry and Mineral Resources. These three sectors constitute the main pillars of the Saudi economy, and their integration and coordination will affect how the Saudi economy truly diversifies in the decades to come.

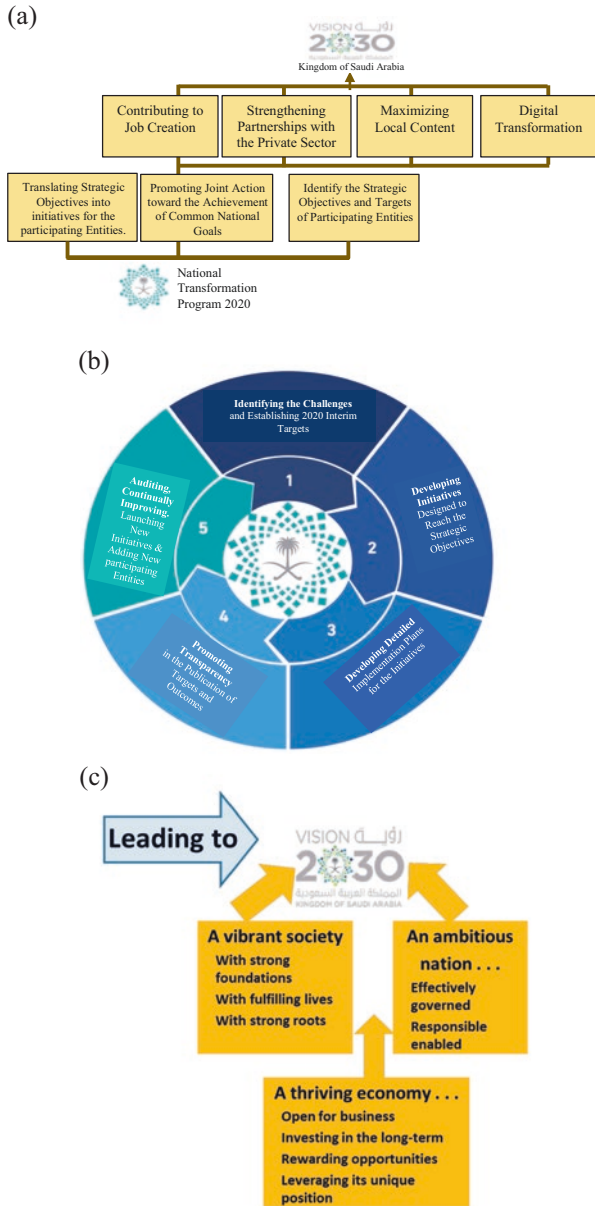
Other changes were the establishment of new bodies such as the General Authority for Entertainment and the General Authority for Culture, areas which the young Deputy Crown Prince believes are just as important for Saudi society to develop their talent and have an opportunity to enjoy themselves within the Kingdom, without compromising on accepted social customs and norms. As the Vision 2030 stated, the Kingdom considers culture and entertainment indispensable to the quality of life and is well aware that the cultural and entertainment opportunities currently available do not reflect the rising aspirations of citizens and residents, nor are they in harmony with the Kingdom's prosperous economy. Another significant change was the rebranding of the Ministry of Commerce and Industry into the Ministry of Commerce and Investments, with the relevant Minister chairing the Board of Directors of institutions important to both foreign direct investment, such as the Saudi General Authority for Investment (SAGIA), and those important to spur indigenous economic growth such as the Small and Medium Enterprises and the Saudi Standards, Metrology and Quality Organization.

Ensuring that future generation of Saudis are equipped with modern education and vocational skills, a Royal Decree appointed another well thought of technocrat, Dr. Musaad Al Aiban, Minister of State, to the post of Chairman of the Education Evaluation Commission. This was a bold move from traditional education oversight and brought under the new commission's remit the National Commission for Academic Accreditation, the Technical and Vocational Accreditation and Assessment Centre, and the evaluation of public and higher education at the Ministry of Education. In order to ensure that the private sector could rely on a skilled and modern-oriented education curriculum, these changes were essential.

The key message from these institutional changes was in tackling bureaucracy, meeting the challenges surrounding the expansion of the private sector, and the

diversification of the economy, all undertaken by a more youthful government team. The National Transformation Program 2020 would be the kickoff for the Vision 2030 roadmap. The overarching objectives are illustrated below.

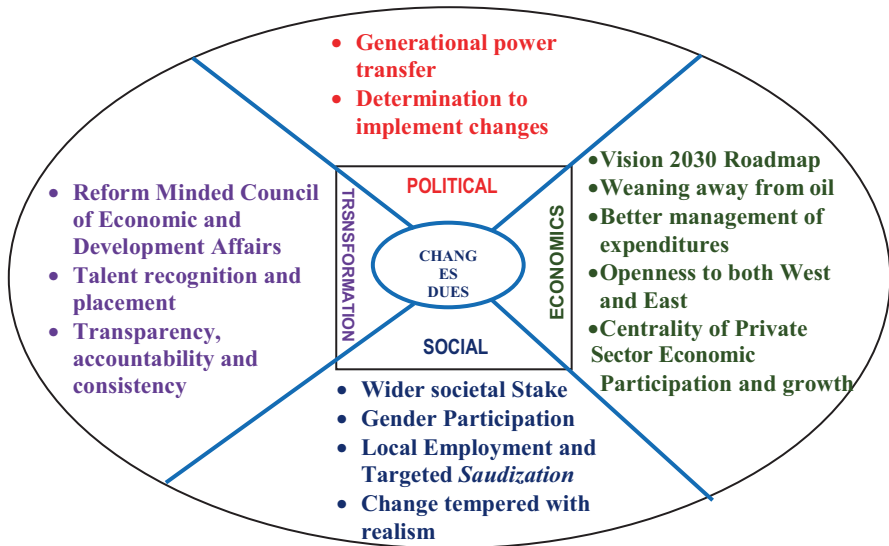
Fig. 3.3 National Transformation Program (NTP) and its operating model. (a) The NTP and Vision 2030. (b) Operating model of the NTP. (c) Saudi Arabia’s Vision 2030



Source: Saudi Arabian Government Official Vision 2030, www.vision2030.gov.sa

The Saudi Council of Ministers approved the National Transformation Program (NTP) 2020 on 6 June 2016 with the program branching out directly from Vision 2030 as illustrated in Fig. 3.3a. The NTP objectives were specific: setting out an operating model that identifies strategic, long-term objectives of key participating government entities, translates these objectives into initiatives, and promotes joint action in achieving common goals (Jadwa Investment 2016b, p. 2). These generational transformation changes have been summarized below using a PEST (political, economic, social, and transformation) snapshot in Fig. 3.4. The implementation challenges faced by the then Deputy Crown Prince and his handpicked team are truly a heavy burden for any reformist-minded government to bear, especially for a country where both the private and public sectors are more accustomed to a “steady as she goes” economic, social, and political path (Ramady 2010).

Fig. 3.4 Saudi Arabia Vision 2030: A PEST assessment



The enormity of the transformation task has forced the Saudi government to redo its NTP 2020 plan to overhaul the government bureaucracy and economy, and according to media reports, the new version of the National Transformation Program will be “more focused” and have “clear governance” and was referred to as NTP 2.0, with the overall aim to match it with the broader Vision 2030, as some felt that the NTP and the Vision were not developed in complete coordination (Nereim 2017).

New Ministry: New Tasks for Aramco

As noted earlier, one of the eye-catching ministerial changes and functional changes involved the Ministry of Petroleum and Minerals which was rebranded as the Ministry of Energy, Industry and Mineral Resources under Engr. Khaled Al Falih, who also became the Chairman of Saudi Aramco, thus providing continuity and guidance to that organization given his many years with Saudi Aramco, the last as Aramco's CEO. Besides his Aramco role, the Minister became Chairman of the Board of Directors of the Royal Commission for *Jubail and Yanbu*, Saudi Arabia's mega industrial hubs, as well as the Saudi Industrial Development Fund (SIDF). Added to his portfolio were chairmanships of the organization for Industrial Estates and Technology Zones, the Saudi Geological Survey, the King Abdul-Aziz City for Science and Technology (KACST), the Saudi Exports Development Authority, and King Abdullah City for Atomic and Renewable Energy (KA-CARE) (Saudi Press Agency 2016a).

Besides the above responsibilities, the Minister was also appointed as Chairman of the Saudi Arabian Mining Company (Ma'aden) in April 2016 (Ma'aden 2016), and Mr. Falih is also an active participant in many social programs and served as Chairman of the Dammam City Municipal Council, the Prince Sultan bin Abdul-Aziz Fund for Supporting Small Business Projects for Women, and the Eastern Province Society for the Handicapped. The Minister is also an active participant in the Kingdom's leading universities, being a Board Trustee of the King Abdullah University of Science and Technology (KAUST), a former member of the International Supervisory Board of King Fahd University of Petroleum and Minerals (KFUPM), as well as an International Council Member of JPMorgan Chase.

This is a tall order for any one individual to assume, but it speaks volumes on the perceived technical and organizational abilities of Mr. Khaled Al Falih, as well as putting all the key levers of mining, industrial, energy, and technological sectors under one umbrella to ensure smoother coordination and avoid duplication and waste in resources and scarce human talent. What then are the new goals of this "super ministry"?

The diversification away from crude oil dependency is underlined in the Ministry's first strategic objective which states that the value of exports of non-oil commodities is targeted to rise from SR185 bn (\$49.3 bn) to SR 330 bn (\$ 88 bn) by 2020, with a major added element coming from the mining sector, whose contribution to GDP will rise from SR 64 bn (\$17.0 bn) to SR 97 bn (\$25.9 bn). The minerals and metallic wealth present a major opportunity for the Kingdom to develop additional resource and manufacturing sectors based upon minerals that would assist private sector growth and value-added new job creation, whereby according to the NTP, the mining sector would employ a total of 90,000 people by 2020 (Saudi Arabian Government, Vision 2030, 2016a). Due to the rural location of most mining operations, the potential for job creation outside the major Saudi cities could assist in regional economic development, and the government has gone a long way in changing the mining and concession laws to attract foreign participation (Ramady 2010). Other key NTP 2020 strategic objectives of the Ministry of Energy, Industry and Mineral Resources are set out in the Table 3.3.

Table 3.3 Key objectives of the Ministry of Energy, Industry and Mineral Resources

Objective	Baseline 2016	Target 2020	Aramco involvement
• Efficient utilization of fuel in electricity power generation	33%	40%	(*)
• Percentage of local content in total expenditure of public and private sectors	36%	50%	(*)
• Percentage of jobs localization in the private sector	19%	24%	(*)
• Percentage of power plant electricity generation through strategic partners	27%	100%	(*)
• Petroleum production capacity	12.5 mbpd	12.5 mbpd	
• Dry gas production capacity	12 billion standard cubic feet per day	17.8 billion standard cubic feet per day	(*)
• Refining capacity	2.9 mbpd	3.3 mbpd	(*)
• Percentage of reduction in CO ₂ emission in KSA	28 billion standard cubic feet per day	26 billion standard cubic feet per day	(*)

Source: NTP 2020, Vision 2030, Official website – www.vision2030.gov.sa

As noted from the above list of key objectives, Aramco has a significant role to play in their implementation, which will be addressed further in the next section, especially for Aramco's novel In-Kingdom Total Value Add (IKTVA) localization program, and expansion of its downstream refining and petrochemical supply chain. The Kingdom's relatively cheap energy and gas feedstock give it a competitive advantage for mining sector exploitation, especially in aluminum and phosphate.

Saudi Aramco and Vision 2030

Aramco's senior management have embraced the company's role under the Vision 2030 plan with enthusiasm, exemplified by the following statements:

- *Chairman Khalid Al Falih*: "Saudi vision 2030 is a pioneering and game-changing plan that will enable sustained economic growth, diversification and job creation to benefit the kingdom and its citizens for generations to come."
- *CEO Amin Nasser*: "It is important to remember that even in a period of far-reaching change, some things remain constant: the dedication of our people, the commitment and capabilities of our organization and the can-do spirit that has always been present in Saudi Aramco... We are very excited about the prospect of a potential IPO which will give us the opportunity to deepen our engagement and value-creation impact in the economic transformation of Saudi Arabia, and further showcase Saudi Aramco's excellence locally and globally."

(Saudi Aramco, April 2016, Arabian Sun)

Given that other key senior Aramco officials will be involved in taking the Vision 2030 forward, it is important to learn how they also feel the company will achieve its goals, as a critical element of success or failure will be their individual and collective responsibility. Besides the Aramco Chairman and the CEO, other key Aramco officers responsible for Vision 2030 implementation include the following:

1. *Abdulrahman Al Wuhaib, SVP, Downstream Operations*: “Some of Saudi Aramco’s most significant achievements in recent years have been in developing new international and domestic partnerships in the downstream space. Alongside the expansion of the Public Investment Fund, I believe that Saudi Vision 2030 and the National Transformation Program can deliver further opportunities to help us consolidate those downstream relationships still further.”
2. *Dr. Mohammed Al Qahtani, SVP Upstream Operations*: “We have the world’s highest quality of reserves and product grade quality, we are the world’s lowest cost producer, and our recovery rates are among the highest in the world. In addition, our upstream research and development is focused on increasing recovery from existing assets and optimizing reservoir management, striving to replace 100 percent of produced oil with new reserves and growing reserves annually.”
3. *Dr. Muhammad Al Saggaf, SVP Operations and Business Services*: “Lowering the national rate of unemployment from 11 percent to 7 percent by 2030 is a challenging but achievable goal. Enhancing national education levels, embedding skills for the knowledge economy, and increasing women’s participation in the workforce are all critical to helping achieving it.”
4. *Ahmad Al Sa’adi, SVP Technical Services*: “Saudi vision 2030 calls for an accelerated and broad diversification of the economy, driven by entrepreneurship, technological innovation and targeted investment. Saudi Aramco’s In Kingdom Total Value Add Localization Program is one example of how this vision is being put into practice today, by promoting the development of localized energy sector businesses so that the company and the Kingdom benefit from a cost competitive local supply chain and the creation of new high quality jobs for Saudis. This is a model that I believe can be expanded upon and extended nationally across many industrial sectors.”
5. *Abdullah Al Saadan, SVP, Finance, Strategy and Development*: “The listing of Saudi Aramco and other privatizations will increase investor confidence in the local stock market and boost foreign direct investment, market stability and overall growth. This will be good for the country, for Saudi Aramco and its customers, partners and suppliers.”
6. *Nabeel Al Mansour, General Counsel*: “The prospects of an initial Public Offering of Saudi Aramco will elevate the international visibility of an strategic decision-making and accountability practices. This will promote a greater understanding of Saudi Aramco’s business capabilities and increase confidence in our long-term strategic orientation and governances and thus be a positive development for the company.”

(Saudi Aramco, 27 April 2016, *Arabian Sun*)

From the above Aramco statements of intent, a SWOT analysis can be deduced and set out in Table 3.4.

Table 3.4 Aramco SWOT analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong oil/gas reserve • Significant production capacity • Focus on innovation, research, and development • Growing refining assets • Global market position 	<ul style="list-style-type: none"> • Concentration of reserves in the Kingdom • Lack of worldwide retailing network • Ambitious Vision 2030 mandate/execution capacity • Overstretched key personnel
Opportunities	Threats
<ul style="list-style-type: none"> • Energy efficiency initiatives • Expand localization supply chain base • Expand the current business operating model into manufacturing • Potential IPO creating new operating structure 	<ul style="list-style-type: none"> • Fluctuating prices of crude oil, natural gas, and chemicals • Facing more stringent environmental regulations • Intense competition internationally with IOCs • IPO does not deliver hoped-for changes

Strengths

Aramco's key strengths include holding significant oil and gas reserves, which will drive the growth of the company in the coming years, aided by the highest oil production capacity of 12.5 mbpd among oil-producing nations. A strong focus on innovation and research and development has been the hallmark of Aramco over recent years, with substantial progress in its global R&D program; dedicated Aramco research centers in Europe, the USA, and Asia; as well as association with leading universities in Saudi Arabia and abroad, such as MIT, Georgia Institute of Technology, KAUST, KFUPM, and the Korean Advanced Institute of Science and Technology, especially in carbon capture and corrosion to fuel products. The company has also been active in promoting, patenting, and applying in-house patents. Other strengths include a growing domestic and international refining asset portfolio, with joint ventures in South Korea, Japan, and China, and the company's global market position has been boosted with new joint venture agreements in Malaysian and Indonesian refinery and petrochemical ventures following on from King Salman's Asia tour in March 2017.

Weaknesses

Despite studies to launch its own retailing outlets in Saudi Arabia, Aramco does not have either a domestic or global network of retail stations that integrated international oil companies like Shell, BP, or Exxon. Possessing such a retail distribution

network provides Aramco with assured demand for its oil exports. The concentration of oil reserves in Saudi Arabia is primarily based on two oil fields, *Ghawar and Safaniya*, despite new fields offshore and onshore in *Shaybah*. Concentrating production in these major fields increases business risk in case of technical disruption. The new mandate and tasks pertaining to Aramco under the Vision 2030 are ambitious with a relatively short time span for implementing the NTP 2020 objectives set out earlier in Table 3.3. This raises questions on whether Aramco, in its current organizational and staffing structure, can efficiently cope with the new mandate without overstretching key personnel.

Opportunities

Aramco's energy efficiency programs such as reducing carbon monoxide (CO₂) emissions, creating next-generation materials that make lighter and stronger consumer products, and conserving water resources are part of its strategic intent, leading to 2% annual reduction energy intensity in industrial facilities. This will result in a savings of around 150,000 barrels per day of oil equivalent such as cogeneration and process enhancements. Aramco has taken the lead in implementing a local content and localization in its contract awards, creating opportunities for Saudi companies to become effective partners in the supply chain process. Other opportunities that Aramco faces are expanding its operating business model into engineering manufacturing and services, with the planned IPO creating a new corporate governance model between the company and external shareholders.

Threats

Uncertain crude oil prices affecting gas and chemical feedstock are external threats that Aramco will continue to face until it consolidates its refining and petrochemical supply chain, but in a low oil and gas price environment, Aramco's revenue stream will diminish, making some long-term capital expansion projects less profitable. Companies operating in the oil industry are also subject to strict environmental regulations, which are subject to change. Aramco faces competition from international oil companies in foreign countries, as they also try to expand their refinery and downstream integration chain, with mergers of such international oil companies giving them a competitive edge in sourcing financing. A major threat is that the planned IPO does not deliver the hoped-for corporate governance, transparency, and oversight and that a post-privatized Aramco is still behest to Saudi government production targets and other politically driven objectives.

Poverty Amid Plenty: Tackling the Subsidies Program

According to the United Nation's special rapporteur on extreme poverty and human rights, Professor Philip Alston, the Kingdom's "Vision 2030, the National Transformation Program 2020, and the fiscal balance program, all reflect an ambitious and deeply transformative agenda, driven by a combination of economic necessity, social evolution and bold political leadership" (United Nations 2017, End of Mission Statement, p. 1). The UN's fact-finding mission had been expected with Saudi officials welcoming it to assess how to alleviate poverty in the Kingdom (Arab News 2016a). The special rapporteur's end of mission statement makes for somber reading considering that many Saudis are "convinced that their country is free of poverty. .. that there are no homeless and no hungry people, and that the innate spirit of generosity within the society ensures there is no poverty" (United Nations, *ibid.*, p. 2).

Despite the launch of a National Poverty Reduction Program in 2005 and a Supplementary Support Program in 2016, according to the special rapporteur, "the result is a veritable hodgepodge of programs which is inefficient, unsustainable, poorly coordinated, and above all, unsuccessful in providing comprehensive social protection to those most in need" and that some of the resulting challenges are:

- *Lack of a true understanding of the nature of poverty in the Kingdom*
- *Weak targeting, overlaps, and leakage in beneficiary coverage*
- *Weak coordination and fragmentation within and across delivery institutions*
- *Little to no involvement from the private sector* (United Nations, *ibid.*, pp. 2, 3)

The Vision 2030 and the accompanying reforms are aimed at remedying these problems, and how this is done will have a significant impact in tackling the current Saudi energy subsidy program. In the Middle East and North Africa (MENA) region, the IMF has noted that successful subsidy reform requires "thorough preparation, including clear diagnostics and careful planning of the pace and breadth of reform" as crucial factors for successful reform (IMF 2014, p. xi). The government of Saudi Arabia has taken up the challenge, and in December 2016, a "Household Allowance" program was announced in the "Fiscal Balance Program: Balanced Budget 2020" which will provide cash transfers to compensate lower- and middle-income households for the direct (rising consumer prices for energy and water) and indirect (rising retail prices, including for food) negative impact on living costs of the subsidy reforms (Saudi Arabian Government 2016b; Jadwa Investment 2016a). The guiding principles for design of the "Household Allowance" are as follows:

- Provide protection to low-income Saudi family groups against reforms' impact.
- Allowances should be cash based on "sensible" consumption levels (defined as the average consumption of a household of six members who consume 398l of gasoline per month if they have two cars and 2594 kw electricity per month).
- Allowances should be fair and vary for different household's composition.
- First payment should be made before implementing any more reforms that will impact households.

Those eligible for monthly allowances were segmented into five income brackets, ranging from an average monthly income of under SR 8699 for the first category and over SR 20,160 per month for the fifth category with this category not receiving a monthly allowance as illustrated in Table 3.5a and 3.5b, which sets out the impact on family categories for 2017 and by 2020.

Table 3.5a Estimated burden and average allowance amount in 2017 for a family of 6

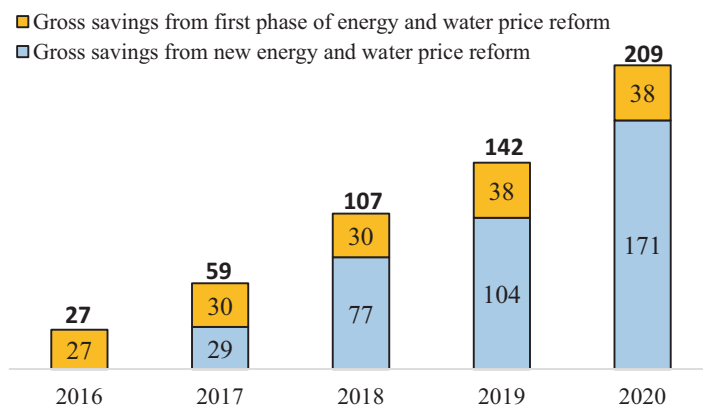
	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Average income (SAR month)	0–8699 4500	8700–11,999 8500	12,000–15,299 12,500	15,300–20,159 17,500	20,160+ 34,500
Estimated extra burden (SAR month)	(1000)	(1100)	(1300)	(1500)	(2000)
Average allowance (SAR month)	1200	1200	1000	600	0
Net burden or allowance (SAR month)	200	100	(300)	(900)	(2000)

Table 3.5b Estimated burden and average allowance amount in 2020 for a family of 6

	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Average income (SAR month)	0–8699 4500	8700–11,999 8500	12,000–15,299 12,500	15,300–20,159 17,500	20,160+ 34,500
Estimated extra burden (SAR month)	(1300)	(1600)	(1900)	(2200)	(3100)
Average allowance (SAR month)	2000	2000	1500	1000	0
Net burden or allowance (SAR month)	700	400	(400)	(1200)	(3100)

Source: Balanced Budget 2020, p. 64. www.vision2030.gov.sa

Table 3.5a illustrates the estimated extra burden per month, the size of the average allowance, and the net burden or allowance for each of the family income bands. For both 2017 and by 2020, the first two family low-income households or those under SR 11,999 per month will end up with a net credit allowance. According to the Fiscal Balance Program, by 2020, the subsidy reform is expected to save SR 209 bn per year (\$55.7 bn), while the Household Allowance payments will cost SR 60–70 bn (\$16 bn–\$ 18.7 bn), a saving of as much as two-thirds. The savings are illustrated in Fig. 3.5, showing how the savings in billions of SR would come from both new and first phase of energy and water price reform.

Fig. 3.5 Gross savings from energy and water price reforms (2016–2020)

Source: Fiscal Balance Program: Balanced Budget 2020, p. 44

Like any new program, the announcement of the government's Family Allowance account created some public confusion, and clarifications followed, whereby Saudi Energy Minister Falih denied that energy subsidies will be lifted immediately, but only after the unified citizen account comes into effect by July 2017 and only after the subsidy reimbursement is deposited into citizen's account (Arab News 2016b). A further clarification by Finance Minister Mohammed Al Ja'adan was made, advising that the new citizen's account program will be directly linked to changes in energy prices, whereby if energy and fuel prices decline, then subsidies will be reduced (Al Riyadh Newspaper 2017).

By March 2017, according to a government spokesman, more than 3 million Saudi families – some 11 million citizens – had registered in the citizen's account program (Bloomberg 2017). This represented around 38% of a total Saudi population of 28.8 million. While the spokesman did not give a detailed breakdown of how many families fell into the low- and medium-income groups (under SR 8699 and those earning between SR 8700 and 11,999), as these were the primary family groups benefitting from the citizen's account, the number of those registering indicated that there indeed existed a Saudi poverty trap which the government has to take into account when contemplating further price reforms. The decision by the Kuwaiti parliament to revoke in February 2017 the September 2016 hikes in fuel and energy prices has not gone unnoticed by other Gulf states, making it an issue which has to be approached carefully (Argaam 2017a).

While the effect of rising energy and water prices will be mitigated for some of the low- to middle-income households through allowances, the government's Fiscal Balance Program (FBP) noted that some segments of Saudi industry would be given targeted support to help them adapt to the planned energy price reforms. The key principles outlined include:

- *Support heavily impacted strategic industries/sectors with high Saudi employment or contribution to GDP.*

- *Redirect some of the reform savings toward emerging industry priorities.*
- *Increase prices gradually to allow impacted industries to adapt.*

Saudi Arabia has selected the domestic petrochemical industry for concentrated support and highlighted this in the Vision 2030 plan to ensure that this sector maintains and gains market share in both the regional and international markets. This is the reason why, as Table 3.6 illustrates, the government is delaying the rise in price of natural gas, butane, and propane to selected industries until 2020.

Table 3.6 The 2020 roadmap for price reform

Year	Households	Industry
2017	Link electricity 100% to reference prices	
2018		Link electricity 100% to reference prices
2019	Based on the readiness of the water infrastructure, gradually link water prices to reach reference prices	
		Gradually link all unpegged products to reach reference prices (except for butane, propane, and natural gas)
2020	Bring all products to reach 100 of reference prices	

Source: Fiscal Balance Program: Balanced Budget 2020. p. 41

The main phase of price reform will involve a steady change in prices, over the period 2017–2020 as illustrated in Table 3.6, with domestic prices linked as a percentage to the reference export price of the respective product and will fluctuate according to fluctuations in the international market and revised periodically based on increasing the percentage linkage with the international market prices. The delay in the rise of prices to industry is due to the challenges faced by the Saudi petrochemical sector, which was explored more fully in a previous chapter.

Fixing the Imbalance: The Energy Efficiency Program

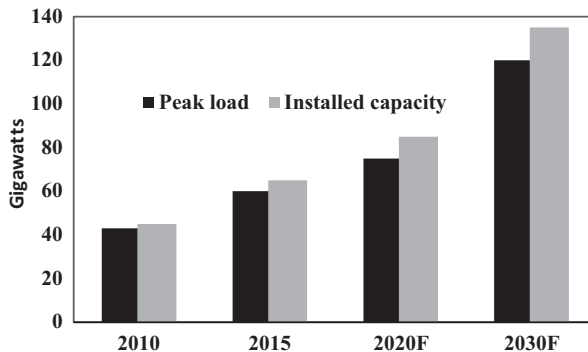
The Saudi government has recognized that it cannot indefinitely provide energy products to its domestic consumers at differentiated and discounted prices to international export prices, resulting in an opportunity costs of lost revenues. The Fiscal Balance Program has estimated that the Kingdom’s energy benefits reached around SR 300 bn (\$ 80 bn) in 2015, with water and energy typically accounting for the vast majority, around 80% (Fiscal Balance Program, p. 36). Reforming subsidies, as noted earlier, is one aspect, but undertaking a comprehensive energy efficiency program could also yield significant savings and reduce the fiscal opportunity cost. Until the full subsidy price reforms set in by 2020, the Saudi industrial sector has a

window of opportunity to transform and become willing energy-efficient users and globally competitive. The government has established industrial support objectives, not only to assist industries of strategic importance as noted earlier but also on industries which were ranked according to the impact of price reform on their very survivability, thus impacting jobs and creating opposition to price reforms (Atalla et al. 2017). The overriding aim was to foster efficiency objectives that were both realistic and achievable and centered around the following four objectives:

- (a) *Ensuring rapid capture of efficiency opportunities (by implementing support and capability building, performance management, and efficiency financing)*
- (b) *Ensuring survival of industries until commodity prices recover (through temporary funding support)*
- (c) *Building enablers for a long-term competitive advantage (by enabling infrastructures)*
- (d) *Promoting an energy and operational efficiency ecosystem (through regulation)*

Efficiency in electricity consumption has become a priority policy objective, and the unsustainability of use of oil in electricity generation has prompted this efficiency drive. Tariff rates were adjusted in 2016, including higher-consuming residential users, resulting in raising the average per kilowatt hour (Kwh) prices by 20%, from 13 halalas (\$0.03) per Kwh to 16 halalas (\$0.043). Low-consuming residential customers were not affected. Saudi energy consumption is forecasted to continue rising due to population growth and expanding industrial development under the National Transformation Program 2020. The Kingdom is expected to add another 25 GW of generation capacity by 2020, bringing installed capacity to 94 GW illustrated in Fig. 3.6, with a forecasted additional installed capacity of 130 GW by 2030.

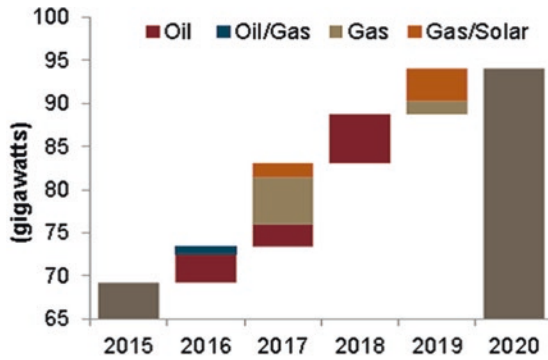
Fig. 3.6 Saudi electricity demands: peak load vs. installed capacity (GW) 2010–2030



Source: Jadwa Investment, October 2016c, p. 7

Maintaining reserve electricity generation capacity is an important government objective, and the NTP 2020 specifically states that such reserve capacity should equal 12% by 2020 to avoid the recurrent electricity peak demand outages faced by major Saudi cities, especially during the summer months. A key question is what type of energy feed-mix will be used to cater for the planned demand growth. Although the Saudi government is actively aiming to reduce oil burning in electricity generation, only 4 of the 13 projects currently planned to come online between now and 2020 are fully gas-fueled power plants, with three additional plants having a mix of gas and solar power, while one plant will be fueled by both oil and gas, but fuel flexibility is stipulated in oil-fired plants with possibility of switching from oil to gas (Jadwa Investment 2016c, p. 8). This is illustrated in Fig. 3.7.

Fig. 3.7 Energy feedstock mix 2015–2020



Source: Jadwa Investment, October 2016c, p. 7

Increasing Saudi gas production, both conventional and unconventional (shale), is central to the Vision 2030 plans, and Aramco is at the forefront of this effort. According to the company, a number of gas projects currently being worked on are expected to push the total gas production to 17.8 bcf/d in 2020, up from 11.6 bcf/d in 2015, the majority being non-associated gas from the *Hasbah-Arabiyah* gas fields, as well as from the *Wasit* and *Fadhili* projects in the *Midyan* field which will become fully operational by end 2016 (Saudi Aramco 2016b). More than two-thirds of the Kingdom’s gas is still derived from the giant *Ghawar* field which yields both associated and non-associated gas and from *Karan*, the Kingdom’s first offshore non-associated gas field, but which hit peak production in 2012, forcing Aramco to explore the abovementioned fields.

Saudi Aramco’s energy efficiency participation has not only been limited to its own production activities, but it has been an active participant in other national initiatives such as the National Energy Efficiency Program (NEEP) launched in 2002 to facilitate the use of energy-efficient technologies, later becoming the Saudi Energy Efficiency Centre (SEEC) working in close coordination with King Abdullah City for Science and Technology (KACST), and through the King Abdullah

City for Atomic and Renewable Energy (KA-CARE) which is focusing on introducing renewables into the electricity generation mix, with KA-CARE setting a renewable energy target of 4% of total energy used by 2020.

The Kingdom renewable program has now been championed by the new Energy Minister Khalid Al Falih, who announced a target investment of between \$30 bn and \$50 bn in a massive renewable program, calling for 10 gigawatts of solar and wind power by 2023 (Hirtenstein 2017). Driven by the Minister, Aramco has also taken its own initiatives, and with a looming IPO, the company is vowing to dramatically expand the use of photovoltaic solar energy to underpin its credibility in embracing environmental and sustainability goals, measures that international institutional investors wish to see companies like Aramco incorporate as part of their environmental, social, and governance factors or ESG. For Aramco, the renewables and ESG programs help to expand the number of investors who could take a piece of the planned IPO (Hirtenstein 2017). In early 2017, Aramco was said to be considering as much as \$5 bn of investments in renewable energy firms and that banks like HSBC, JPMorgan Chase, and Credit Suisse had been invited to help Aramco identify potential acquisition targets (Martin 2017). In April 2017, Saudi Arabia short-listed firms for both solar and wind power projects, with 27 companies qualified for the 300 MW solar project and 24 firms for the 400 MW wind farm, with Minister Falih noting that the short listing represented the first step toward realizing the Kingdom's renewable energy ambitious (Argaam 2017b). According to the Minister, Saudi Arabia will produce 10% of its power from renewables by 2023 and also plans to generate electricity from nuclear plants, with the Kingdom planning to develop almost 10 gigawatts of renewables and spend up to \$50 bn (Mahdi and Nereim 2017).

Some have argued that Aramco should focus on its core energy exploitation and production business to make the planned IPO more attractive; that it would be better for Saudi Arabia if it made clear that efforts to diversify its energy sources and develop new industries like solar power were being done under the aegis of a national policy, rather than Aramco's corporate activities; and that Aramco should not monopolize Saudi Arabia's expertise and technology capability. This argument might hold true if Aramco's interest and involvement in energy efficiency and renewable had only been prompted by a prospective IPO, when, as we had noted earlier, the company has been intimately involved in Saudi Arabia's energy R&D activities as well as its own global research centers prior to any IPO discussion.

IKTVA: Rebooting the Saudi Energy Sector

Governments can play a significant role in driving in-country value add production that enables the success of local industry to gain experience and help in national development and diversification programs. The aim of government local content policies focuses on specifying a certain percentage of projects that must be supplied by local companies. Local content policies and regulations have not often delivered

the expected outcomes, sometimes leading to delays in production from national companies who are not yet accustomed to meeting tight deadlines, increased costs, or a lack of incentive to innovate or reinvest by either local or foreign companies, when one of the aims of localization is to instill such an objective to ensure that long-term costs are kept down.

Over the years, many countries have initiated their own models of localization, with varying degrees of success from the experience of Angola, Norway, Brazil, Mozambique, and Nigeria. The Brazil experience has been mixed, with the country achieving a degree of rapid industrialization, skilled workforce development, and impressive R&D, but at the same time, it has led to significant delays in field development and production, as localization became the sole focus and led to significantly increased costs which delayed the development of oil and gas production and set back needed state revenues. Angola and Mozambique copied Brazil’s model with much similar results, while in the case of Nigeria, the same issues associated with Brazil became evident but has also led to significant corruption from state officials in granting local contracts that further reduced the positive impact that local content policies could have. Norway’s model was a successful one, with companies that want to participate in the Norwegian oil and gas industries required to establish local manufacturing, services, and R&D centers. This was a long-term strategic decision by the Nordic country, and over the past four decades, Norway has created a sustainable export-oriented economy that provides goods and services to the world’s energy sector. Through this experience, Norway established in-country value addition throughout its national procurement and practices. Given such a diverse range of experiences, countries can learn from what has and has not been successful elsewhere, to minimize mistakes and then apply it to their own particular circumstances. Saudi Aramco did just that and the result was the unveiling of its IKTVA (In-Kingdom Total Value Add) program in December 2015 (Saudi Aramco 2017a) (<https://www.iktva.sa>). The aim was very specific; by 2021 achieve the following targets:

- 70% local content.
- Create 500,000 new jobs.
- Add 30% of exports from Saudi-based IKTVA-related companies.

To monitor contractor’s performance, Aramco would use the following assessment metrics:

Supplier IKTVA formula

$$\%IKTVA = \left[\frac{A + B + C + D}{E} \right] \times 100$$

where:

- A = localized goods and services (\$)
- B = salaries paid to Saudis (\$)
- C = training and development of Saudis (\$)
- D = supplier development spend (\$)

Additional information required included (both in Kingdom and in Aramco):

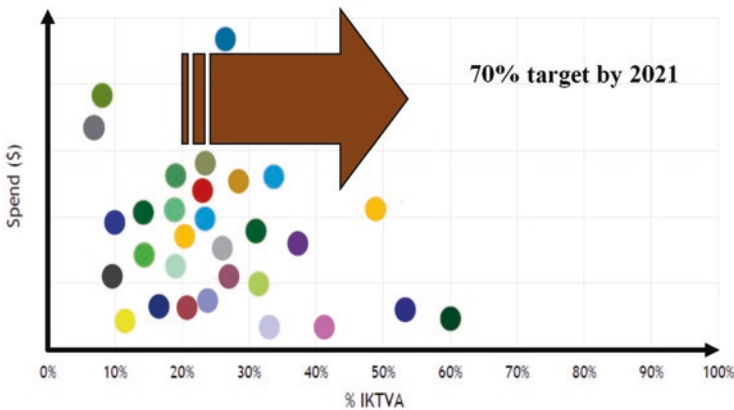
- *Number of Saudi employees*
- *Investments carried (\$)*
- *R&D spends (\$)*
- *Exports (\$)*

By including differentiated contractors' activities in the Kingdom and also for projects with Aramco, the company wanted to obtain a total picture of the foreign contractor's Saudi-based activities, as some contractors had other government- and private sector-related contracts besides those with Aramco.

To ensure transparency and a clear "supplier code of conduct," and to avoid some of the issues faced by other countries' localization efforts, Aramco requires its suppliers and contractors to share its business ethics commitments and has established a supplier code of conduct whereby all registered vendors, manufacturers, contractors, and subcontractors are required to acknowledge and abide by these policies and principles to continue doing business with Aramco. The aim was clear: to ensure that all parties involved in supply chain procurement activities feel confident in the fairness and transparency of the processes involved (<https://www.iktva.sa>).

Aramco's decision to proceed with its IKTVA program was based on the fact that the overall suppliers' localization element was still within the 10–15% level as illustrated in Fig. 3.8.

Fig. 3.8 Aramco suppliers' IKTVA compliance levels, 2015



Source: Saudi Aramco, IKTVA presentation, Dec. 2015. Al-Yami, Nasser, "Creating Value in the Kingdom." p. 9

Figure 3.8 indicates that there seems to be an inverse correlation between companies with higher relative contract spend/awards and IKTVA localization, while companies with lower relative spend and awards seem to be more compliant with localization. The aim of the program is to move the majority of companies, especially those in the relatively high-spend category, toward the desired 70% localization target by 2021.

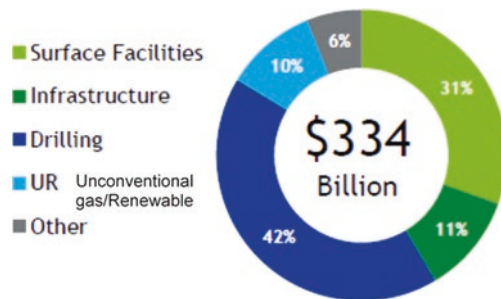
The incentives to comply with Aramco’s localization targets are extensive, and both local and foreign investors are eligible to the following incentives:

- 100% ownership of investment projects in Saudi Arabia
- Maximum rate of 20% on corporate profits over SR 100,000 (\$26,700)
- Repatriation of 95% of their capital, profits, and dividends
- Exemption from custom duties on imports of machinery, equipment, raw materials, and spare parts imported for industrial use
- Eligible for long-term concessionary loans from the Saudi Industrial Development Fund
- Can carry over current tax losses into future years to offset taxes on future profits

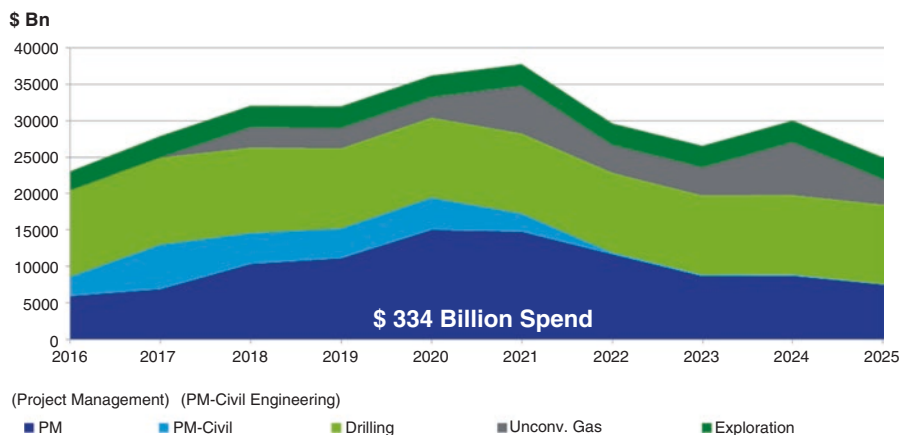
According to former SAMA Governor and Planning and Economy Minister Dr. Mohammed Al Jasser, the goal of local content in Saudi Arabia should be to increase Saudi participation in the labor force without sacrificing efficiency or quality, and if implemented properly, this can create a competitive advantage for Saudi firms and build a quality infrastructure for manufacturing and services (KAPSARC, Energy Dialogue Summer 2016, KAPSARC 2017, p. 38). However, there is also some evidence that in-country value add programs can produce mixed results, especially in creating truly competitive international local champions. One is the ultimate aim for such firms to produce and export “new” products or services that can withstand price and quality competition and is a key IKTVA objective. The challenge for domestic firms is that steep barriers to market entry for foreign firms have led to the creation of mostly joint ventures in Saudi Arabia which can disincentive domestic firms from competing independently, but this can be mitigated through R&D collaboration and technology transfer, something which leading Saudi private sector energy-related companies have achieved.

To underline its commitment to the program, Aramco unveiled their 10-year spending strategy at the launch of the IKTVA program in December 2015 in a transparent and detailed manner for all sectors, with a total outlay of \$334 billion planned over the period 2015–2025, illustrated in Fig. 3.9 as well as yearly project spend in Fig. 3.10 by different segments.

Fig. 3.9 Capital program forecast 2015–2025



Source: Al-Abdulkarim, A. (2015). “Supply Chain Opportunities oil and gas.” Saudi Aramco IKTVA launch, 1 Dec. 2015

Fig. 3.10 Aramco 2016–2025 capital expenditure program by different business segments

Source: Al-Abdulkarim, A. (2015). "Supply Chain Opportunities oil and gas." Saudi Aramco IKTV launch, 1 Dec. 2015

The above figures illustrate an average spend of around \$33 bn per annum over the period 2015–2025, with key spending in surface facilities, infrastructure, and drilling (84%), but with unconventional gas and renewables accounting for 10% as noted earlier in the chapter. Aramco's serious intent to see through its localization program, backed by the allocated capital expenditure plans, has thrown a gauntlet to both local and foreign contractors. According to the company, in 2015, it awarded 37% of its material procurement spending, worth \$2.1 bn to local manufacturers, and the total value of contracts awarded to local companies reached \$26 bn (Saudi Arabia, 2015, Facts and Figure, p. 15). In its 2016 annual review, Saudi Aramco noted that the value of its direct material procurement from local manufacturers increased to \$2.9 bn in 2016, representing 43.5% of its material procurement spending (Saudi Aramco 2017e). According to Saudi Aramco, some foreign contractors have indeed taken up the challenge and agreements and JVs have been signed with:

- US-based *Rowan Company and Nabors Industries* to own, manage, and operate drilling rigs
- *Siemens* to formalize collaboration efforts on digitization and fuel treatment
- *Jubail Energy Services Company and ArcelorMittal Jubail* for oil country tubular goods
- *J-Power Systems Corporation* of Japan for submarine electrical cables

Can Aramco's vision be taken further and implemented in the wider Saudi economy? This is discussed in the next section.

Saudi Arabia's Master Contractor

Driving local content policies can be fragmented at the national level, with no simple overarching integral body to effectively leverage national resources and integrate cross-sector opportunities. In the case of Saudi Arabia, Aramco's IKTVA initiative has not gone unnoticed, and Deputy Crown Prince Mohammed bin Salman has used the guiding principles and objectives of Vision 2030 and the National Transformation Program to accelerate a focused in-country value add program, as noted earlier in Fig. 3.3, where "maximizing local content" was a key objective.

Under the government's Vision 2030, four main pillars would accelerate growth of local content:

- (a) *Creating a unified reference for local content development by establishing a distinct oversight body to unify local content initiatives across various-entities.*
- (b) *Supporting regulatory framework by defining effective local content policies and regulations, and reviewing government procurement procedures.*
- (c) *Establishing national standards for local content with clear definitions and specific targets.*
- (d) *Identify sectors, products and markets dynamics by analysing supply and demand in local and regional markets, and identifying the main sectors that will be the centre of focus.*

(Source: *Fiscal Balance Program: Balanced Budget 2020*, p. 75, www.vision2030.gov.sa)

The government has quickly moved forward with implementing some of these pillars, the most notable being the review of government procurement procedures and assessing current projects, with reports that Saudi Arabia is set to shelve or reform billions of dollars of unfinished projects if they do not meet current economic objectives – in essence local content and employment generation with estimates that some SR 1.4 trillion (\$373bn) of capital spending projects are currently underway (Rashad 2017). According to Saudi Finance Minister Mohammed Al Jad'aan, the efficiency drive has saved the Kingdom around SR 80 bn (\$21.3 bn). The appointment of US-based Bechtel Corporation to establish and operate Saudi Arabia's National Project Management Organization (NPMO) in February 2017, to oversee the Kingdom's capital expenditure projects, will assist the NPMO to develop standardized systems and processes across all government ministries and entities and train Saudi nationals to manage the program (Argaam 2017c).

While the government's NPMO office has a lot of catching up to do in applying processes and standards, Saudi Aramco has established a worldwide reputation for implementing its own standards, making the company manage megaprojects and become Saudi Arabia's de facto master contractor. This drive encompasses a footprint across many sectors as the following table illustrates (Table 3.7).

Table 3.7 Saudi Aramco's major in-Kingdom engineering projects

Location	Project name/type	Key elements
<ul style="list-style-type: none"> • Ras Al Khair, Saudi Arabia 	<ul style="list-style-type: none"> • <i>King Salman International Complex for Maritime Industries and Services</i> 	<ul style="list-style-type: none"> • JV with Saudi National Shipping Company, UK's Lamprell, and South Korea's Hyundai Heavy Industries • Estimated cost SR 20 bn (\$5.33 bn) • Full production by 2022 • Engineering, manufacturing, and repair for rigs, vessels • Create 80,000 direct/indirect jobs • \$17 bn impact on GDP
<ul style="list-style-type: none"> • Dammam, Saudi Arabia 	<ul style="list-style-type: none"> • <i>Industrial City</i> 	<ul style="list-style-type: none"> • 50 sq km • Attracting national/international investments • Oil and petrochemicals, automotive, house appliances, medical and military industries
<ul style="list-style-type: none"> • Ras Al Khair, Saudi Arabia 	<ul style="list-style-type: none"> • <i>Fabrication Yard</i> 	<ul style="list-style-type: none"> • JV with McDermott • Fabrication yard for offshore oil and gas platforms • Full production by mid-2020s
<ul style="list-style-type: none"> • Jubail, Saudi Arabia 	<ul style="list-style-type: none"> • <i>Oil to Chemical Project</i> 	<ul style="list-style-type: none"> • JV with Saudi Arabian Basic Industries (SABIC) • Develop oil-to-chemical project, processing petrochemicals directly from crude oil instead of first refining the oil into products such as naphtha • Estimated cost \$30 bn

Source: Saudi Aramco, Arab News

While Aramco oversees other giant projects such as the SR 50 bn (\$13.3 bn) *Fadhili* gas-processing project and the *Wasit* and *Midyan* projects, the *Ras Al Khair* King Salman International Complex for Maritime Industries and Services stands out as a direct Aramco engineering project involvement. Besides the expected benefits listed in the table, the project is also estimated to save up to \$12 bn in import substitution for maritime products and services and create other spin-off benefits. According to Aramco, as the Kingdom's maritime industry evolves and grows, there will be an opportunity to develop an institute for maritime studies, research, and development focusing on maritime professions. As noted earlier, Vision 2030 has set one of its goals for Aramco to become a global engineering and services company. The King Salman maritime project, once completed, will catapult Aramco into this league, as the complex is planned to operate the following four zones:

- *Zone 1*: dedicated to the repair and maintenance of ships and rigs and includes maintenance dry docks and 12 berths with capacity to service more than 15 rigs and 130 ships annually, including VLCCs or very large crude carriers.

- *Zone 2*: dedicated to offshore support vessels, with capacity to build 25 ships and repair 115 offshore vessels a year.
- *Zone 3*: dedicated to the construction of commercial vessels, comprised of VLCC size dry docks, it will have capacity to build 3 VLCCs and 15 commercial vessels of different types annually.
- *Zone 4*: a maritime operation zone with a capacity to build more than 11 fixed offshore platforms and 4 drilling rigs per year.

The “master builder” is not content to only being a contractor but is also planning to create a financing system for Saudi Arabia’s maritime industry, akin to the Export Credit Agency (ECA) approach that will provide investors and customers with competitive financing options for services procured, equipment purchased, or work performed in the King Salman maritime complex. In 2017, the Saudi Press Agency (SPA) reported that Saudi Aramco had obtained the approval of the Saudi government to set up two new companies that will develop and operate a new “Energy City” over 50 sq. km. of land in the Eastern Province. According to the SPA, Aramco will set up one company as a developer laying out the infrastructure of the city and manage its fixed assets, with Aramco eventually owning the fixed assets. The second company is to handle the operations and maintenance of the Energy City (Shamseddine 2017d). According to Aramco, the investment in the city is expected to be around SR 16.5 bn (\$ 4.4 bn). This new Aramco initiative will place the company at the heart of Vision 2030, whereby expanding energy industries will help to achieve the Kingdom’s target to promote local content, as the Energy City is a core initiative in localizing the solar industry, as well as oil and gas services.

During President Trump’s historic first overseas visit of his presidency to Saudi Arabia in May 2017, Saudi Aramco signed around \$ 50 billion of deals and MOUs with major US companies to provide a boost to bilateral trade between the two countries, as well as attracting US capital and technology to Saudi Arabia to see the Kingdom as a “platform for exports to other countries,” according to Energy Minister Al Falih (Shamseddine and Paul 2017a; Saudi Aramco 2017d). Below is a list of the major agreements signed between Aramco and the US companies:

- **GE**: signed an MOU to undertake a digital transformation of Aramco’s operations with a goal of generating \$ 4 billion in annual productivity improvements
- **Jacobs Engineering**: to form a Saudi-based JV company to provide professional program with construction management services for social infrastructure projects, creating 3000 jobs
- **National Oilwell Varco**: a JV with Aramco to provide high-specification drilling rigs and advanced drilling equipment, as well as an education center for Saudi technicians
- **Rowan Companies**: creation of offshore drilling company in Saudi Arabia to also develop jack-up rigs to be manufactured at the *Ras Al Khair* Maritime Yard
- **Honeywell**: MOU for advanced digitization of oil and gas industry and create over 400 jobs
- **McDermott International**: MOU to expand and develop Aramco’s physical and human capital as part of the IKTVA program

- **Emerson:** collaboration for digital transformation of Saudi Aramco operations and R&D in advanced applications for process automation
- **Schlumberger, Halliburton, Weatherford, and Baker Hughes:** separate MOUs to deliver projects related to localizing oil field goods and services.

Collaboration with these US world-class players will ensure that Saudi Aramco has access to some of the most advanced oil and gas technologies and management skills for the years to come.

Saudi Aramco's Corporate Social Responsibility and the Saudi Knowledge-Based Society

Just as Saudi Aramco takes its economic contribution to the well-being of the Kingdom seriously, it has also embraced its corporate social responsibility (CSR) with enthusiasm, even before CSR became an important corporate mission for many international companies. Aramco's outreach programs and commitment to developing the country's future generations of innovators are by focusing on the development of so-called *STEM* (science, technology, engineering, mathematics) skills. Some of the main Aramco initiatives also involve supporting economic entrepreneurship and start-up ventures and include:

- *Wa'ed:* Aramco established *Wa'ed* as an incubator to develop local enterprises with *Wa'ed* offering non-collateralized loans or venture capital partnership. By the end of 2015, *Wa'ed* had approved 18 projects.
- *Rabigh Plus Tech Park:* This Park is integrated within Aramco's Rabigh Refining and Petrochemical Company (Petro Rabigh), a joint venture with Sumitomo Company. The aim is for manufacturers to convert chemicals into consumer products to generate new industries and job creation, and nearly 30 local and international companies from the plastics conversion industry have signed up.
- *Plas Chem Park:* The *Sadara Chemical Company*, a joint venture with Dow Chemicals, has established the Plas Chem Park where manufacturers will transform the chemical streams from *Sadara* into advanced consumer products, and around 25 projects have been approved in the Park.
- *Women's Business Park:* Aramco signed a memorandum of understanding with Princess Nora Bint Abdulrahman University, in 2015 to create a women's Business Park with the aim to provide employment for 20,000 women by 2025. International partners such as General Electric and Tata, established GE-Tata Business Process with Saudi Aramco.
- *Maharat:* This was formed with Aramco's contractors on the Jazan Refinery and Terminal project with the aim of developing young Saudis for specialized construction trades. *Maharat* is expected to train around 5000 Saudis by 2020.

(Source: Saudi Aramco, *Citizenship Report 2014*)

Besides the above initiatives, Aramco has initiated several community awareness programs. Aramco established the John Hopkins-Aramco partnership, which is expected to transform the practice of medicine and healthcare in the Kingdom, with the expectations that the joint venture will deliver enhanced speciality and new lines of treatment and address some of the most significant healthcare challenges, not only in the Kingdoms but also in the region. The Aramco focus on healthcare, not only for its own employees but also for the Kingdom's health service, became elevated especially when the current Energy Minister Khaled Al Falih was previously appointed as Minister of Health and he drew upon the Aramco-John Hopkins JV experience into his Ministry of Health.

Aramco constructed the *Shamah* Autism Center in Dammam, the first multidisciplinary autism center for Saudi children in the Eastern Province as well as financing more than 64,000 new homes for Aramco employees since 1951, under the company's Home Ownership Program. On the education and knowledge diffusion front, Aramco has also been a pioneer, with its *iDiscover Knowledge Incubator*, which toured Saudi cities and provided new math and science teaching techniques to 2000 teachers, reaching over 15,000 students. The same principle was applied to two other initiatives called *iThra Youth* and *iSpark* helping youth hands-on workshops in advanced technology, science, and multimedia and reaching 10,000 students for *iThra Youth* and 53,000 students for *iSpark*. For more mature students, the FABLAB-Dhahran, located on the campus of King Fahd University of Petroleum and Minerals, engaged thousands of participants in workshop topics in 3D printing, laser cutting, electronics, and robotics. On the national level, Aramco was involved in workforce skill development with establishment of the Saudi Petroleum Services Polytechnic (SPSP) for the upstream industry, the National Industrial Training Institute (NITI) for the downstream sector, and plans for establishing a National Power Academy, a high-end construction institute, as well as a National Civil Security Training Academy. In May 2017, Saudi Aramco went one step further by announcing that it had signed an MOU with the Technical and Vocational Training Corporation and the Saudi Commission for Tourism and National Heritage to establish the National Training Centre for Facilities and Hospitality Management, with a target of reaching a training capacity for 5000 male and female trainees over the next 4 years (Saudi Gazette 2017).

While Aramco's CSR initiatives are laudable, the planned IPO might force the company to reconsider some of these initiatives, as some investors might question whether a privatized energy company and its management could afford to be distracted from its core activities. This will be explored more fully in a later chapter.

Chapter 4

From NOCs to Privatized Oil Companies: A Comparative Country Experience

Whatever is worth doing at all, is worth doing well

Chesterfield

Why Privatization?

During the early 1990s, and as a part of a widespread drive for “freer” markets and reforms across the globe, a number of full and partial privatizations of government-owned enterprises, including national oil companies (NOCs), occurred. In the late 1970s and 1980s, government intervention in the economy came under attack, and the Keynesian basis for state economic intervention started to fall out of favor. Developing country economies failed to perform well in many cases, and this failure was attributed to inefficient, ineffective, and often corrupt government intervention (Dharwadkar et al. 2000). This trend seemed to have been triggered by a number of factors, including lower commodity prices, rising revenue needs among the governments engaging in restructuring programs, pressure from international capital markets, especially for countries that were indebted, and seemingly internal shifts in public preferences with regard to market organization and the roles of government (Wainberg and Foss 2007; Black and Boat 1994).

International economic and political circumstances can, and often do, change, and cycles of higher commodity prices, increased government revenues, friendlier international capital markets, and changed political landscapes can reverse the situation and make the case for privatization less urgent. The theoretical arguments for and against privatization still rages (Heath 1997; Hodge 2000; Selar 2000; Sheshinski and Lbpez-Calva 1999; Megginson and Netter 2001) and can be summarized as follows:

A. Arguments for continuing state ownership include:

- State ownership allows pursuit of social objectives and not just profit maximization.
- State ownership is due to a response to market failure and price manipulation by financial actors.
- State ownership is a response to asymmetric information and incomplete contracts, whereby under private ownership, managers of privatized entities

serve two masters, shareholders and regulators, while public ownership managers serve only one. As such, incomplete contracts and one-sided information are reduced.

B. Arguments against state ownership include:

- State-owned enterprises are relatively inefficient compared to their privatized/ publicly listed peers, due to weak or adverse incentives to management.
- State-owned enterprises are relatively inefficient due to inadequate monitoring by external shareholders.
- State-owned enterprises are inefficient due to soft budget constraints, with state managers not applying full marginal cost-benefit budget project allocation.
- State-owned enterprises are inefficient because governments can use them to pursue noneconomic objectives, such as reinforcing populist political support at the expense of efficiency.

How does the above resonate with natural resources, specifically the oil and gas sector?

State Participation in the National Resource Sector and NOC Privatization Trends

The main drivers of state participation in the natural resources sector fall under two general headings – noneconomic and commercial and fiscal (McPherson 2008).

- *Noneconomic objectives:* These can be both of a symbolic and practical nature. The symbolic side presents national oil companies (NOCs) as national champions, protection of sovereignty, and national interest, with slogans such as “the oil is ours,” and it would be hard to underestimate the emotional appeal of NOCs in this role, past and present (Noreng 1994). This symbolic objective is one of the major issues that the currently planned Aramco IPO has to address. On the practical side, state participation is expected to regulate the behavior of private sector investments in the national interest and to address a wide range of development goals outside the resource sectors such as job creation, promotion of local content as a policy, and the provision of social and physical infrastructure. As noted in the preceding chapter, Saudi Aramco has been involved in many of the above wider developmental goals, and whether these will still remain at the heart of a privatized Aramco is another issue that has to be addressed.
- *Commercial and fiscal objectives:* These objectives are focused on maximization of revenues flowing to the state from the NOCs in the form of royalties, taxes, and dividends. Over time, most countries qualified the pursuit of straightforward revenue maximization, by having other fiscal objectives such as containment of project risk and the need to compete with other countries involved in the same line of activities such as refined oil production.

The first NOC in a developing country was created in Argentina in 1922, as shown in Table 4.1, and post Second World War, the trend toward the creation of NOCs achieved a momentum as former colonies became independent.

Table 4.1 Selected NOCs and year established

Country	National oil company	Date of creation
<i>Argentina</i>	VPEA	1922
<i>Chile</i>	ENAP	1926
<i>Russia</i>	Various	1934 ^a
<i>Peru</i>	PetroPeru	1934
<i>Bolivia</i>	YPFB	1936
<i>Mexico</i>	Pemix	1938
<i>China</i>	PetroChina	Early 1950s
<i>Colombia</i>	Ecopetrol	1951
<i>Iran</i>	NIOC	1951
<i>Brazil</i>	Petrobras	1954
<i>India</i>	ONGC	1956
<i>Iraq</i>	INOC	1961
<i>Saudi Arabia</i>	Petromin	1962
<i>Algeria</i>	Sonatrach	1965
<i>Indonesia</i>	Petarmina	1968
<i>Libya</i>	Libya NOC	1968
<i>Norway</i>	Statoil	1982
<i>Ecuador</i>	Petroecuador	1973
<i>Malaysia</i>	Petronas	1974
<i>Kuwait</i>	KPC	1975
<i>Venezuela</i>	PdVSA	1976
<i>China</i>	CNOOC	1982

Source: UNCNRET, *State Petroleum -Enterprises in Developing Countries*. 1980; company-reports

^aRussia nationalized its oil industry in 1918, but the industry was not consolidated into NOCs until 1934

In the period 1960s to the 1970s, besides the end of European colonial rule, there was also the rise of nationalistic movements which gave impetus to several major oil-producing nations to nationalize their oil reserves (Cuervo-Cazurra et al. 2014). The establishment of OPEC in September 1960 by the five founding member states (Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela) spurred the nationalization of their oil companies in the 1960s and 1970s (Ramady and Mahdi 2015). However, the experience with state participation in the resource sectors has brought up a number of issues at both the economy-wide and sector-specific levels, causing some countries to rethink their sovereign ownership models and to replace this with either a full or partial privatization regime, as illustrated in Table 4.2.

Table 4.2 Full or partial privatization of national oil companies

Company	Date or privatization	% of state ownership sold
<i>YPF – Argentina</i>	1993, 1999	58%, 100%
<i>YPFB – Bolivia</i>	1996	50%
<i>PetroCanada</i>	1995, 2002	81%
<i>Sinopec</i>	1998	45%
<i>PetroChina</i>	1998	10%
<i>CNOOC – China</i>	1998	29%
<i>Elf – France</i>	1992, 1994	49%, 100%
<i>Total – France</i>	1992–1998	30%, 100%
<i>ENI – Italy</i>	1995–2001	15%, 70%
<i>Yukos – Russia^a</i>	1994	100% ^a
<i>Statoil – Norway</i>	2001	20%
<i>Gazprom – Russia</i>	1994	61%
<i>Repsol – Spain</i>	1989–1997	80%
<i>BP – UK</i>	1979–1995	100%
<i>Petrobras – Brazil</i>	1995	49%
<i>Lukoil – Russia</i>	1994	92%

Source: Wainberg and Foss (2007, pp. 6–7)

^aRosneft acquired a Yukos unit representing about 60% of its crude oil production in 2004

Excluding Argentina, full privatization of NOCs has only occurred in France, the UK, and Russia with Yukos’s acquisition by Rosneft in 2004. The overwhelming model has been one of partial privatization, averaging fewer than 50% for the remaining NOCs. There does not seem to be any single reason why these ranges of privatization models have occurred. In essence in those situations in which host governments view energy as “too important to be left to the market,” government intervention and ownership will still be the strongest, especially if the country is a major hydrocarbon producer and hydrocarbons are the main source of revenues for the state. In this case, the energy sector is viewed as “strategic” as opposed to it being a market-led commodity, as illustrated in Table 4.3.

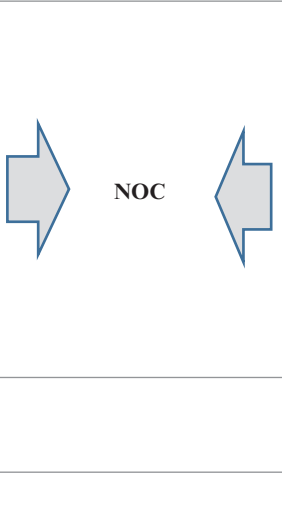
Table 4.3 Energy sector’s organization of NOCs

Conditions	IF: energy is deemed strategic	IF: energy is deemed a commodity	Outcomes
If: <i>Tendency is toward centrally planned economies</i>	<i>High</i>	Moderate to low	Then: government-based solution for energy
If: <i>Tendency is toward market-based economies</i>	Moderate to low	<i>High</i>	Then: market-based solutions for energy

Source: Wainberg and Foss (2007, p. 11)

The final outcome for how an NOC is perceived is not often as clear-cut as the above table might imply, as some NOCs may be viewed as a strategic resource, but the sovereign follows a market-based economy, such as the case of Saudi Arabia and Aramco. Whether NOCs are deemed to be of a strategic or of a mere commodity nature, they all face internal and external forces that can influence the final outcome of how much or how little an NOC can be privatized. These conflicting forces are illustrated below (Table 4.4).

Table 4.4 Critical internal and external forces facing NOCs

Internal (domestic) factors impacting NOC	 NOC	External (international) factors impacting NOC
Internal energy and materials requirements		Export strategies for regional, global markets
Political organization and “golden share” by government		Global supply-demand balances and commodity prices impact
Labor unions and labor politics		Goals, objectives of investors (foreign and domestic if used)
Revenue priorities for host government and dependency		Minimum requirements of global capital markets
Regulatory framework and conditions for access		Interactions between investors and regulator
Funding constraints		Access to capital markets
Governance structure		Conflict of interest
Commercial efficiency		
Noncommercial objectives		Commitment to producers production agreements

An important issue posed by state participation in NOCs is to undermine governance, as NOCs were naturally controlled by political leadership and ruling elites who flew the flag of sovereignty and national interest, but who might be more interested in pursuing their own political agendas. As such, the operation of NOCs becomes nontransparent and the management of these NOCs becomes politicized (Aharoni 1986). Funding state participation presents another set of problems for NOCs, as the resource sector can be both a generator of cash and cash hungry in times of needed capital expenditure, which can conflict with other national development objectives, thus creating social and political tensions (Lawson 1994). One contentious area of potential conflict of interest can relate to the promotion of local capacity and content, which involves employment and procurement policies which might encourage cronyism for job allocation and preference for some contractors and resultant corruption. Privatization, whether full or partial, should be able to replace state funding with private sector investments and capital flows through

capital market bond issues. This could relieve tensions over-budget allocations and also avoid putting public funds at risk due to lack of commercial efficiency. Underfunding or erratic funding by the state also plays major role in commercial inefficiency.

On external forces affecting NOCs, conflict of interest can arise when the NOC finds itself simultaneously cast in the role of a partner to international private investor, and acting on its own commercial interest, and also of a regulator, an issue common under production sharing agreements. Internal inefficiencies and daunting technological and financial challenges have caused some NOCs to opt for joint ventures or other forms of commercial contract with international oil companies in both upstream and downstream operations, as many NOCs have held virtual monopoly positions over petroleum refining, transportation, and storage. This lack of competition can be an important factor in explaining enterprise underperformance in developing countries (Arocena and Oliveros 2012).

Noncommercial objectives, whether social, economic, or political, are featured importantly in most NOC agendas and sometimes are embedded in religious responsibilities (Noreng 1997). As noted in earlier chapters, Aramco places great emphasis on its corporate social responsibility programs, and other NOCs also pursue some or all of the following programs (Prizzia 2001):

- *Job creation:* Despite oil being a capital, rather than a labor-intensive industry, most NOCs are expected to provide employment to nationals and typically have higher than industry average employees per barrel or employees per revenue of net income.
- *Local capacity and content:* Most NOCs are expected to develop local technical, commercial, and managerial capacity in the oil sector and beyond and sometimes are not well equipped to take on this role because of limited operational experience, or because of their constrained ability to operate commercially.
- *Social infrastructure:* NOCs are often requested to fund and directly support local community services, which can be expensive and take management outside their core competencies. The privatization of NOCs and removal of some of these social infrastructure support and services can become contentious issues (Prizzia 2001).

A range of possible solutions exists to overcome some of the above internal and external forces hindering the efficiency of NOC operations. These are summarized in Table 4.5.

Table 4.5 Addressing NOC internal/external factors

Factor	Remedial action and reform strategy
(a) <i>Commercial efficiency</i>	<ul style="list-style-type: none"> • Benchmarking: comparison of key indicators of operating and financial efficiency between NOCs and IOCs • Limited competition: among NOCs or different subsidiaries of a single NOC • Unrestricted competition: competing with private sector operators, most common in retail outlets • Joint ventures: NOC can benefit from technical, managerial, and commercial skills of JV partners • Partial privatization: sell to strategic investor or partial sale to public • Divestiture of noncore assets: outside oil and gas business • Full privatization: complete break from state ownership
(b) <i>Noncommercial obligations</i>	<ul style="list-style-type: none"> • Transfer noncommercial social, economic, and political functions to government leaving NOC to manage commercial activities. Important that institutions taking over these functions (e.g., schools, hospitals) from NOCs are adequately funded and managed to avoid public backlash
(c) <i>Governance</i>	<ul style="list-style-type: none"> • Commercialization/privatization implies an adequately constituted Board of Directors capable of providing independent, objective oversight and direction, a profit-oriented internal restructuring with strong internal financial oversight, and corporate planning functions. Retention of cash flow is key
(d) <i>Conflict of interest</i>	<ul style="list-style-type: none"> • Transfer policy and regulation roles from NOC to the government and a quasi-independent regulatory agency, leaving NOC with purely a commercial role but not easily done unless the regulator is adequately staffed and funded

Source: Adapted from McPherson (2008)

NOC Country Case Studies: Has Privatization Met Expectations?

The discussion above has indicated that NOCs and their ownership evoke strong emotion and governments have to take this into consideration when contemplating full or partial privatization of their NOCs. A key to public acceptance is choosing a model that suits a country best, given the country's economic and social structure. The more an economy is market forces driven and has a strong democratic political participatory system, the more likelihood that a more comprehensive NOC privatization can be successfully contemplated, compared with more centralized economic planning and less democratic countries. However, not all countries neatly fit into these two categories, with a range of economic and political systems available, thus providing more flexibility in choosing a particular NOC privatization path.

Four country case studies from *Russia, Norway, Brazil, and China* have been chosen to illustrate the different paths chosen, as well as assessing whether there are any common elements that bind them which can provide a guide or "blueprint" for the planned Aramco IPO, to be examined in the next chapter.

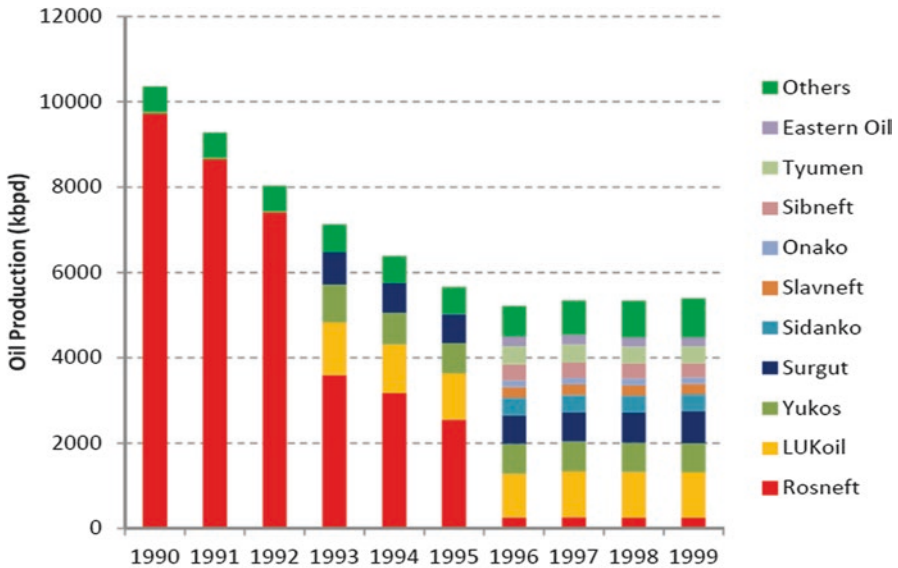
Russia's Rosneft

The privatization of the Russian oil industry is somewhat unusual, as there seemed to be no compelling rationale to do away with state ownership since there appeared to be little evidence of any direct correlation between ownership type and the establishment of a world-class oil company (Kim and Yelkina 2003). Unlike single company state ownership which is the norm for countries like Saudi Arabia (Aramco), the UAE (Abu Dhabi National Oil Company), and Venezuela (Petroleos de Venezuela), for Russia, the international experience seemed to offer no clear consensus on the merits of privatizing, and some have attempted to explain this drive as simply meeting the self-interest of “tycoons” and “oligarchs” from the private sector. Some have also suggested that corporations run by post-Soviet tycoons have allegedly “in large part determined the foreign and domestic policy of Russia and influenced the choice of economic priorities” (Lane and Seifulmulukov 1999). Even President Putin has likewise accused companies in the natural resources sector of being prepared to sell their oil and gas resources, “boosting their capitalization at the nation’s expense” (Putin 1999). It has been noted that while a pervasive influence of corporate groups on public policy is undesirable, since narrowly focused groups seek only to increase their share of national income, instead of increasing national wealth, big business in Russia can also be a positive force for change, as tycoons have also supported the need for a rule-based market environment in order to attract foreign investment to further enhance the value of their companies (Sim 2017, p. 7).

The story of Rosneft’s rise is a checkered one. Following its formation in 1993, Rosneft was the largest oil company in Russia, but during the mid-1990s, it was stripped of almost all its major assets as new oil companies were formed and privatized under the Yeltsin regime. The election of Vladimir Putin as President of Russia marked a change in Rosneft’s fortunes, and the company became one of the cornerstones of Putin’s presidency to retake control over the “commanding heights” of the economy and energy sector (Henderson 2012, p. 1).

However, Rosneft’s changed fortune was not easy, and, as Fig. 4.1 illustrates, the company saw its production profile falling from 1990 to 1999 in comparison with the rest of the Russian oil sector, as its assets were stripped away to form the bulk of the domestic companies that were privatized in the early 1990s by Boris Yeltsin.

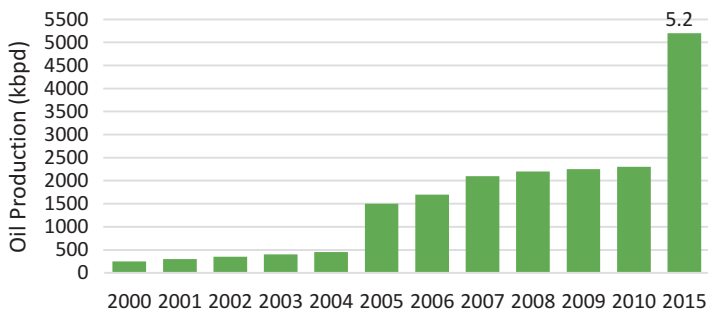
Fig. 4.1 Rosneft's declining oil production by Russian company, 1990–1999



Source: Henderson (2012, p. 5)

Rosneft's decline in the above period was not only due to operational problems but also to disputes among the company's senior management especially during the period of low oil prices, which impacted Rosneft's profitability and ability to make new investments. The disagreements between the company's senior management were of a strategic nature involving Alexander Putilov, Rosneft's President, and Yuri Besspalov, the Chairman, over the potential privatization of the company, leading to delays in taking this forward. It was not until 2000 that the process of restoring Rosneft to its previous position as Russia's major oil company began. Under the aegis of President Putin, Rosneft began with the consolidation of the company's existing subsidiaries under a new Management Chairman Igor Sechin, who is still the main driving force at Rosneft as of 2017. To become a true national oil champion, Rosneft moved quickly to increase in size both organically and by acquisition in order to expand its influence over Russian oil output as well as future production strategy, and this growth in production is illustrated in Fig. 4.2. In essence, the changes that took place within Rosneft seemed to mirror Russia's economic and political evolution under President Putin (Poussenkova 2007; Wright et al. 1998).

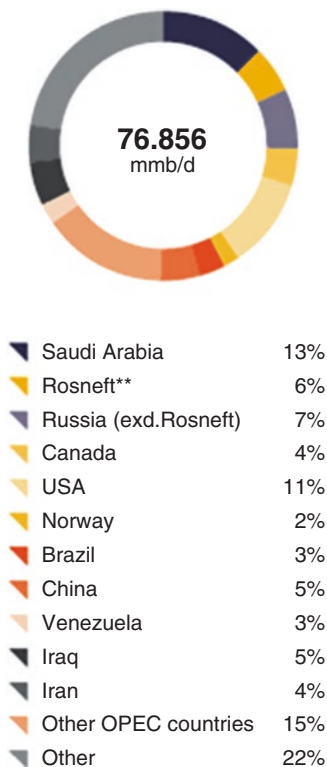
Fig. 4.2 Rosneft oil production profile since 2000



Source: Rosneft Company Annual Reports, 2007, 2010, 2016

By 2015, Rosneft was producing 5.2 million bpd or nearly 50% of total Russian oil production of around 10.4 million bpd, and this continued in 2016 whereby the Russian global share of oil production reached the same level as Saudi Arabia, surpassing the USA as illustrated in Fig. 4.3.

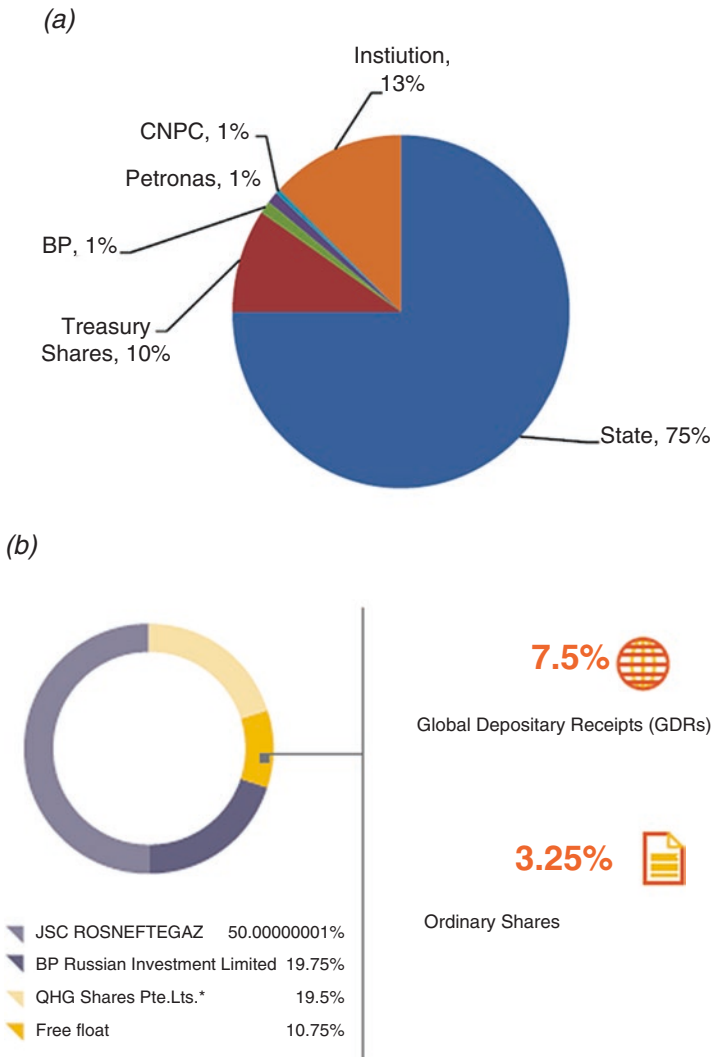
Fig. 4.3 Russian share in global oil production mmb/d (2016)



Source: Rosneft Annual Report, 2016, p. 30

A key milestone however was the company's IPO to international investors to establish the NOC among the leading peer group of publicly quoted oil majors. Rosneft's IPO was launched in 2006 (Rosneft 2006, Offer Document), and the company sold 14.8% of its total equity for \$10.4 bn, implying a value for the whole company of around \$80 bn. The shares were sold to a combination of institutional and private investors in London and Moscow, as well as to three strategic investors (BP, 1.2%; Petronas, 1%; and CNPC, 0.5%), with the Russian government retaining an 85% stake. Rosneft's shareholder structure has changed over time, as illustrated in Fig. 4.4, indicating that the Russian state is still the majority owner, but with BP increasing its share to nearly 20%.

Fig. 4.4 (a) The shareholder structure of Rosneft in 2011. (b) Rosneft shareholder structure in 2016



Source: Rosneft, Annual Reports 2011, 2016

The increase in BP's stake in Rosneft followed the takeover by Rosneft of TNK-BP (Tyumen Oil Company-BP) in March 2013, for \$55 bn, with BP collecting \$16.7 bn and a 12.5% stake in Rosneft, making Rosneft the world's largest listed oil producer (Neate 2013). The sale of TNK-BP to Rosneft ensured that BP also had two seats on the Board of Rosneft, making the deal the biggest takeover in Russian history. BP's partners in the troubled TNK-BP shareholders were billionaire oligarchs who collected \$27.7 bn from the sale (Neate 2013).

In July 2006, Rosneft carried out listing of global depository receipts (GDRs) on the London Stock Exchange. The issuance of GDRs, which certify rights in respect of ordinary shares of Rosneft in accordance with foreign law, was carried out by JPMorgan, and these GDRs represented 7.5% of total issued 10.598 billion shares. According to Rosneft's 2015 Annual Report, major foreign institutional investors of Rosneft included some of the most prominent banks and investment firms such as Credit Suisse, HSBC, JPMorgan Asset Management, The Dreyfus Group, BlackRock Inc., Deutsche Asset Management, Neptune Investment, Pictet, and UBS Asset Management, to name but a few (Annual Report 2015, p. 157).

The emergence of Rosneft as a publicly quoted company on both the Moscow and London Stock Market not only allowed finance to be raised for the government and the company but, as will be discussed below, also changed the dynamics of the company's development as a global player, and the company itself now describes its overall target as being to reach the status of a "super-NOC" (Rosneft 2015, pp. 36, 38). A combination of objectives, the advantages of being a state-controlled NOC with insulation from political risk, access to policy makers, and best practice corporate goals in line with IOCs such as creating discipline, good corporate governance, and transparency transformed the company. This combination of objectives, and its status as a partially privatized NOC, places Rosneft in a peer group defined by the World Bank as "partial NOCs" (Stevens 2011, p. 34) and includes Petrobras, Statoil, and Sinopec – all assessed in this chapter.

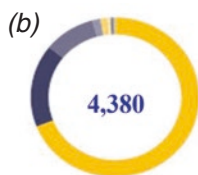
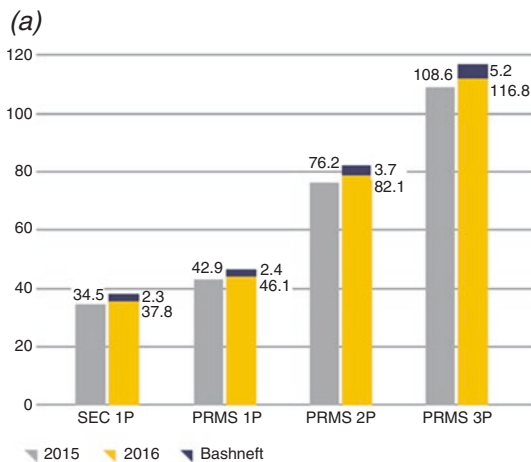
Rosneft became a target for international investors when in December 2016, it was announced that both Glencore and the Qatar Investment Authority will take a 19.5% stake in the company from its government-owned parent company Rosneftegaz (Farchy and Hume 2016). Under the structure of the deal, Qatar invested euro 2.5 bn and Glencore euro 300 million in a special purpose 50/50 vehicle, with Haly's Intesa Sanpolo Bank providing the "bulk" of the debt financing for the remainder of the euro 10.2 bn deal, but Russian banks also providing financing and credit support (Farchy and Hume 2016). The deal received major publicity and was unveiled live on Russian state TV on 7 December 2016 by President Vladimir Putin and Rosneft Management Chairman and Chief Executive Igor Sechin, as the largest foreign direct investment into Russia since the USA and EU imposed sanctions on the country over its actions in Ukraine in 2014. The transaction has raised some questions on the final identities of those involved, given that public records show the ownership structure of the stake ultimately

includes a Cayman Islands Company whose beneficial owners cannot be traced, as well as the owners of the Singapore-registered investment vehicle that holds the newly privatized 19.5% stake in Rosneft called QHG Shares (Golubkova et al. 2017). This changed the Rosneft ownership structure to the one noted earlier in Fig. 4.3a, b as follows: JSC Rosneftegaz 50% plus 1 share, BP Russian Investment Ltd. 19.75%, QHG Shares Pte. Ltd. 19.5%, and free float 10.75% (Intertax 2017; Rosneft 2017). In June 2017, the Rosneft's Board of Directors added two new members, with Glencore PLC Chief Executive Ivan Glasenberg and the President of Research and Development at Qatar Foundation, Mr. Faisal Al Suwaidi joining the Board (Beirman 2017). In a further ownership twist highlighting larger geopolitical interests, the Chinese conglomerate CEFC agreed in September 2017 to buy a 14.6 % stake in Rosneft for \$9.1 billion from Glencore and the QHQ, strengthening the energy partnership between Russia and China in the face of renewed US economic sanctions legislation. Glencore and the Qataris will then retain stakes of 0.45% and 4.7% in Rosneft, respectively (Astakhova and Aizhu 2017). In September 2017, Rosneft shareholders approved the appointment of the former German Chancellor Gerhard Schroeder as Chairman of the company. The former Chancellor was a strong advocate of German- Russian economic and energy cooperation and his appointment, while meeting with some anger in Germany, is expected to boost Rosneft's international credibility (BBC 2017).

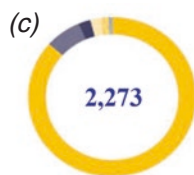
The deal signing with Glencore and the Qataris was also geopolitically driven and came on the heels of the OPEC and non-OPEC producers to agree on a production cut on 10 December 2016, the first time since 2001, with Russia pledging to cut 300,000 bpd from around 11 mbpd according to Russian Energy Minister and Rosneft Board Member Alexander Novak (Raval and Sheppard 2016). The OPEC-non-OPEC agreement could have been purely coincidental, but given Mr. Igor Sechin's lack of enthusiasm in cooperating in an earlier OPEC-Russia production "freeze" discussions, there is a high probability that larger Russian geopolitical factors were at play contributing to a seemingly "win-win" situation for Rosneft and OPEC. The sale of Rosneft shares was the largest under the Russian privatization program in 2016 in an attempt to raise extra cash for its national budget amid low oil prices, and, in order to make its shares more attractive to foreign investors, Rosneft adopted a new policy of paying 35% of its net profits in dividends (Farchy and Hume 2016).

As part of its internationalization and quest for more transparency, Rosneft's hydrocarbon reserves have been independently audited by the US company DeGolyer and MacNaughton using the US SEC (Securities and Exchange Commission) classification (a company that has also been chosen by Saudi Aramco for its own reserve audit), as well as according to the PRMS (Petroleum Resources Management System), and these are set out in Fig. 4.5.

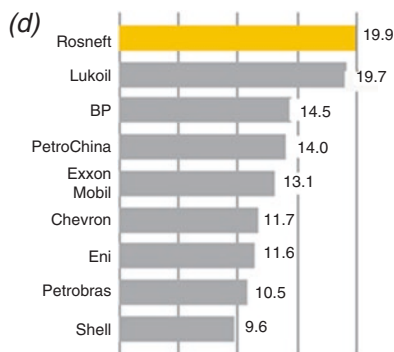
Fig. 4.5 (a) Rosneft’s hydrocarbon reserves (SEC and PRMS) in billions of oil equivalent 2015, 2016. (b) Proved hydrocarbon liquids reserves (oil, gas condensate, HL) according to PRMS, mmt. (c) Proved marketable gas reserves according to PRMS, bcm. (d) Rosneft and other major NOC’s and IOC’s reserve life (according to SEC rules) in years. 2016



Western Siberia	3,025.8
Central Russia	730.2
Eastern Siberia	434.1
Timan-Pechora	69.1
Outside Russia	59.5
Southern Russia	25.5
Offshore (excluding the Arctic Region)	23.1
Far East	9.1
Arctic Shelf	4.1



Western Siberia	1,967.8
Eastern Siberia	157.4
Central Russia	54.8
Southern Russia	45.7
Offshore (excluding the Arctic Region)	35.8
Outside Russia	8.1
Timan-Pechora	2.1
Far East	1.7

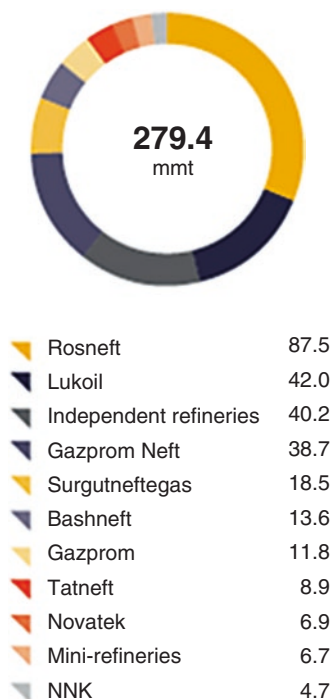


Source: Rosneft Annual Report, 2015, pp. 31, 72, 73

As of 31 December 2016, the proven hydrocarbon reserve of Rosneft was approximately 37.8 bn boe (barrel of oil equivalent), based on the findings of DeGolyer and MacNaughton, of which hydrocarbon liquids and gas reserves approximated 24.7 bn barrels. According to Rosneft, the hydrocarbon reserves replacement in 2015 was 124% as per SEC classification, and according to the SEC classification, Rosneft's proven hydrocarbon reserves in 2016 were significant for 19 years of production (Rosneft, Annual Report, 2016, p. 31). Figure 4.5c compares Rosneft's reserve life to other NOCs like Statoil, Petrobras, and PetroChina as well as to leading IOCs like Exxon Mobil, BP, and Chevron with Rosneft possessing the longest reserve life, excluding Aramco. Figure 4.4a also illustrates Rosneft's reserves according to PRM classifications, under PRM1 (*proved*), PRM2 (*possible*), and PRM 3 (*probable*) scenarios. The difference between the 2015 reserves using SEC and PRM1 is 8.4 bn of oil equivalent or nearly 25%, illustrating the difficulties in agreeing to a common reserve audit classification, an issue that will be discussed for Aramco in the next chapter. Figure 4.4b indicates that Rosneft's international reserve exposure for both liquids and gas is quite limited, with the major Rosneft reserves located primarily in West Siberia.

Since joining the ranks of the privatized NOCs in Russia in 2006, Rosneft has moved fast to reassert its dominant position both in the upstream oil production as noted above and in the downstream refining sector and is now Russia's biggest refiner with nearly 32% of the country's refinery production in 2016 as illustrated in Fig. 4.6.

Fig. 4.6 Russian Federation oil refinery production 2016 (mmt/yr)

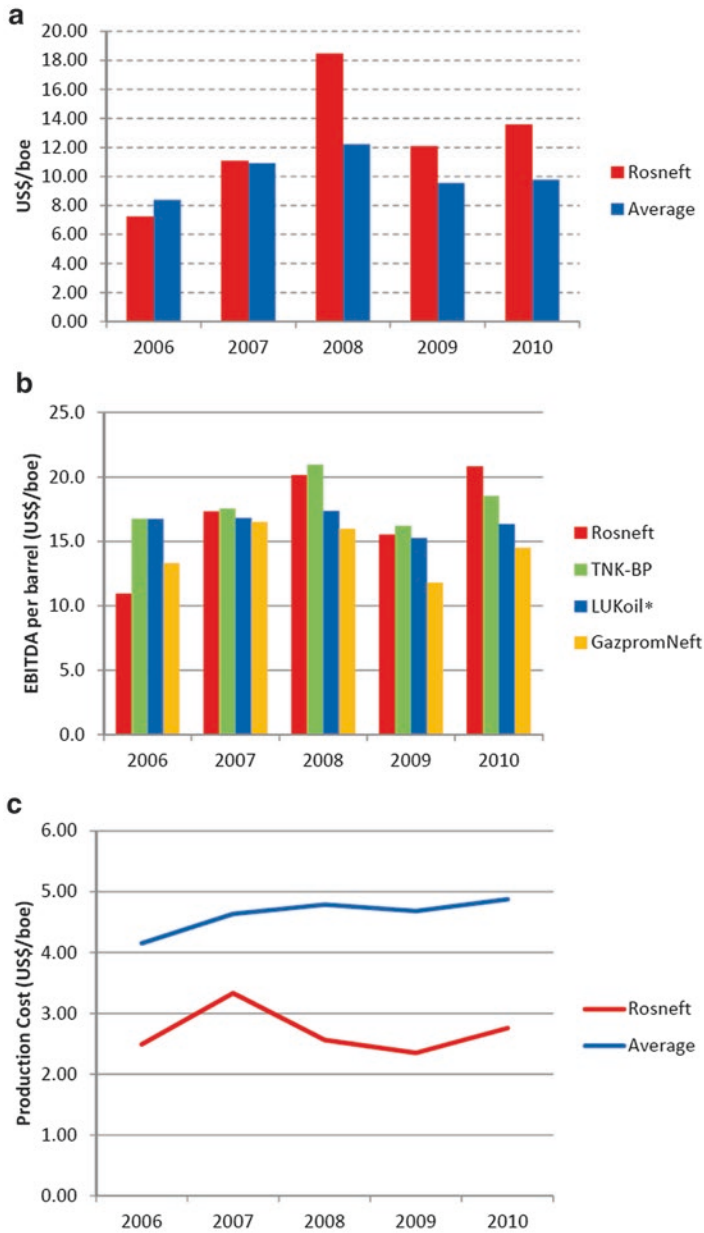


Source: Rosneft, Annual Report 2016, p. 33

The company is also planning further growth of its hydrocarbon production during the period 2016–2018 in East and West Siberia fields, and it has also exploited its preferential rights to licenses on the Russian continental shelf, where it has acquired acreage in the *South Kara*, *Laptev*, *Okhotsk*, *Barents*, *Pechova*, and *Black Seas* (Rosneft, Annual Report, 2015). Rosneft's focus seems to establish an international business and developing specific technical expertise, for example, in exploiting Arctic offshore exploration and development, preferably in cooperation with an IOC partner. Rosneft has developed a firm partnership with ExxonMobil of the USA to develop three licenses in the *South Kara Sea* to jointly invest in these assets. Given Rosneft's majority state ownership, the company could not disentangle itself from political problems that arose in 2017 following the election of Donald Trump as the US President with allegations of Russian interference in the American election process. Under these circumstances, the US Treasury refused ExxonMobil's request to bypass US sanctions against Russia to resume drilling for oil, with the American company requesting these 2015 waivers to enable it to meet its contractual obligations in Russia, pointing out that competitor companies such as Italy's Eni were authorized to undertake such works under European sanctions. Exxon has been eager to unlock the vast oil and gas bonanza locked in these Russian regions since 2011, when the former Exxon Mobil CEO and US Secretary of State Rex Tillerson signed the cooperation plan with Rosneft, personally blessed by President Vladimir Putin, with an estimated \$500 billion investment in these projects over the next decades (Carroll and Katz 2017).

Since partial privatization in 2006, Rosneft's strategy has been to focus on becoming a more commercial organization intent on generating increased returns from its asset base, as evidenced from Fig. 4.6. This illustrates the company's relative outperformance on financial metrics compared to its Russian peers in terms of upstream profitability per barrel, EBITDA (earnings before interest, tax, depreciation, and amortization per barrel), and production costs per barrel well below industry average (Fig. 4.7).

Fig. 4.7 (a) Upstream profitability of Russian oil companies (2006–2010). (b) EBITDA per barrel for Russian oil companies (2006–2010). (c) Rosneft's production costs versus the Russian average

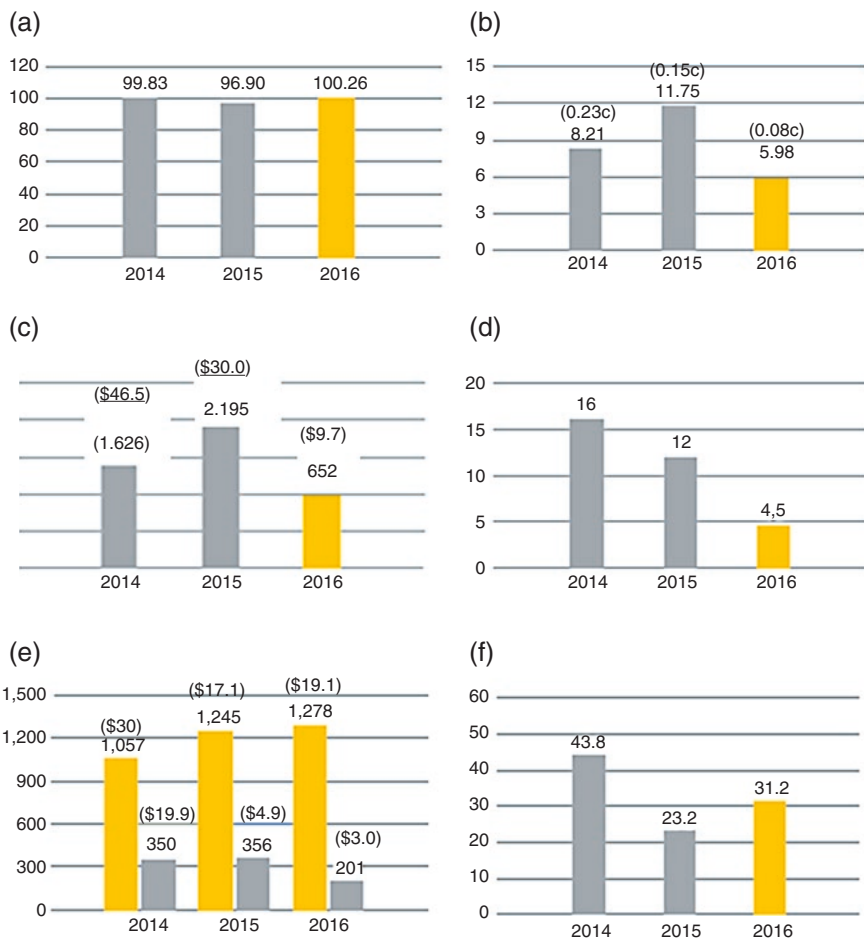


Source: Henderson (2012, pp. 16, 17)

*Taken over by Rosneft in 2012

By 2010, Rosneft moved from being the least profitable company in 2006, to the most profitable, and improved its operational performance by managing to keep its production costs per barrel well below industry average. This transformation from a below average domestic performer to a leading NOC illustrates the potential that can be realized from the twin advantages of the company being a Russian NOC while also having an increasing focus on shareholder returns (Henderson 2012; Stevens 2011), akin to the contemplated Aramco partial privatization. As Fig. 4.8 also notes, Rosneft continued to improve on many of its key financial matrices, including operating cash flow, EBITDA, and net debt over the period 2014–2015.

Fig. 4.8 Rosneft key indicators 2014–2016. (a) Refining throughput, mmt/pa. (b) Dividends per share, RUB/share (\$/share). (c) Operating cash flow, RUB bn (\$ bn). (d) Adjusted free cash flow (USD bn). (e) EBITDA and net profit, RUB bn (\$ bn). (f) Net debt as at the end of the year (USD bn)



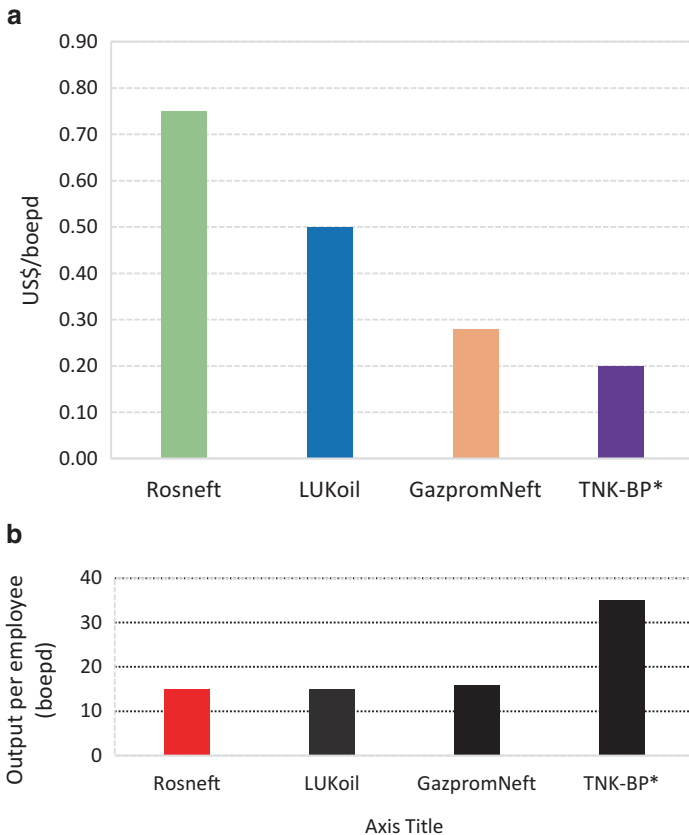
Source: Rosneft 2016 Annual Report. p. 31

Note: ruble/dollar exchange rates: 2014 = 35; 2015 = 73.0, 2016 = 67.0

The company's performance while continuing to improve in Russian ruble terms fluctuated in US dollar terms, given the sharp devaluation fluctuations in the Russian currency since 2014, but which had stabilized at the 56 level by mid-2017. What is notable was the decrease in Rosneft's net debt to \$23.2 billion by the year-end 2015, from \$57 billion in 2013, with the reduction attributed to the repayment of a significant portion of short-term debt as a result of cash flow generation and to receipt of funds under long-term contracts for oil supply and issuance of bonds in the domestic market. However by 2016, the company's debt had risen to \$31.2 billion.

The benefits of being a country's NOC can come with extra burdens of government-imposed obligations that can inhibit the performance of an NOC as a commercial entity, especially when an NOC has to take on responsibility for investing in socially or politically important sectors and ensure a large employee base. These CSR issues were highlighted in the previous chapter for Aramco, and as the next figure illustrates, Rosneft's social spending and production per employee are higher than its Russian peers (Fig. 4.9).

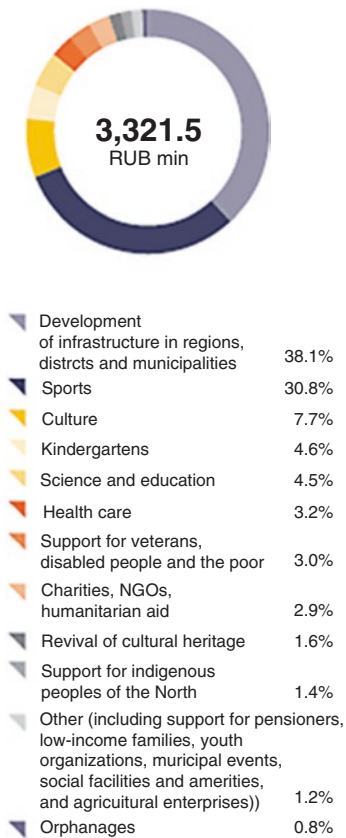
Fig. 4.9 (a) Rosneft's social spending per barrel of production compared to domestic peers (2010). (b) Rosneft's production per employee compared to domestic peers (2010)



Source: Henderson (2012, p. 21)
 Note: *Taken over by Rosneft in 2013

Rosneft's social spending amounted to rubles 3.321 bn (\$49.6 million) in 2016, spread over many charity projects as illustrated in Fig. 4.10.

Fig. 4.10 Rosneft charitable donations 2016



Source: Rosneft 2016 Annual Report, p. 151

The major donations were in development of social infrastructure in the regions of Rosneft presence, sport, education, and culture events as well as veterans and pension groups. In addition, assistance to the indigenous people of the North is an important charitable activity for Rosneft. Unlike Aramco's CSR where the company owns and operates major programs and activities, Rosneft makes charitable donations, and the amounts provided are clearly listed, unlike Aramco's lack of financial data breakdown for its CSR activities. Despite these additional Rosneft charitable donation costs, the company has performed well against its peers and has been rewarded by investors with a premium rating over its peers as illustrated in Table 4.6.

Table 4.6 Valuation metrics for Rosneft, LUKOIL, TNK-BP, and GazpromNeft

	Mkt. cap.	EV	EV/reserves	EV/production	PE ratio
	US\$bn	US\$bn	US\$/boe	US\$/boe	2011 ×
Rosneft	69.2	87.2	5.78	103.7	5.4
LUKoil	44.7	50.5	2.88	62.1	3.5
TNK-BP ^a	42.5	44.0	4.99	69.0	4.8
GazpromNeft	18.6	23.8	3.85	91.9	3.5
Average ex Rosneft			3.91	74.32	3.93
Rosneft premium			48%	40%	37%

Source: Henderson (2012, p. 22)

^aNote: TNK-BP was taken over by Rosneft in 2013

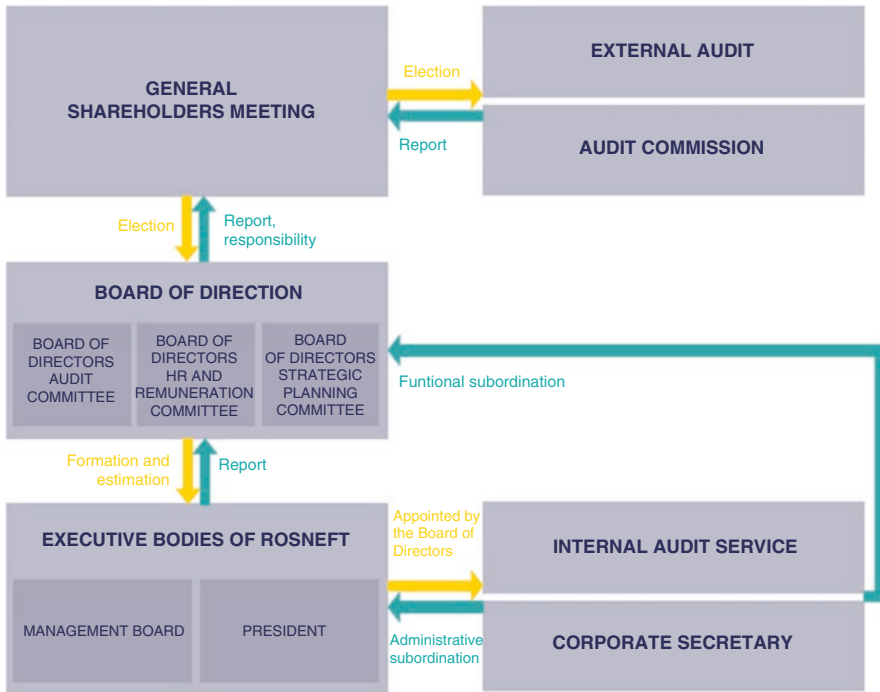
Definitions: Mkt. cap, market capitalization, calculated as share price X No of shares in issue; EV, enterprise value, calculated as market capitalization plus debt, minority interest, and preferred shares minus total cash and cash equivalent; EV/reserves, enterprise value/total proved reserves; EV/production, enterprise value/total annual oil and gas production; PE ration, price/earnings ratio, calculated as price per share/earnings per share

In parallel with the above improvement in Rosneft's valuation metrics, the company appears to be taking steps to reduce government influence and has improved corporate governance and transparency measures and has clearly set out as a system of relations between the executive bodies, the Board of Directors and stakeholders, with the aim of:

- Exercising of shareholders and investors rights
- Increasing the company's investments
- Creating viable mechanism of risk assessment, capable of influencing the company's value
- Ensuring efficient use and safety of funds contributed by shareholders

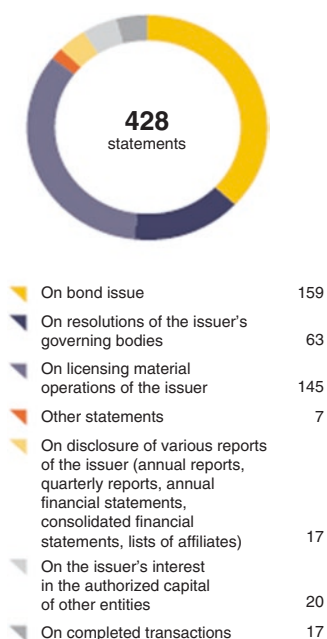
According to Rosneft, the current corporate governance model provides for separate functions of strategic leadership, control, and operating management of the company and is illustrated below (Fig. 4.11).

Fig. 4.11 Rosneft corporate governance model



Source: Rosneft Annual Report, 2015, p. 110

A tangible and strategic development has been the gradual decrease in state influence on Rosneft’s board, combined with the company’s transparency, where according to Rosneft, a total of 428 disclosure statements were made in 2016, illustrated in Fig. 4.12, and holding presentations of its financial results in accordance with IFRS (International Financial Reporting Standards), something that a privatized Aramco has to be able to produce.

Fig. 4.12 Rosneft statements disclosed in 2016

Source: Rosneft Annual Report, 2016, p. 231

The reduction in the level of state influence and the presence of independent Directors started under former Russian President Dimitri Medvedev in March 2011, when he ordered that all government representatives should leave the boards of state-owned companies. However, the 2016 Rosneft's Board of Directors still has some senior political relations to the state as noted below (Table 4.7).

Table 4.7 Rosneft's Board of Directors, 2016

Name	Function	Affiliation/background
Andre Belousov	Chairman	<ul style="list-style-type: none"> Assistant to the President of the Russian Federation since 2013 Former Director of Economics and Finance, Prime Minister's Office
Igor Sechin	Deputy Chairman and Chairman of Management Board	<ul style="list-style-type: none"> Former Deputy Head of the Executive Office of the President of the Russian Federation, Deputy Prime Minister of Russian Federation 2008–2012
Alexander Novak	Board Member, Strategic Planning Committee Member	<ul style="list-style-type: none"> Minister of Energy from 2012
Robert Dudley	Board Member, Strategic Planning Committee Member	<ul style="list-style-type: none"> CEO of BP Group PLC
GuilLermo Quintero	Board Member, Member of HR and Remuneration Committee	<ul style="list-style-type: none"> Regional President, BP Latin America

(continued)

Table 4.7 (continued)

Name	Function	Affiliation/background
Donald Humphreys	<i>Independent Director</i> , Chairman, Audit Committee	<ul style="list-style-type: none"> Former Exxon Mobil Executive Financial Operations
Albert Akimov	Board Member, Member of HR and Remuneration, Strategic Planning Committee	<ul style="list-style-type: none"> Chairman of the Management Board of JSC Gazprom Bank since 2003
Mathias Warnig	Deputy Chairman of Board of Directors, Chair of HR and Remuneration, Member of Audit Committee	<ul style="list-style-type: none"> Managing Director of Nord-Stream AG since 2006 Former Senior Executive Dresdner Bank
Oleg Viyugin	Chairman of Strategic Planning Committee, Member of Audit Committee	<ul style="list-style-type: none"> Professor at Finance Dept. of State University Higher School of Economics Chief Advisor for Russia to Morgan Stanley Bank until 2015.

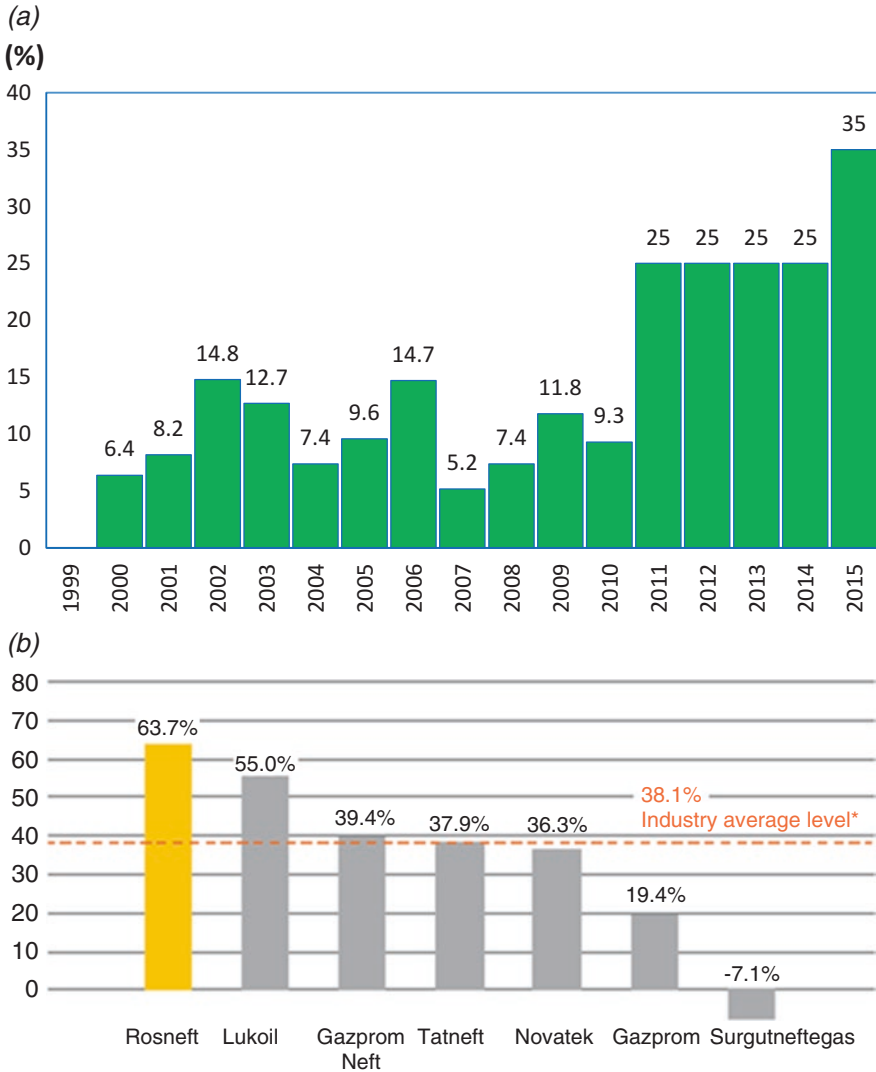
Source: Rosneft Annual Report, 2016

From the above board composition, six members are not affiliated with Russian government positions (Dudley, Quintero, Humphries, Akimov, Warnig, and Viyugin), while three are (Belousov, Sachin, and Novak), but it is noteworthy to note that both the Chairman and Deputy Chairman (Belousov and Sachin) are not represented on any of the board committees. This is an interesting board membership composition and of delegated responsibility and could be a template for Saudi Aramco for discussion in the next chapter.

According to Rosneft, the fixed amount of base remuneration of Board Members is US \$500,000 for a fiscal year, and in addition Board Members receive separate payments for serving on the various board committees ranging from \$30,000 as a member to \$50,000 for chairmanship of such committees. Total board compensation paid for 2015 was \$3,990,000, while the executive management was paid ruble 2.88 bn (\$39.4 million).

Rosneft has gradually increased its dividend payout to shareholders as illustrated in Fig. 4.13a, reaching a 35% payout ratio in 2015, while Fig. 4.13b sets out total shareholder return of Rosneft and comparable Russian companies in 2016.

Fig. 4.13 (a) Rosneft dividend history 1999–2015 (payout ratio IFRS/US GAAP) %. (b) Total shareholders return of Rosneft and comparable Russian companies in 2016 (%)



Source: Rosneft Annual Report (2015, p. 151; 2016, p. 226)

The dividend payout for 2015 was ruble 124.5 billion, paid in April 2016, equivalent to \$11.7 bn at the ruble/dollar 73 exchange rate for year-end 2015. The company has also decided to make a 35% dividend payment for 2016 (Rosneft 2017; Foy 2017). Applying a dividend payout policy that is acceptable to both the majority

government shareholder and private shareholders is important for all partly privatized NOCs, as will be explored for Aramco in the next chapter, as this is an important signal of intent and increased company investment appeal. In the case of Rosneft, the company's dividend policy is built upon the following principles:

- *Compliance with the laws of the Russian Federation and the company's charter*
- *Maintaining the balance of short- and long-term interest of shareholders*
- *Ensuring shareholder's commitment in improving the company's profitability*
- *Ensuring sustainable dividend growth given net profit increase*
- *Providing shareholders with the most convenient way to receive dividends*
- *Payment of dividends in the shortest possible time*

The above principles and steadily improved dividend payouts and other financial matrices have ensured that Rosneft obtained an investment grade credit rating of BB+ from S&P and Ba1 from Moody's, on par with the sovereign credit rating of the Russian Federation. The positive results have made Rosneft surpass its Russian peers as illustrated in Fig. 4.13b with a 63% shareholder return compared with an industry average of 38% and its nearest rival Lukoil at 55%. From being the least profitable company in Russia, Rosneft has been positively transformed by its partial privatization.

Norway's Statoil

The company started its life in 1972 as the *Den Norske Stats Oljeselskap AS*, as a state corporation. In 2001 the company changed its name to *Statoil ASA* and is listed on the Oslo and New York Stock Exchanges. Today Statoil has operations in 25 countries in Europe, Africa, Asia, and the Americas, and the company is involved in all areas of the petroleum business, from exploration and production to refining and distribution. Statoil has had a somewhat checkered history, plagued by a corruption scandal which forced both its CEO and Chairman to resign, prompting some fundamental governance and oversight within the company (Wolf and Pollitt 2009). Compared with the other NOCs analyzed in this chapter, Statoil today is the only partly privatized NOC to have not only one but *three* investor-related reports, namely, an audited annual report, a separate "statutory report" in accordance with Norwegian regulatory requirements, and a "board statement on corporate governance" report which sets out and reconfirms individual Board Members' joint and separate legal and oversight responsibilities and clearly sets out issues of risk, remuneration, salary scales, and board duties in very great detail, as well as the financial results (Statoil 2016a). Few, if any other NOCs, let alone international oil companies (IOCs), produce such a diverse and transparent list of reports, and Statoil has set a high bar for other NOCs that are considering partial or full privatization.

Norwegian political considerations have played an important role in Statoil's early policy directions (Noreng 1980). On its formation, it was clear that Norwegian state policy reflected the view that strategic resources such as oil and gas could not

be left to the multinationals, and the state had to have guaranteed access to these resources, and the Norwegian Labor Party, which governed the country from 1964 to 1981, increased Statoil's control over domestic oil production. Unlike other NOCs analyzed in this chapter, the Norwegian government decided to set ceilings on the production rate, not because of some collective producer agreements, and not to deplete its oil resources but to keep the impact of the new industry on the overall economy at a manageable level, since it recognized the potential for social and economic dislocation (Thurber and Istad 2010). This is a paradoxical situation, whereby other NOCs, especially those owned by countries dependent on resource revenues, are mandated to try and maximize production, *which creates a situation of dependency on such income and makes economic diversification away from hydrocarbon resources more difficult later on.*

By 1985, Statoil had established itself as the largest industrial company in Norway, accounting for as much as 10% of gross national product, and a similar proportion of government revenue, and began to look abroad for acquisitions as well as markets in the face of mergers and acquisitions of the major IOC players, deregulation of European markets, and the maturation of oil fields in the Norwegian shelf. Privatization and exposing Statoil fully to market challenges seemed to be a core option (Wolf and Pollitt 2009; Thurber and Istad 2010; Share 2000). On 18 June 2001, shares of Statoil were listed on the Oslo Stock Exchange and the New York Stock Exchange with a 19% stake in the company sold for \$16 bn, and the state's interest reduced to 70% in 2005 via a second share sale; this gradually fell to 67% by 2006 (Statoil 2001, IPO Prospectus). In 2003 the company found itself embroiled in a major corruption scandal with Statoil accused of paying off Iranian Consultants to help secure business deals in Iran, paying the Iranian consultancy firm Horton Investment \$15.2 million, with the consultancy having ties to the National Iranian Oil Company (NIOC). As a result both Statoil Chairman Leif Loeddesoel and CEO Olav Fjell resigned, and Ernst & Young was hired to review all Statoil's international consultancy contracts (Wolf and Pollitt 2009).

Statoil moved quickly to put this issue behind and started its internationalization process with key elements. The first was to allow Statoil to diversify away from what was perceived as an increasingly mature *Norwegian continental shelf (NCS)*, the second to allow a greater exposure to international operating and governance standards against which the company could benchmark its performance, and finally to reinforce the identity of Statoil as a company separate from the Norwegian state (Al-Kasim 2006; Claes 2002).

Statoil's current corporate strategy revolves around the following four goals:

- (a) ***Deepen and prolong Statoil's NCS position:*** *For more than 40 years, Statoil has explored, developed, and produced oil and gas from the Norwegian continental shelf (NCS) and the company plans to improve the reliability and life span of fields already in operation.*
- (b) ***Grow material and profitable international positions:*** *International oil and gas production represents approximately 37% of Statoil's equity production, and the company will continue to explore, develop, and produce oil and gas opportunities outside Norway to enhance Statoil's upstream portfolio.*

- (c) **Pursue focused and value-adding mid- and downstream activities:** *The aim is to process and transport Statoil's and gas production (including Norwegian state's petroleum) competitively to premium markets while securing maximum value realization.*
- (d) **Provide energy for a low-carbon future:** *Statoil recognizes the opportunities available in producing low carbon energy, and in 2015 the company created a new business area called "new energy solutions" to access, develop, and produce low carbon energy.*

In addition to the above goals, Statoil is placing a high degree of emphasis on R&D, with the company researching, developing, and deploying technology to create opportunities to enhance the value of Statoil's current and future assets (Statoil, Annual Report, 2015, pp. 10–12). The company has been very successful in increasing the average recovery rate from its fields on the Norwegian continental shelf to around 70% by 2016, a significant improvement on the 50% average recovery rate in 2012 and the target of 60% set in that year (Mainwaring 2012; Statoil 2017). The increased efficiency has been driven by the part privatized shareholders and is one of the benefits of listing NOCs which Aramco can also build upon following its own IPO.

As noted earlier, Statoil has expanded its production activities worldwide, and Table 4.8 sets out the production level per geographic region in 2016.

Table 4.8 Statoil global production levels by geographic area, 2016 (million boe/day)

Production area	Oil and NGL mboe/day	Natural gas mmcm/day	mboe/day
<i>Americas</i>	189	18	299
<i>Africa</i>	203	5	232
<i>Eurasia</i>	32	3	50
<i>Equity accounted production</i>	10	–	10
Total	435	25	592

Source: Statoil Annual Report, 2016, p. 27

Analyzing the above Statoil geographical footprint, the North American and sub-Saharan presence are major ones. Statoil has had strong growth in production within US shale since entering the first play in 2008, which sets Statoil apart from the other three NOCs analyzed in this chapter, as well as Aramco, which has not yet participated in US shale production. Statoil entered the *Bakken* in 2011 and *Eagle Ford* Shale formation in 2010. The company's partnerships have been with US shale operators like Brigham Exploration Company in *Bakken*, Chesapeake Energy Corporation in the *Marcellus* Shale gas play, and Enduring Resources and Talisman Energy in the *Eagle Ford* shale formations. In Canada, Statoil entered the Alberta Oil Sands in 2007 through a corporate acquisition of North American Oil Sands Corporation.

In South America, Statoil holds a 60% ownership interest in the *Peregrino* heavy oil field in the *Campos Basin*, while in sub-Saharan Africa, Statoil has made significant inroads in Angola with stakes in deepwater blocks 17, 15, and 31 which con-

tributed around 40% of Statoil's equity liquid production outside Norway in 2016. In Nigeria, Statoil has a 20.2% interest in the *Agbami* deep water field. In the European and Asian sphere, the most important production site is in Azerbaijan's oil fields in the Caspian Sea. Table 4.9 summarizes Statoil's significant subsidiary equity ownership, with the overwhelming majority being 100% owned by Statoil.

Table 4.9 Statoil's ownership in certain subsidiaries and other equity accounted companies (%)

Name	In %	Country of incorporation	Name	In %	Country of incorporation
Statholding AS	100	Norway	Statoil Nigeria Deep Water AS	100	Norway
Statoil Angola Block 15 AS	100	Norway	Statoil Nigeria Outer Shelf AS	100	Norway
Statoil Angola Block 15/06 Award AS	100	Norway	Statoil Norsk LNG AS	100	Norway
Statoil Angola Block 17 AS	100	Norway	Statoil North Africa Gas AS	100	Norway
Statoil Angola Block 31 AS	100	Norway	Statoil North Africa Oil AS	100	Norway
Statoil Angola Block 38 AS	100	Norway	Statoil Orient AG	100	Switzerland
Statoil Angola Block 39 AS	100	Norway	Statoil OTS AB	100	Sweden
Statoil Angola Block 40 AS	100	Norway	Statoil Petroleum AS	100	Norway
Statoil Apsheron AS	100	Norway	Statoil Refining Norway AS	100	Norway
Statoil Azerbaijan AS	100	Norway	Statoil Shah Deniz AS	100	Norway
Statoil BTC Finance AS	100	Norway	Statoil Sincor AS	100	Norway
Statoil Coordination Center NV	100	Belgium	Statoil SP Gas AS	100	Norway
Statoil Denmark AS	100	Denmark	Statoil Tanzania AS	100	Norway
Statoil Deutschland GmbH	100	Germany	Statoil Technology Invest AS	100	Norway
Statoil do Brasil Ltda	100	Brazil	Statoil UK Ltd	100	UK
Statoil Exploration Ireland Ltd.	100	Ireland	Statoil Venezuela AS	100	Norway
Statoil Forsikring AS	100	Norway	Statoil Metanol ANS	82	Norway
Statoil Færøyene AS	100	Norway	Mongstad Terminal DA	65	Norway
Statoil Hassi Mouina AS	100	Norway	Tjeldbergodden Luftgassfabrikk DA	51	Norway
Statoil Indonesia Karama AS	100	Norway	Naturkraft AS	50	Norway
Statoil New Energy AS	100	Norway	Vestprosess DA	34	Norway
Statoil Nigeria AS	100	Norway	Lundin Petroleum AB	20	Sweden

Source: Statoil Annual Report 2016, p. 39

Besides international production, Statoil has other operating segments in energy solutions and technology development, as set out below:

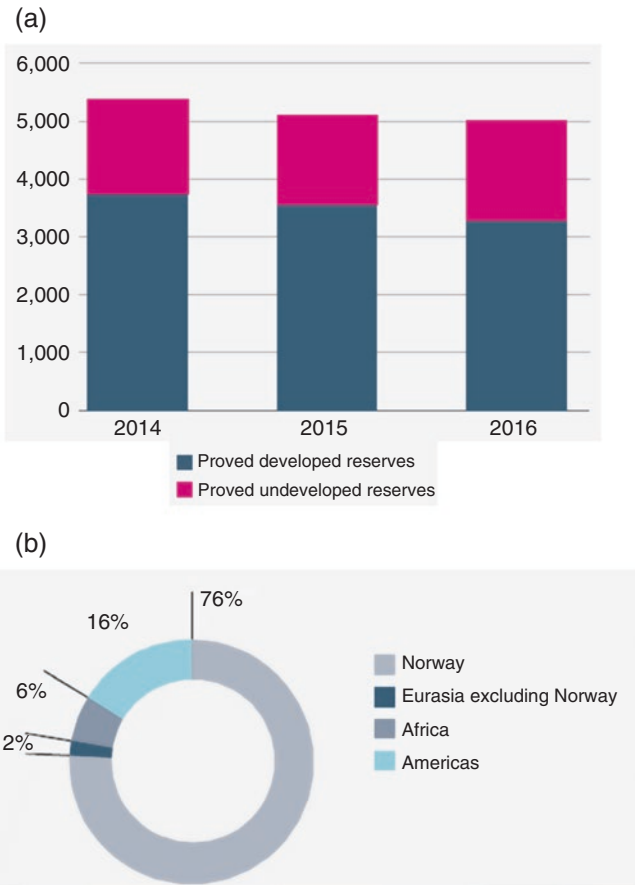
- *New energy solutions (NES)*: This business segment reflects Statoil's ambition to complement its oil and gas portfolio with profitable renewable energy and other low-carbon solutions, with offshore wind and carbon capture and storage (CCS) a key focus in 2015.
- *Technology, project, and drilling (TPD)*: This business segment is responsible for delivering projects and wells, and in providing global support on standards and procurement, as well as responsible for developing Statoil as a world-class technology company. Research development and innovation are organized in several research programs: exploration, mature area development, and improved oil recovery, frontier development, and unconventional. Statoil has four research centers in Norway with world-leading laboratories, as well as operations in Brazil, the USA, Canada, and China. (These activities and international R&D outreach are very reminiscent of Saudi Aramco's own R&D strategy.)

Similar to the audits done for Rosneft's reserves, Statoil carries out its reserve audit through DeGolyer and MacNaughton, and Statoil's proved reserves are estimated and presented in accordance with US Securities and Exchange Commission rules. According to the company, approximately 89% of "proved" reserves are located in OECD (Organization for Economic Cooperation and Development) countries, with Norway being the most important contributor in this category. Statoil has provided definitions for the reserve data it publishes, whereby:

- *Proved reserves*: Changes to these are most commonly the result of revisions of estimates due to observed production performance, extension of proved areas through drilling activities, or the inclusion of proved reserves in new discoveries, whereby these are the sources of *additions* to prove reserves that are the result of continuous business processes and can be expected to continue to add reserves in the future. Changes in proved reserves *can also be due to factors outside management control, such as changes in oil and gas prices which normally allow less oil and gas to be recovered from the accumulation.*
- *Proved undeveloped reserves*: Undrilled well locations onshore are generally booked as proved undeveloped reserves, when a development plan has been adopted and the well locations are scheduled to be drilled within 5 years (Statoil, Annual Report, 2015, p. 48).

Figure 4.14 illustrates Statoil's proved reserves as well as by geographical distribution.

Fig. 4.14 Statoil reserves. (a) Proved reserves (developed and undeveloped) 2014–2016 (million boe). (b) Distribution of proved reserves (2016)



Source: Statoil Annual Report, 2016, p. 41

Statoil has also provided a breakdown of its reserves by different geographical regions in Fig. 4.15.

Fig. 4.15 Statoil proved reserves by region (million boe) 2016. (a) Norway. (b) Eurasia excluding Norway. (c) Africa. (d) Americas



Source: Statoil Annual Report 2016, pp. 42, 43

According to Statoil, the sharp fall in proved but undeveloped reserves for Eurasia (excluding Norway), and for the Americas in 2016, was due to negative revisions linked to lower commodity prices, resulting in earlier economic cut-offs primarily in the *Mariner* field in the UK which is under development and is expected to start production in 2018. The fall in the US reserves was also due to negative revisions linked to lower commodity prices, resulting in undeveloped well locations onshore, the USA becoming uneconomic. The application of stringent reserve estimations by Statoil has ensured that the company's own reserve estimates are generally in line with third-party independent audits as noted in Table 4.10, where Statoil's estimates and DeGolyer and MacNaughton's estimates are set out for 2016.

Table 4.10 Statoil and DeGolyer and MacNaughton net proved reserve estimates at 31 December 2016

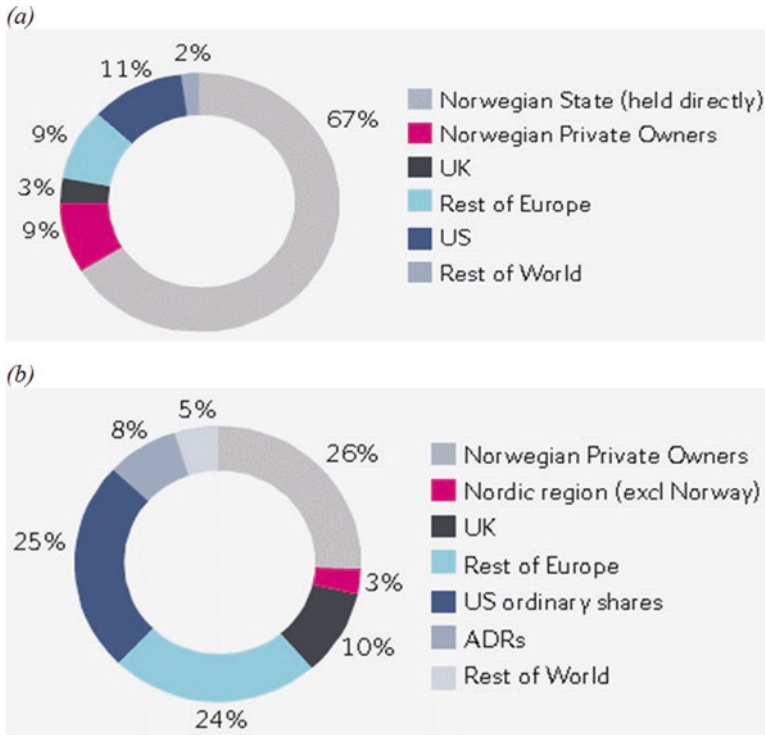
Net proved reserves as at 31 Dec. 2016	Oil and condensate	NGL/LPG (mmbbl)	Sales gas (bcf)	Oil equivalent (mmboe)
• Estimated by Statoil	2033	372	14,637	5013
• Estimated by DeGolyer and MacNaughton	2244	324	13,685	5007
• Statoil deviation (%) from DeGolyer and MacNaughton estimates	(9.4%)	+14.8%	+6.9%	+0.12%

Source: Statoil Annual Report 2016, p. 46

As the above table indicates, Statoil's estimated deviation from DeGolyer & MacNaughton was an overall negligible 0.12%, with conservative underestimations applied, except for gas sales.

The company's conservatism has been guided by a clear corporate governance structure and a Board of Directors that are mostly composed of independent members, as will be discussed later, despite the fact that the Norwegian state plays a significant role in setting the country's petroleum and licensing laws. The principal laws governing Statoil's petroleum activities in Norway are the "Norwegian Petroleum Act" and the "Norwegian Petroleum Taxation Act." Under the first act, the Norwegian Ministry of Petroleum and Energy is responsible for resource management and for administering petroleum activities in the Norwegian continental shelf (NCS). The main task of the Ministry is to ensure that petroleum activities are conducted in accordance with the applicable legislation and the policies adopted by the Norwegian parliament or the *Storting*, and decisions of the state. The Norwegian state's policy as a majority shareholder in Statoil has been consistent: to ensure that petroleum activities create the highest possible value for the Norwegian state (Statoil 2016b). Besides this objective, there is a specific mandate, *whereby Statoil markets and sells the Norwegian state's oil and gas together with the company's own production*, and in this respect risks related to state ownership arise, something that has been highlighted earlier in this chapter. For Statoil, the interests of the majority shareholder, the Norwegian state, may not always be aligned with the interest of Statoil's other shareholders, and this may affect Statoil's policy decisions. Figure 4.16 sets out Statoil's shareholding structure at year-end 2016.

Fig. 4.16 Statoil shareholding as at 31 December 2016 (%). (a) Distribution of shareholders. (b) Free float breakdown



Source: Statoil Annual Report, 2016, p. 242

In order to create a single NOC, the Norwegian government merged the country's other NOC *Norsk Hydro* in 2007, to form *Statoil Hydro*, and the state's ownership interest in the merged company was 62.5% (Thurber and Istad 2010). However, in accordance with the Norwegian parliament's decision of 2001 concerning a minimum state shareholding in Statoil of two-thirds, the Norwegian government built up the state's ownership by buying shares in the open market, and in 2009 the Norwegian government announced that the state's direct ownership interest had reached 67% as illustrated in Fig. 4.16a, while Fig. 4.16b sets out the free float shareholders, with the USA holding 25% in ordinary shares and 8% in ADRs or American depository receipts. Statoil has attracted a very diverse range of stakeholders drawn from some of the world's top asset management companies and listed in Table 4.11.

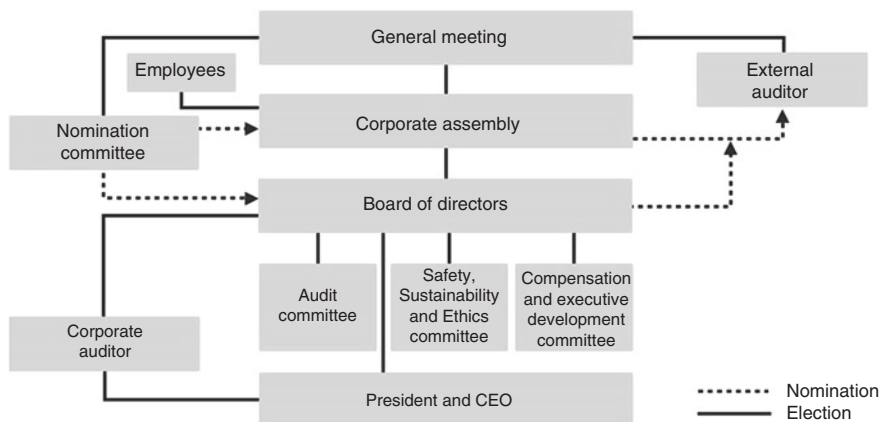
Table 4.11 Statoil major institutional shareholders as of year-end 2016

Shareholders at December 2015	Number of shares	Ownership in %
1. Government of Norway	2,174,183,105	67.00%
2. Folketrygdfondet	104,403,441	3.22%
3. BlackRock Institutional Trust Company, N.A.	29,242,733	0.90%
4. Lazard Asset Management, L.L.C.	28,711,525	0.88%
5. SAFE Investment Company Limited	24,698,519	0.76%
6. INVESCO Asset Management Limited	22,281,500	0.69%
7. Fidelity Management & Research Company	21,301,248	0.68%
8. The Vanguard Group, Inc.	21,120,974	0.65%
9. State Street Global Advisors (US)	18,293,972	0.61%
10. Schroder Investment Management Ltd. (SIM)	19,493,851	0.60%
11. Storebrand Kapitalforvaltning AS	17,611,950	0.54%
12. KLP Forsikring	16,761,633	0.52%
13. DNB Asset Management AS	16,032,525	0.49%
14. UBS Asset Management (UK) Ltd.	12,890,335	0.40%
15. Fidelity Worldwide Investment (UK) Ltd.	11,731,543	0.36%
16. TIAA Global Asset Management	11,413,046	0.35%
17. Allianz Global Investors GmbH	11,397,417	0.35%
18. Epoch Investment Partners, Inc.	11,194,404	0.35%
19. Legal & General Investment Management Ltd.	10,152,188	0.31%
20. AXA Investment Managers UK Ltd.	9,304,532	0.29%

Source: Statoil Annual Report, 2016, p. 243

As noted earlier, a majority ownership in Statoil by the Norwegian state creates potential risk. If the Norwegian state's coordinated ownership strategy is not implemented and pursued in the future, then Statoil's mandate to continue selling the state's oil and gas, together with its own oil and gas as a single economic unit, is likely to be put at risk and would have an adverse effect on Statoil's position in the market in which it operates. Statoil also faces indirect impact through legislation such as tax and environmental laws and licenses for exploration, production, and approval for development projects. Furthermore, if important public interest is at stake, the government may also instruct the company to reduce petroleum production should it deem it necessary as a party to a global production agreement, like the OPEC and non-OPEC production agreement which Rosneft was part of as noted earlier in the chapter. To this end, Statoil's corporate governance structure and the composition of its Board of Directors to ensure there are some checks and balances to protect all shareholders become important (Lipman 2006; Heath 1997; Claes 2002). This is discussed next.

To ensure sound corporate practice, Statoil's organization is structured and managed in accordance with the Norwegian Code of Practice for Corporate Governance, drawing upon best practice for resource-based organizational governance (Leblein 2003). Figure 4.17 sets out Statoil's governance structure.

Fig. 4.17 Statoil corporate governance

Source: Statoil statutory report, 2015, p. 20, Statoil (2016c)

The above diagram highlights the significant role played by Statoil's employees in the nomination and election of Board Members at the Corporate General Assembly meetings, with three Board Members elected by employees out of a total ten board membership, as discussed below. The company President and CEO has the overall responsibility for day-to-day operations in Statoil, and he appoints the Corporate Executive Committee (CEC), who has a collective duty to safeguard and promote Statoil's corporate interest, with each of the CEC Members as head of a separate business area or staff function. As of 2016, the President and CEO was Mr. Eldar Saetre, who joined Statoil in 1980, and the Chief Financial Officer was Hans Hegge who joined Statoil in 1995. The Chief Operating Officer was Anders Opedal who joined Statoil in 1997 and previously held senior positions with Schlumberger and Baker Hughes. None of the above Senior Executives had family relations to other CEC Members but held shares in the company. It was particularly interesting to note that, unlike Rosneft or the other NOCs analyzed, *Statoil places great public emphasis on ensuring that senior management do not have family relations to other members of the CEC Members, Members of the Board, or the Corporate Assembly* (Statoil 2016a).

Pursuant to Statoil's Articles of Association, the Board of Directors consists of between 9 and 11 members, and senior management is not represented on the board, unlike Aramco where the CEO Mr. Amin Nasser is a Board Member. As of 2016, Statoil's Board of Directors consists of ten members, and as required by Norwegian law, the company's employees are entitled to be represented by three Board Members. With the exception of four Board Members, all the others are considered independent, which along with the fact that five members are female makes *Statoil's Board of Directors not only the most independent of the partially privatized NOCs but also the most gender diverse*. Table 4.12 summarizes Statoil's Board Members as of 2015.

Table 4.12 Statoil Board Members (December 2016)

Name	Function	Affiliation/background
Oystein Loseth	<ul style="list-style-type: none"> Chairman Chair of the Compensation and Executive Committees Independent 	<ul style="list-style-type: none"> Shareholder elected Chairman 2010–2014 CEO of Vattenfall AB Senior positions with NUON and Statkraft
Roy Franklin	<ul style="list-style-type: none"> Deputy Chairman Chair of Safety, Sustainability, and Ethics Committees and Member of Audit Committee Independent 	<ul style="list-style-type: none"> Shareholder elected Now Executive Director of Keller Group PLC, UK, and Cuadrilla Resources Holdings Ltd. Board Member of Santos Ltd. and Kerogen Capital and Amec Foster Wheeler
Bjorn Godal	<ul style="list-style-type: none"> Member of the Board and Compensation, Executive Development, Ethics, and Sustainability Committees Independent 	<ul style="list-style-type: none"> Shareholder elected Former member of Norwegian parliament, Norway's Ambassador to Germany and academic
Jeroen van der Veer	<ul style="list-style-type: none"> Chair of Audit Committee Independent 	<ul style="list-style-type: none"> Shareholder elected member Chair of the supervisory boards of ING Bank NV, Royal Phillips Electronics, Technical University of Delft Chair of Advisory Board of Rotterdam Climate Initiative and Board Member of Boskalis Westminster Group and Het Concertgebouw
Ms. Maria Oudeman	<ul style="list-style-type: none"> Member of Compensation and Executive Development Committee Independent 	<ul style="list-style-type: none"> Shareholder elected member President of Utrecht University, Holland Exec. Member of AKZO Nobel and Executive Director at Corus Group
Ms. Rebekka Herlofsen	<ul style="list-style-type: none"> Member of Audit Committee Independent 	<ul style="list-style-type: none"> Shareholder elected member CFO, Torvald Klaveness Shipping, and Former Executive at Euskilda Securities, and BW Group
Ms. Wenche Agerup	<ul style="list-style-type: none"> Member of Compensation, Executive Development and Safety, sustainability, and Ethics Committee Not independent 	<ul style="list-style-type: none"> Shareholder elected member Former member of Norsk Hydro
Ms. Lilli-Heidi Bakkerud	<ul style="list-style-type: none"> Member of Safety, Sustainability, and Ethics Committee Not independent 	<ul style="list-style-type: none"> Employee – elected member Exec. Member of Industry Energy Trade Union
Ms. Ingrid de Valerio	<ul style="list-style-type: none"> Member of Audit Committee Not independent 	<ul style="list-style-type: none"> Employee elected member Works at Statoil since 2005 Former union representative of Tekna
Stig Legreid	<ul style="list-style-type: none"> Member of Safety, Sustainability, and Ethics Committees Not independent 	<ul style="list-style-type: none"> Employee elected member Employed in ASV and Norsk Hydro since 1985 Full-time employee representative as leader of NITO Statoil Union

Source: Statoil Annual Report 2016, pp. 91–95

To ensure that the 2003 bribery corruption scandal involving payments to Iranian intermediaries is not repeated, both the Chief Executive Officer and the full Board of Directors of Statoil have now to make a signed board statement on reporting of payments to foreign governments in accordance with the Norwegian Securities Trading Act (Statoil Statutory Report, 2015, p. 21). This further differentiates Statoil from other NOCs and places it on par with international oil companies subject to foreign corruption act payments. Statoil also reports in a very detailed and transparent manner full compensation payments made to the Board of Directors, the Corporate Executive Committee, and the Corporate Assembly, with the Statoil board receiving 5.95 million Norwegian Kroner (NOK) (\$672,000) in 2015 and the members of the Corporate Executive Committee receiving NOK 87.1 million (\$9.83 million) (Statoil Annual Report, 2015, pp. 130–131).

Statoil is subject to ordinary Norwegian corporate income tax and to a special petroleum tax relating to its offshore activities in Norway. In addition, there are taxes on both carbon dioxide emissions and emissions of nitrogen oxide (NO_x) which sets Statoil apart from the other NOCs assessed in this chapter. The Norwegian standard rate of corporate income tax was reduced from 27% in 2015 to 25% in 2016, and the maximum rate of depreciation of development costs relating to offshore production installations and pipelines is 16.7% per year, and any tax losses can be carried forward indefinitely against subsequent income earned. A special petroleum tax is levied on profits from petroleum production and pipeline transportation on the Norwegian continental shelf, and this was increased from 51% in 2015 to 53% in 2016. The special petroleum tax rate is applied to relevant income in addition to the standard income tax rate, resulting in a 78% marginal tax rate on income subject to the special petroleum tax. Taxation levels outside Norway are subject to tax regimes pursuant local legislation (Statoil Annual Report, 2015). The planned Aramco IPO royalty payment and tax regime as announced in 2017, of a 20% royalty and a 50% tax rate, seem to be in line with Statoil's tax regime.

Statoil prepares its consolidated financial statements in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union and as issued by the International Accounting Standards Board, and the Annual Report is produced *on Form 20-F* subject to the requirements of the US Securities Exchange Act of 1934 (Statoil Annual Report, 2016, p. 6). Table 4.13 summarizes key financial results for the company for the period 2013–2016.

Table 4.13 Statoil: key financial indicators 2013–2016 (\$ million)

Indicators	2016	2015	2014	2013
• Net income	(2902)	(5169)	3887	6713
• Noncurrent finance debt	27,999	29,965	27,593	27,197
• Total assets	104,530	109,742	132,702	145,572
• ROACE	(4.7%)	(8.9%)	3.4%	11.3%
• Diluted earnings per share (NOK)	(0.91)	(1.63)	1.21	2.14
• Dividend per share (US\$)	0.88	1.07	0.97	1.15

Source: Statoil Annual Report, 2016, p. 9

The decrease in net revenue losses from 2015 to 2016 was mainly due to the significant rise in both oil and gas prices during 2016, resulting in a lower net income loss in 2016, affecting both total asset value and return on average capital employed (ROACE), which registered a negative return of 4.7% in 2016 compared with a positive 3.4% in 2014. This is still lower than the record payout level of 11.3% in 2013 when oil prices were higher, averaging at \$100 pb compared with \$40 pb for year-end 2016.

In 2014 Statoil implemented quarterly dividend payments, and from the second quarter of 2015, the company implemented the US dollar as dividend declaration currency. Despite net income losses in 2016, Statoil paid a dividend for that year compared to the high level of 2013 but noted that the company cannot give an assurance that future dividends will be paid or predict the amount of dividends as this will depend on a number of factors prevailing at the time the board considers dividend payments. This is something that a post-privatized Aramco has to bear in mind. Statoil's noncurrent finance debt decreased by \$1.9 bn over 2015 levels, with a weighted average annual interest rate of 1.90% in 2015, compared with 1.61% in 2014. The company's average maturity on finance debt was 9 years at 31 December 2016, compared to 9 years in 2015 and 10 years in 2014. During 2015, Statoil issued bonds with maturities from 4 to 20 years for a total amount of euro 3.75 billion, and these were swapped into US dollars, with all the bonds unconditionally guaranteed by Statoil Petroleum AS. According to the company's 2015 Annual Report (p. 80), the group's borrowing needs are usually covered through the issuance of short-, medium-, and long-term securities including utilization of a US Commercial Paper Program (limit \$4 billion) and a Shelf Registration Statement (unlimited) filed with the SEC in the USA as well as through issues under a euro Medium Term Note Program with a limit of euro 20 billion listed on the London Stock Exchange. The above compares with Saudi Aramco's initial \$10 bn *Sukuk* borrowing in 2017 and the steps taken by Aramco to ensure that it borrows under its own name and credit risk, as opposed to borrowing from the state.

One needs to better understand Statoil's different business segments performance to assess the variations in net income, as well as the total revenues generated by geographic area. These are illustrated in Table 4.14a and 4.14b.

Table 4.14a Statoil business segment performance by net operating income (\$ million) 2014–2016

Business segment-net operating income	2016	2015	2014
• Development and production Norway	4451	7161	17,753
• Development and production international	(4352)	(8729)	(2703)
• Marketing, midstream, and processing	623	2931	6234

Table 4.14b Statoil total revenues (\$ million) by geographic areas (2014–2016)

Geographic region	2016	2015	2014
• Norway	35.735	45.582	74.096
• USA	6.463	7.922	14.518
• Sweden	1.326	1.877	2.896
• Denmark	1.532	1.759	3.087
• Other	936	2.532	4.702

Source: Statoil Annual Report, 2016, pp. 19, 20

From Table 4.14a, Statoil's net operating income from oil and gas development and production has fluctuated, as also the marketing, midstream, and processing business segment despite the company's diversification into refined products. In terms of revenue generation by geographic areas, Norway is still the main revenue source with the USA also an important market, especially considering that Statoil is also involved in the US shale sector. The Statoil 2016 Annual Report also breaks down revenues by geographic region and by business line. In 2016 crude oil accounted for around 46% of total revenue, with gas at 20%, refined products at 17%, and NGL (natural gas liquids) at around 9%. In 2013, the share of these segments was 50%, 17%, 18%, and 10%, respectively (Statoil Annual Report, 2016). Having such a diversified business and operational base ensures that Statoil is protected, to a certain extent, in the face of erratic energy prices.

Brazil's Petrobras

Petrobras was incorporated in 1953 as the exclusive agent to conduct the Brazilian Federal Government's hydrocarbon activities but lost its exclusive right in 1997 to carry out oil and gas activities in Brazil when the Brazilian Congress amended the constitution as part of a comprehensive reform of the oil and gas regulatory system, which authorized the federal government to contract with any state or privately owned company (Kingstone 1999; Pelin 1997; Smith 1976). The new law of 1997 established a concession-based regulatory framework and created an independent regulatory agency, the ANP to oversee the energy sector. Following the discovery of large "pre-salt" reservoirs in offshore Brazil, the Federal Congress passed in 2010 additional laws to regulate exploration and production activities in the pre-salt area and other potentially strategic areas not already under concession (Petrobras 2016a, Report to the Administration). Over the decades, Petrobras has developed special expertise in deepwater exploration and production from developing Brazil's offshore basins and is now applying this technical expertise in developing the giant *Campos and Santos Basins*, with the latter expected to be the principal source of the company's future growth in proved reserves and oil production. As early as 1972, Petrobras, in line with what we have assessed so far for the other NOCs, decided that it needed to diversify its asset base internationally in order to increase its resource base and reduce Brazil's dependency on imported oil and to gain

international experience and expertise (Randall 1993). To this end, it established an international subsidiary, “*Bras Petro*,” and began the process of investment in joint ventures across the main hydrocarbon provinces in the world. This has resulted in an international business, which now covers nine countries in the exploration and production refining, distribution and gas and power sectors.

Besides the above strategic objective, Petrobras set itself other strategic goals (Petrobras 2015). These were:

- ***Become a global technical leader in deepwater oil field development to differentiate itself from Brazilian rivals especially since the 1997 decision to end Petrobras's monopoly over the domestic oil sector.***
- ***Become a participant in joint ventures with private companies, which not only encouraged Petrobras to focus on efficiency and profitability but also stimulated Petrobras's additional transfer of upstream and downstream technology from foreign partners such as Shell, BG, Repsol, Anadarko, and Chevron.***
- ***Expose Petrobras to the international investment community through listing on the New York Stock Exchange in 2000, which was the final step by the company having been partly privatized in 1992 with domestic shareholders offered 45% of the company, while the state retained 55%.***

As will be discussed later, the state now owns 64%, while 36% is owned by a combination of domestic and international institutions. This international exposure has brought with it a much greater need for transparency and good corporate governance and creation of shareholders value (Petrobras 2016b, Strategic Plan 2017–2021).

International listing was also an opportunity to source international capital inflow to develop Brazil's ultra-deep reserves, with an estimated \$215 bn of capital required, and a major part of the funding for this outlay has been provided by a \$70 bn equity share sale in 2010 (Financial Times 2010). Petrobras growth as an international company has not removed its obligation as Brazil's domestic NOC, and the company continues to play an important role in social programs as noted earlier for Rosneft, Statoil, and Aramco in the preceding chapter. Like Saudi Aramco, Petrobras places great emphasis on *local content* in all its field development, and the requirements for exploration phase contracts are for 37–55% local content and 55–65% in the development and production phase, somewhat lower figures compared with Aramco's 70% local content target.

As noted for the other analyzed NOCs, the need for Petrobras to support the Brazilian economy as the country's NOC also brought it the benefit of being the country's state representative in the oil sector. The discovery of vast new offshore, but difficult to exploit oil reserves, has caused the Brazilian government to rethink its model for corporate participation in the domestic oil sector and reinforced Petrobras as the “domestic champion” and allowed the company to remain the largest player despite increased competition (Tordo 2009).

This competitive concession regime has now been replaced by a *production sharing agreement regime, under which Petrobras will become the operator of every field in the pre-salt layers and will have a minimum of 30% stake, thus partially reintroducing the NOC monopoly model for new fields.* It is interesting to compare this with the Norwegian government's decision to have Statoil manage not only its

own production and marketing but also the state's other production output. In summary, the combined strategies of Petrobras and the Brazilian Federal Government have created a company that combines elements of NOC access and domestic focus, with a world-leading technological expertise in deepwater development, financial capital access, and exposure to international assets. How this has been leveraged to realize shareholder value is addressed next.

Governments often find it easy to justify ownership of the industrial enterprise, especially state oil and gas companies, whereas according to neoclassical economic theory, there are advantages in the private ownership of companies, except where there is market failure, aptly demonstrated during the 2008–2009 global financial crisis and which necessitated massive government bailouts at public expense. Some have argued that the energy sector commonly presents the conditions for market failure where there are externalities in consumption or production, the product is a public good, the market is monopolistic in structure, and information costs are high (Robert 1999; Megginson and Netter 2001). However, as noted earlier in the chapter, countries have liberalized their oil and gas industries, albeit on a partial privatization basis, with economic studies of privatization revealing that governments have a range of motivations in doing so (Lewis 2004a; Arocena and Oliveros 2012; Rodrik 2007). These are:

- *To raise revenue for the state*
- *To promote economic efficiency and increased profitability*
- *To reduce government interference in the economy*
- *To promote wider share ownership*
- *To provide the opportunity to introduce competition*
- *To develop national capital markets*

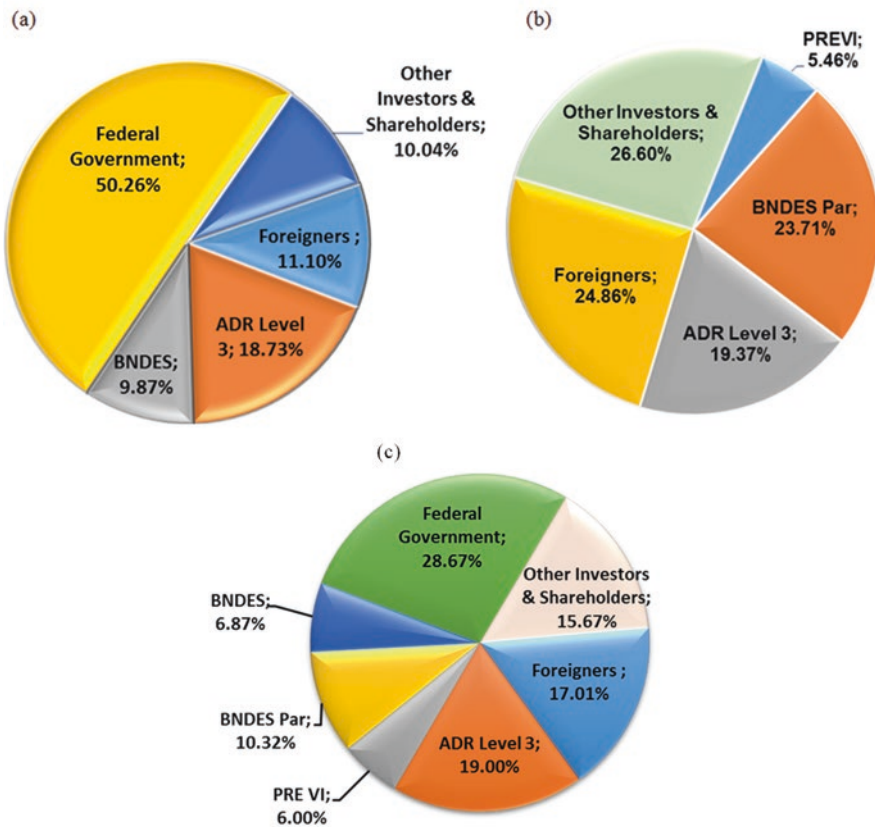
At the end of this chapter, we will compare the four NOCs against these matrices. Additionally, there can be consequences whereby privatization can also provide the opportunity to break up the business and state relations, thereby promoting democracy and the growth of civil society (Cardoso 2001). The assessment of the four NOCs has indicated that governments choose a variety of privatization methods according to a number of political, economic, and social factors facing the host government, which can include the following (Lewis 2004a, p. 11):

- *The history of the asset's ownership*
- *The financial and competitive position of the SOE*
- *The government's ideological view of markets and regulation*
- *The past, present, and future regulatory structure in the country*
- *The need to compensate important interest groups during privatization*
- *The government's ability to credibly commit itself to respect investors' property rights after divestiture*
- *The capital market conditions and existing institutional framework for corporate governance in the country*
- *The sophistication of potential investors*
- *The government's willingness to let foreigners own divested assets*

As noted from the earlier NOC's case studies, successful deregulation and privatization depend on the coordination of political and economic reforms, whereby on the political side stakeholders in the privatization process must be identified and compensated in such a way that they support reforms. Statoil's strong employee trade union structure and appointment of Board Members by employees is a case in point and addresses a question of: *will privatization work politically?* On the economic side, the NOC must undergo so-called corporatization and develop a strategic plan in order to flourish within a highly competitive international energy environment and addresses the question of *whether privatization will work economically.* As we have noted with Rosneft and Statoil, the economic results have been mixed in terms of dividend payout, leverage, and net profit.

Petrobras' ownership and shareholding structure as of 2016 are illustrated in Fig. 4.18.

Fig. 4.18 Petrobras. (a) Shareholding position, 31 December 2016, voting capital-common shares. (b) Nonvoting capital – preferred shares. (c) Capital stock



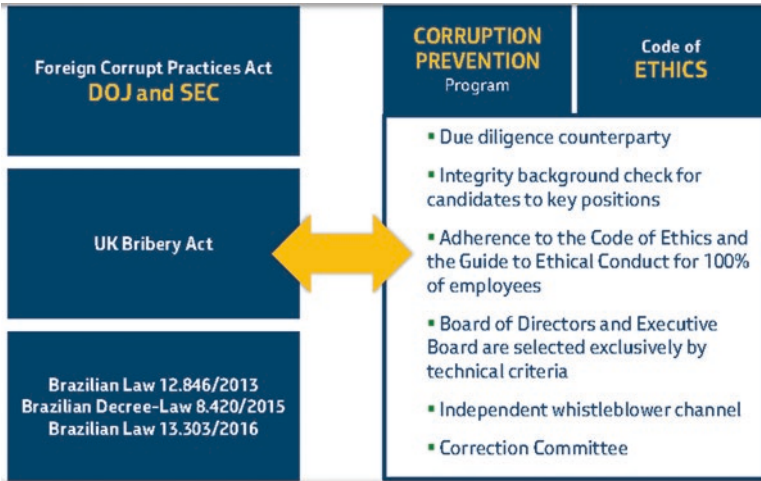
Source: Petrobras, Report to the Administration, 2016a, p. 10
 Note: PREVI Pension Fund for Banco de Brasil employees, BNDES Brazilian Development Bank, ADR American depository receipt

Brazilian law requires the federal government, as controlling shareholder, to hold the majority of Petrobras shares with voting rights as illustrated in Fig. 4.18a, thus holding power to elect the majority of members of the Board of Directors. In turn, the Board of Directors elects the company's executive officers.

Petrobras has issued two classes of shares listed on stock exchanges. These are common shares which grant voting rights to holders in Fig. 4.18a, and preferred shares, which do not grant voting rights but guarantee priority in the distribution of dividends. This model is not the structure analyzed for both Statoil and Rosneft. In Brazil, Petrobras shares are listed on the Sao Paulo Stock Exchange, and in the USA through the ADRs (American depository receipts), which are certificates issued by American banks that represent shares of a foreign company in the USA and are listed on the New York Stock Exchange. Besides the Brazilian Federal Government, other major shareholders are the Pension Fund for *Banco de Brasil* employees and BNDES, the Brazilian Development Bank. Foreign investors also hold Petrobras shares as Petrobras Common Stock and are listed in the Spanish and Argentine Stock Exchanges for both common and preferred stock. Foreign investors hold 39.9% of voting capital and 44.2% of nonvoting preferred shares. Of the foreign institutional investors, BlackRock Inc. of the USA holds approximately 5% of preferred shares (Petrobras 2017, Form 20-F SEC submission, p. 137).

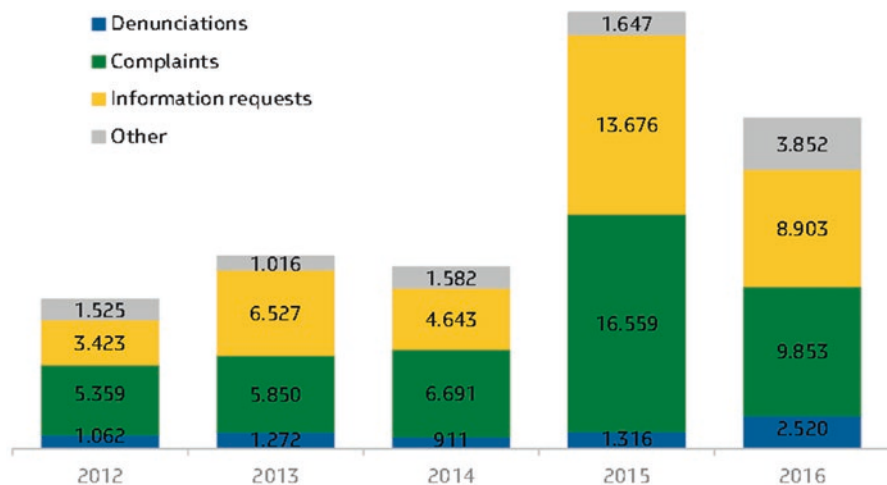
Just like Statoil was involved in a corruption scandal involving dealings with the National Iranian Company and came out of it stronger in terms of governance and internal controls, so too was Petrobras. In 2009, the Brazilian Federal Police began an investigation of the so-called *Lava Jato* (car wash) scandal aimed at criminal organizations engaged in money laundering in several Brazilian states, with some claiming that the scandal is the biggest corruption scandal in history (Watts 2017). Beginning in 2014, according to the company, the Brazilian Federal Prosecutor's Office focused part of its investigation on irregularities involving Petrobras contractors and suppliers and uncovered a broad payment scheme that involved a wide range of participants, including former Petrobras employees. According to information received by Petrobras, the payment scheme involved a group of companies that between 2004 and 2012 colluded to obtain contracts with Petrobras, overcharged the company, and used the overpayment received under the contracts to fund improper payments to political parties, elected officials, other public figures, and former Petrobras employees. Petrobras itself did not make any improper payments, but some former company employees were arrested and charged. Petrobras has not disclosed the amounts paid by the company related to contracts with contractors and suppliers involved in the payment scheme, and these were included in historical costs of its property, plant, and equipment (Petrobras, Report of the Administration, 2016a, pp. 10, 11). While Petrobras is pleading that it is the innocent party, the company has established measures to strengthen compliance as illustrated in Fig. 4.19.

Fig. 4.19 Petrobras internal anti-corruption compliance structure



Source: Petrobras Report of the Administration, p. 59

As part of the strengthening of the internal control structure, among the measures taken in 2016 were the approval of a new corporate compliance policy, performing training programs with all personnel on the prevention of corruption, conducting nearly 12,000 integrity due diligence procedures, and performing background checks as part of the decision making for appointing personnel to key positions. As the above figure illustrates, an independent “whistleblower channel” was established, called “*contato seguro*” or “safe contact,” with a guarantee of anonymity and the commitment not to retaliate against the whistleblower. As Fig. 4.20 illustrates, the results have been impressive in terms of demands received by the Ombudsman’s office.

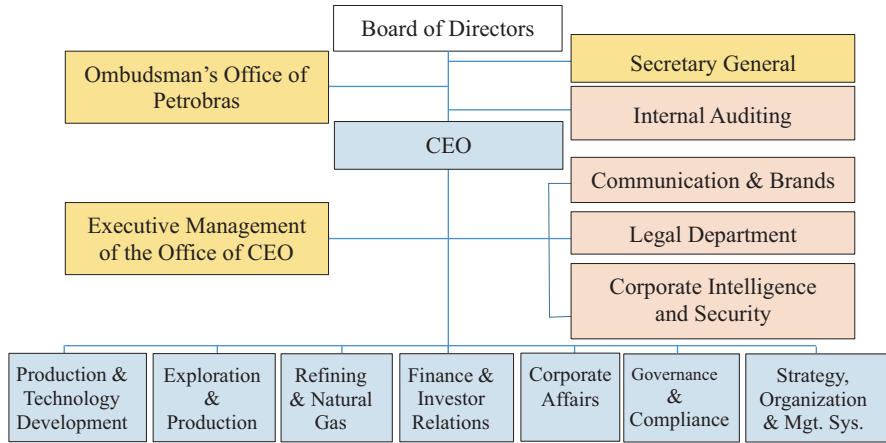
Fig. 4.20 Petrobras: demands received by the Ombudsman's office (2012–2016)

Source: Petrobras Report of the Administration, 2016a, p. 66

Further to the above measures, two independent firms were hired in October 2014 which report directly to a special committee that serves as a reporting line to the Board of Directors. This special committee includes two independent and recognized experts, namely, Ellen Gracie Northfleet, former Chief Justice of the Brazilian Supreme Court, and Andreas Pohlmann, former Chief Compliance Officer of Siemens in Germany (Petrobras, Report of the Administration, 2016a, p. 11).

In 2016 the Board of Directors approved a new organizational restructuring, and among the changes that took place were the merging of the downstream area with gas and energy and the centralization of corporate activities. Another highlight of the restructuring was the creation of the strategy, organization, and management system to strengthen Petrobras related to strategic matters. The new organizational structure is illustrated below (Fig. 4.21).

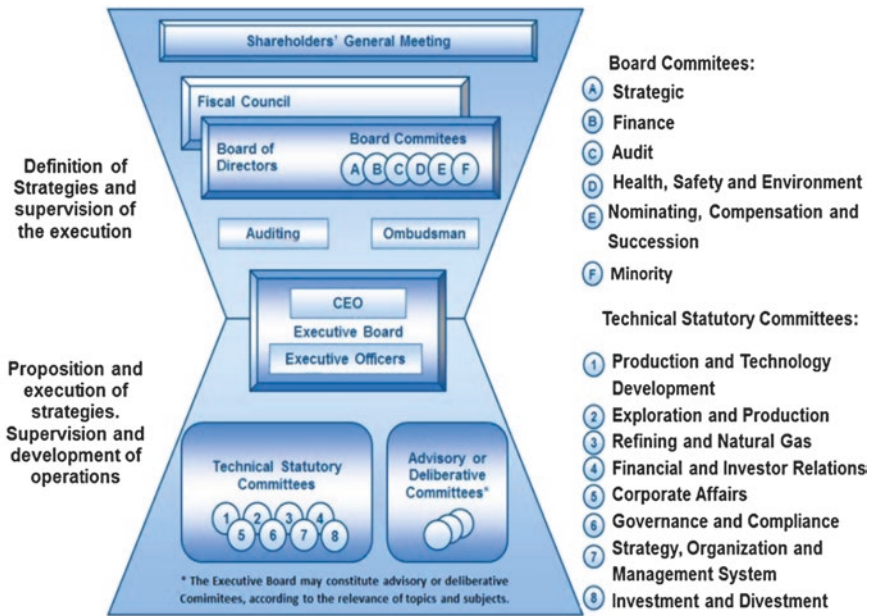
Fig. 4.21 Petrobras organizational structure



Source: Petrobras Report of the Administration, p. 57

The Petrobras corporate governance model has been formalized around the creation of five Statutory Committees subordinate to the Board of Directors, and in 2016 there was further corporate governance improvements illustrated in Fig. 4.22.

Fig. 4.22 Petrobras corporate governance model (2016)



Source: Petrobras Report of the Administration, p. 58

The Petrobras Board of Directors is composed of a minimum of seven and maximum of ten members, and the members are elected at the annual general meeting of voting shareholders, including employee representatives by means of a separate voting procedure, somewhat similar to Statoil's employee-nominated Board Members, except that Petrobras employees can only nominate one Board Member. The term of office may not exceed 2 years and members may be reelected at most three consecutive times. The federal government always has the right to elect the majority of directors, independently of their number, and in addition, the Ministry of Planning, Budget, and Management must indicate one of the Board Members elected by the Brazilian government. As of 2017, the Petrobras Board of Directors totaled nine members, of whom six members were appointed, two appointed by minority-preferred shareholders, and one member appointed by Petrobras employees. Their profiles are noted in Table 4.15. There is only one female member.

Table 4.15 Petrobras Board of Directors, 2016

Name	Affiliation	Background
Luis Nelson de Carvvalho	<ul style="list-style-type: none"> • Chairman • Chair of Audit Committee • Govt. appointed 	<ul style="list-style-type: none"> • Professor at the University of Sao Paulo • Former BOD member of XBRL International, Consultant at the World Bank and Banco Fibra, and Deputy Governor of the Central Bank of Brazil
Jeronimo Antunes	<ul style="list-style-type: none"> • Member • Govt. appointed 	<ul style="list-style-type: none"> • Accounting Professor in FEA/USP • Independent Auditor
Segen Estefen	<ul style="list-style-type: none"> • Member • Govt. appointed 	<ul style="list-style-type: none"> • Professor of Ocean Structures and Subsea Engineering
Francisco Petros Papanthasiadis	<ul style="list-style-type: none"> • Member • Govt. appointed 	<ul style="list-style-type: none"> • Managing partner at Fernandes and Petros Law Firm • Former Executive in financial sector and Chairman of the Brazilian Association of Capital Markets
Dural Santos	<ul style="list-style-type: none"> • Member • Govt. appointed 	<ul style="list-style-type: none"> • Serves in the lawyers council of the Bar Association of Brazil • Guest Professor at LLMDS • Vice Chair of Independent Investigation Committee at Electrobras
Pedro Parente	<ul style="list-style-type: none"> • Member • Govt. appointed 	<ul style="list-style-type: none"> • Former Banco de Brasil Executive and Central Bank • Former Consultant with IMF and former Minister of state • Former Chair of BOD Petrobras
Guilherme Ferreira	<ul style="list-style-type: none"> • Member • Independent shareholders appointed 	<ul style="list-style-type: none"> • Board Member of Sul America, Gafisa, Valid, Arezzo, and T4F Companies

(continued)

Table 4.15 (continued)

Name	Affiliation	Background
Marcelo Filho	<ul style="list-style-type: none"> • Member • Independent shareholders appointed 	<ul style="list-style-type: none"> • Co-founding partner of Leblon Equities and former UBS, Banco Garantia Executive
Ms. Betania Coutinho	<ul style="list-style-type: none"> • Member • Employee appointed member 	<ul style="list-style-type: none"> • Petroleum engineer at Petrobras since 2004 • Representative of employees since April 2016 • Former Deputy Professor at the Federal University of Espirito Santo (UFES)

Source: Petrobras (2017), Form 20-F, April 26, 2017, pp. 123–125

Petrobras' Executive Officers, or the “*directoria*,” are composed of the Chief Executive Officer and seven Executive Officers that are responsible for the day-to-day management of the company, and all the Executives are Brazilian citizens and the Board of Directors elect all. The maximum term for the Petrobras Executive Officers is 2 years, with no more than 3 consecutive reelections allowed, i.e., 6 years. This is a rather short tenure, and while it seems to be in response to the recent Petrobras scandals noted earlier to avoid executive power and patronage developing, yet in comparison with the other NOCs we assessed, there may also be not enough time to allow some measure of stability and leadership continuity to develop. For 2016, the aggregate amount of compensation paid to all Members of the Board and Executive Officers was \$5.5 million (Petrobras, Form 20-F, p. 127), but, unlike Statoil, there was no detailed breakdown provided of compensation paid to individual Board Members or Senior Executives.

According to Petrobras, the company executives have adopted a *Strategic Plan and the 2017–2021 Business and Management Plan* which set out their vision as follows: to become “an integrated energy company with a focus on oil and gas that evolves along with society, generates high value and has unique technical capability.” This vision has led to the formulation of 5 key elements and 21 strategies as follows (Table 4.16).

Table 4.16 Petrobras 5 key elements and 21 strategies

5 Elements of the vision	21 Strategies
(1) Integrated energy company	<ul style="list-style-type: none"> • Reduce Petrobras' risk in exploration and production, refining, transportation, logistics, distribution, and marketing operations through partnerships and divestments • Restructure the energy business by consolidating thermal power assets and other businesses in this segment, seeking an alternative that maximizes our value • Review lubricant business positioning, aiming to maximize our value generation
(2) Focus on oil and gas	<ul style="list-style-type: none"> • Managing the exploration portfolio, in order to maximize economy and ensure sustainability in oil and gas production • Optimize business portfolio, by fully abandoning biofuel production activities, liquefied petroleum gas ("LPG") distribution, fertilizer production, and petrochemical interests, preserving technological skills in areas with development potential • Maximize value generation in the gas supply chain, in line with regulatory developments, ensuring monetization of own production and adapting the participation in the natural gas supply chain as a long-term transition fuel
(3) Evolution with society	<ul style="list-style-type: none"> • Strengthen internal controls and governance, ensuring transparency and effectiveness of the prevention and combat system against misappropriation, without negatively affecting the swift decision-making process • Recover credibility and strengthen our relationship and reputation with all stakeholders, including our control and oversight bodies • Maintain transparent, respectful, proactive dialogue with all stakeholders, by using the best, most modern internal and external communication practices • Align social responsibility actions with our projects
(4) Value generation	<ul style="list-style-type: none"> • Strengthen the management of reservoirs to maximize the value of E&P contracts in all regulatory regimes, seeking opportunities for continuous incorporation of reserves • Ensure discipline in the use of capital and return to shareholders in all of our projects, with high reliability and predictability in delivery • Continuously maximize productivity and cost reduction, in accordance with the best international practices • Promote market pricing and margin maximization policy in the supply value chain • Act with an emphasis on partnerships and divestments as key elements for generating value
(5) Technical capability	<ul style="list-style-type: none"> • Ensure constant development of technological capabilities in areas with development potential, strengthening current business performance and opening options for competitive performance in low carbon, renewable energies, and refining petrochemical integration technologies • Prioritize the development of deepwater production, working primarily in strategic partnerships, bringing together technical and technological skills

Source: Petrobras, Strategic Plan 2017–2021 Business Management Plan; Report of the Administration, 2016, pp. 17–19

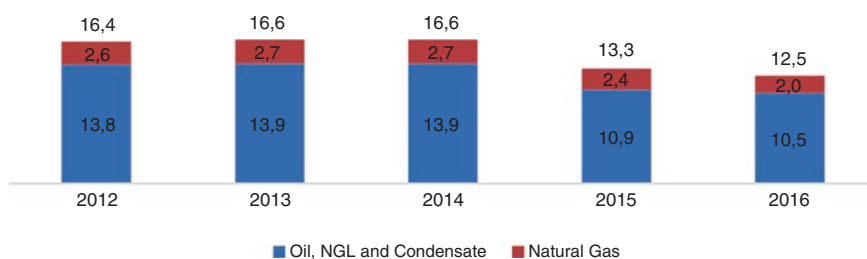
The company has, like Statoil and the other NOCs analyzed, tried to increase the recovery production factor at the *Carmopolis* oil field to 32% levels from current 22% for Brazil's oldest field (Braga 2017). This is far short of Statoil's current level of around 70%, but it also confirms the drive from private shareholders to maximize revenues and add value post privatization. Petrobras has further subdivided its 21 strategies into 72 initiatives, including a strong emphasis on aligning the company's projects with social responsibility actions, and in the areas of social risk management, environmental investments, and community outreach. In 2016, Petrobras approved standards on social risk to meet the Securities and Exchange Commission of Brazil, which considers the impact of the likelihood of risk occurrence in matters of human rights in supply chain and dynamic integration with local communities. Petrobras has invested Brazilian real 120 million (\$37.6 million) in 470 initiatives and partnered with more than 700 entities such as the United Nations Children Fund (UNICEF) and initiatives for marine biodiversity conservation.

As will be discussed in the next chapter, the issue of estimating hydrocarbon reserves is an important element for any potential privatization, including that of Aramco, which has the world's largest onshore reserves. The situation is the same for Petrobras, with some of the world's largest offshore deepwater reserves. How they are estimated and accounted for plays an important element in a company's current and future valuation.

Petrobras determines its oil and gas reserves in line with US Securities and Exchange Commission and the ANP/SPE Brazilian Agency of Petroleum (ANP) and Society of Petroleum Engineers (SPE) criteria. The main differences between the two criteria are:

SEC	ANP/SPE
<ul style="list-style-type: none"> • Only proved reserves are determined • The use of an average price considering each first day of the last 12 months • Concession period 	<ul style="list-style-type: none"> • Proved and unproved reserves are determined • The use of reserve quantities after the concession period

Petrobras uses DeGolyer and MacNaughton like the other NOCs discussed earlier, and the audit company used Petrobras reserve estimates to conduct a reserve audit of 97% of the net proved crude oil, condensate, and natural gas reserves as of 31 December 2016 in Brazil and in the USA in accordance with SEC regulations. However, the SEC reserve estimates and those under ANP/SPE criteria can differ as illustrated in the figures that follow (Fig. 4.23).

Fig. 4.23 Proven reserves of oil, NGL, condensate, and natural gas – ANP/SPE criteria (billion boe)

Source: Petrobras, Report of the Administration, 2016a, p. 14

Figure 4.23 indicates a declining proven reserve reaching 12.5 billion barrels by year-end 2016 with Table 4.17a illustrating how this figure was arrived at for 2016 using ANP/SPE methodology, while Table 4.17b examines Petrobras proved reserves for the period 2014–2016 using SEC methodology.

Table 4.17a Evolution of proven reserves in 2016 (ANP/SPE criteria)

Composition of proven reserves	Petrobras (billion boe)
(a) Proven reserves December 2015	13.279
(b) New discoveries and new accruals in 2016 ¹⁰	0.110
(c) Monetization of reserves in 2016 ¹¹	-0.153
(d) Revisions in 2016 ¹²	0.203
(e) 2016 balance (b + c + d)	0.160
(f) 2016 production in the year	-0.925
(g) Annual variation (e + f)	-0.765
(h) Proven reserves December 2016 (a + g)	12.514

Source: Petrobras, Report of the Administration, 2016a, p. 38, Petrobras Form 20-F Annual Report 2016, p. 55

Table 4.17b Petrobras: proved reserve, (million barrels of oil equivalent) (SEC Criteria)

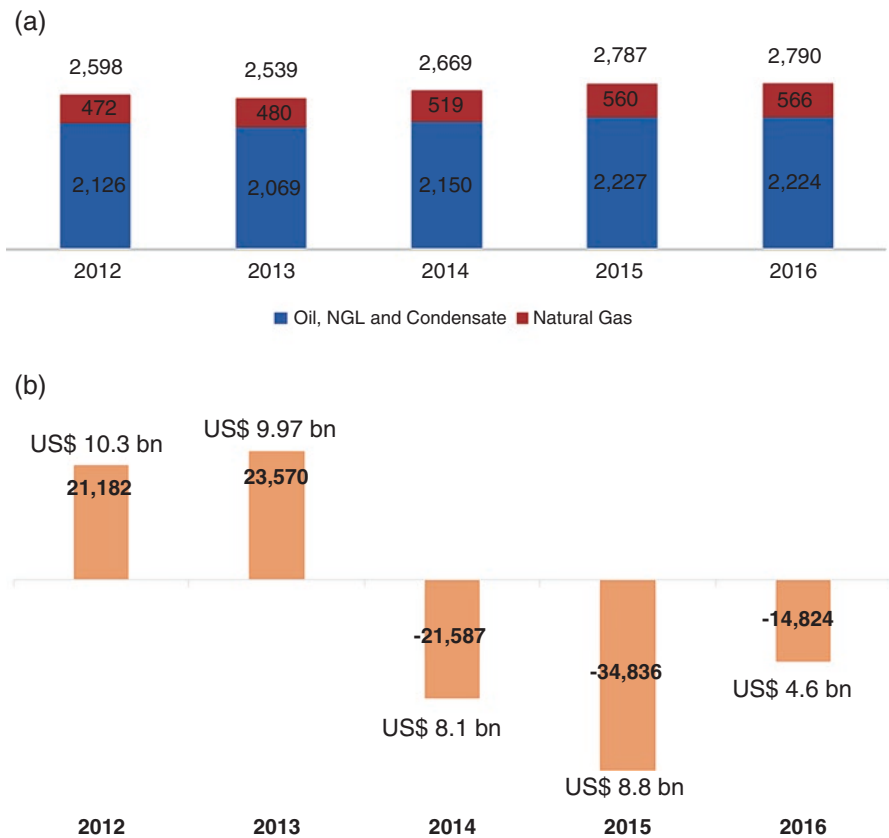
	2016	2015	2014
Proved reserves, beginning of year	10,516	13,141	13,134
Discoveries and extensions	103	494	316
Improved recovery	0	22	2
Revisions of previous estimates	131	(2186)	718
Sales of minerals in situ	(169)	(22)	(163)
Purchase of minerals in situ	16	0	31
Production	(925)	(932)	(898)
Proved reserves, end of year	9672	10,516	13,141

Source: Petrobras, Report of the Administration, 2016a, p. 38, Petrobras Form 20-F Annual Report 2016, p. 55

The difference in proved reserves using SEC and ANP/SPE criteria is quite significant, amounting to 2.842 billion barrels of oil equivalent for year-end 2016 or 22% lower using SEC criteria compared to the higher ANP/SPE criteria. According to Petrobras Form 20-F SEC filing, around 97% of proved reserves are in Brazil, roughly split between the *Campos Basin* and the *Santos Basin*, with North American reserves accounting for around 1.2% (Petrobras, Form 20-F, p. 54).

Despite a rising production trend in both oil and natural gas production, Petrobras has registered net income losses during the period 2014–2016 as illustrated in Fig. 4.24.

Fig. 4.24 Petrobras. (a) Production of oil, NGL, condensate, and natural gas (thousand boed) 2012–2016. (b) Consolidated net income (Loss) (Brazilian real \$ million)

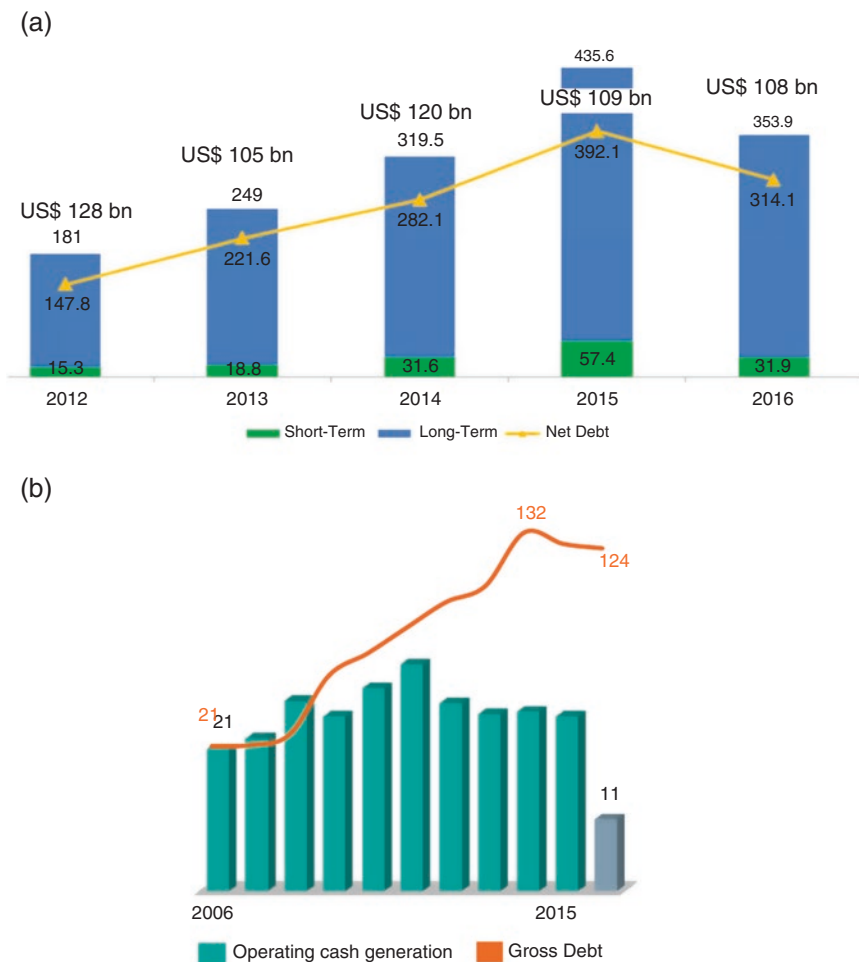


Source: Petrobras, Report of the Administration, 2016a, pp. 14, 85)

Note: Brazilian real to 1 US \$: 2016, 3.255; 2015, 3.960; 2014, 2.657; 2013, 2.362; 2012, 2.048

The fall in both gross and net income for Petrobras has been attributed to a combination of a drop in sales of derivatives in the domestic market, a drop in oil and derivative export prices, and a continuing devaluation of the Brazilian real against the dollar which has also added pressure. Given the above results, Petrobras did not distribute dividends for the years 2015 and 2016 compared with a US \$3.9 billion payment in 2014. Concerning Petrobras’ outstanding debt, this decline to US \$118 bn in 2016 from US \$126 bn in 2015 was mainly due to the appreciation of the Brazilian real and the amortization of debt using proceeds from divestments. This is illustrated in the next set of figures (Fig. 4.25).

Fig. 4.25 (a) Consolidated debt (R\$ billion). (b) Growing debt relative to cash generation (US\$ billion)



Source: Petrobras, Report of the Administration, 2016a, pp. 11, 16

As of 31 December 2016, the average maturity debt stood at 7.46 years, up over 7.14 years as of 2015. Petrobras used traditional funding sources in the domestic and international capital markets to obtain the necessary funding to repay debt and fund its capital expenditure, raising approximately US \$19 bn through proceeds from long-term financing and US \$5 bn from the China Development Bank maturing in 10 years. This accumulation of debt and repayment burden has affected the company's credit rating, which has also been affected by Brazil's sovereign risk. Compared with the investment grade ratings for Rosneft and Statoil, all the three credit rating agencies have assigned non-investment speculative ratings for Petrobras as of 2017 (Moody's B2; Standard & Poor's BB; and Fitch BB).

As discussed, Petrobras is a key pillar of Brazil's energy industry and a mainstay of its economy. Transforming it into a modern, multinational oil and gas company that can compete both domestically and internationally can assist in transforming the structure of the Brazilian economy, decreasing any oil import dependency problem, and improving national security. Despite some of the issues facing it in terms of profitability, Petrobras has, by changing its ownership structure and opening up to international investors, enabled the company to potentially change the value of not only a publicly held company but also general corporate governance and social reforms.

China's Sinopec

There is a strong body of thought that asserts that despite claims that Chinese NOCs are autonomous in their strategies and policies, a large degree of state control still exists in these Chinese NOCs through deeply entrenched mechanism that directs energy policy and pursues the state's strategic interests through the NOCs (Francisko 2013; Bian 2005; Hassard et al. 2007; Wang 2006).

Although reforms, corporatization, and internationalization of Chinese state-owned enterprises have given the NOC's operational autonomy, the underlying policy-making direction is still subject to central government authority, as with funding and investments (Francisko 2013, p. 2; Baster et al. 2015; Lewis 2004b). Some argue, however, that the growing commercialization success of Chinese NOCs increases their political power, financial clout, and technical expertise and provides them with considerable influence over energy projects and policies in China (Downs and Meidan 2011). In contrast, Taylor (2012) characterizes the Chinese government and NOC relationships as a "collaboration governed by hierarchy" and that although the different NOCs within the Chinese political system might have varied interests, the ability of the Chinese Communist Party (CCP) as a political institution to establish top-down control should not be underestimated (Lester et al. 2015).

The China National Offshore Oil Corporation (CNOOC) was established in 1982 to handle offshore explorations and joint contracts with foreign oil companies, and in 1983, the state-controlled ministries of petroleum, chemical, and textile were incorporated to form the China National Petrochemical Corporation (Sinopec).

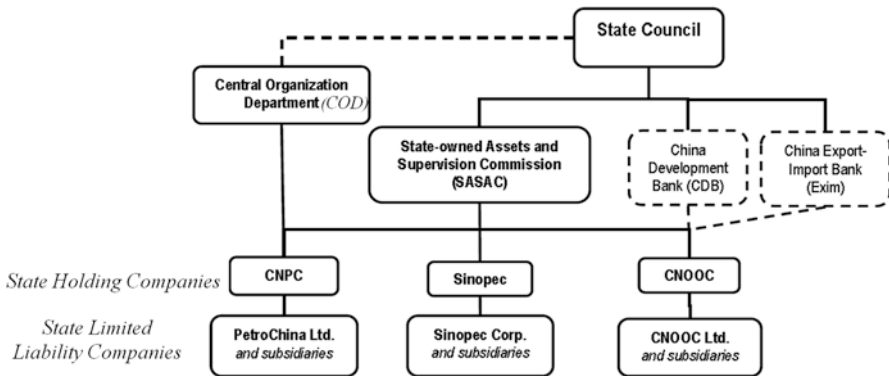
While CNOOC functioned under the Ministry of Petroleum and Industry, Sinopec was under the direct supervision of the State Council and was tasked to operate downstream, including the formulation of policies for producing refined oil products and petrochemicals, supervision of the construction and operation of refining and petrochemical plants, and the marketing of refined oil products and petrochemicals in China (Zhang 2008). In its early days, though centrally planned, both CNOOC and Sinopec followed the profit retention trend of the Chinese state-owned enterprises that made the first wave of the so-called corporatization.

Further reforms followed in China, whereby the Ministry of Petroleum and Industry (MPI) was restructured in 1988 to form the China National Petroleum Industry (CNPC), and charged to manage all the assets of the MPI. CNPC was given full administrative functions and permitted to engage in onshore oil and gas development. The State Council also granted CNPC the right to oversee international cooperation in the planning, exploration, development, and production of offshore shallow areas. In essence, with the establishment of CNPC, there were now three NOCs operating in China – CNPC, CNOOC, and Sinopec – to form the country's petroleum industry. This institutional transformation paved the way for the central government to give up control over the entire management of the petroleum production chain and shifted the responsibility of profits and losses to the NOCs (Kong 2010). The NOCs played a dualistic role in the petroleum market, as they were both market participants and market regulators.

November 1993 was an important date for the Chinese NOCs as in that year the Third Plenary Session of the 14th Chinese Communist Party (CCP) Central Committee adopted the document on the “Decision concerning the establishment of a Socialist Market Economic Structure,” marking the central government's move in transitioning the Chinese economy from traditional planning to a “socialist market economy” (Wang 2006). The impetus for reforms came when the need to prepare the NOCs for global competition in preparation for China's World Trade Organization (WTO) membership. Until then, the NOCs were operating within their allocated areas of specialization and segmented and curtailed in a single area of operation. CNPC was focused on onshore engineering and procurement, Sinopec on downstream refining and petrochemical operations, while CNOOC was responsible for offshore engineering and procurement and cooperation with foreign companies (Zhang 2008). The restructuring of the oil sector began in 1998 with the vertical integration of CNPC and Sinopec, and as a fully integrated oil and petrochemical group, the new CNPC and Sinopec group gained upstream and downstream portfolios. However, despite these changes, the Chinese NOCs still remain under the authority of the Chinese Communist Party through a variety of ways, namely, institutional mechanisms through the Central Organization Department (COD) and the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), as well as the political and administrative mobility of Senior Executive between the corporate and government bodies and the system of personal connections or “*guanxi*” that binds cliques and political networking (Francisko 2013; Alon and McIntyre 2008; Downs and Meidan 2011).

The ownership and control of shares and assets of the Chinese-owned enterprises (SOEs) falls on the SASAC, which was created in 2003 and illustrated in Fig. 4.26.

Fig. 4.26 Administrative Control of Chinese NOCs



Source: Francisko (2013, p. 21)

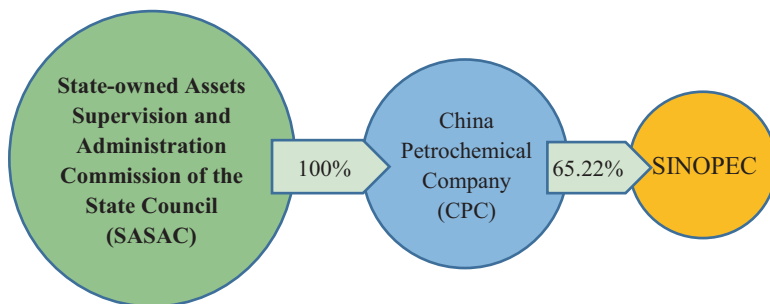
As noted in Fig. 4.26, the central government's executive organ, the State Council, receives the government's ownership authority, and the SASAC created directly under its control was to take the investor and administrative responsibilities of the NOCs. Although the SASAC's responsibilities do not extend to the company's operations, production, and development, it holds the majority of shares in these NOCs and has executive control over corporate policy and executive appointment, a far cry from what was noted for Statoil. Its main priority is to ensure efficient company performance through the control of its board of directors and setting of the company's main strategy agenda. As an investor, the SASAC exercises strategic ownership rights over the NOC's assets and investment strategies, financial planning, corporate development, and asset and equity management, again a far cry from all the three other NOCs analyzed in this chapter. Further, the SASAC also exercises regulatory powers over the remuneration allocation, disposal of substantial assets, and restructuring plans, including all mergers and acquisitions. The Chinese NOCs could not mobilize capital and issue bonds without SASAC's approval (Naughton 2006). The seeming total control by the SASAC over Chinese NOCs may limit their capacity to pursue their own and shareholders' interests that may be divergent from the state's interest as highlighted earlier in the chapter. However, as illustrated in Fig. 4.26, while the SASAC owns and regulates the NOCs, one of the most important institutional mechanisms of political and administrative control of the Chinese Communist Party (CCP) is the Central Organization Development (COD) which has power over the executive appointment within the CCP, including ministerial and vice-ministerial positions, and there seems to be a "revolving door" between CCP and NOC officials, which is an indication that the government recognizes that the technical and administrative capacities these NOC

executives have developed in businesses are transferable to the government. This is somewhat reminiscent of Saudi Aramco's perceived success in managing its operations, with key Aramco Executives either seconded or transferred to run other government departments or projects as noted in the previous chapter.

Sinopec Corporation was formed in 2000 as a joint stock entity under the China Petrochemical Corporation Group or Sinopec Group. By October 2000, it entered the Hong Kong, New York, and London markets gathering \$3.7 bn of funds for its IPO and issued 1.8 million shares, representing 20% of its total shares and costing around \$20.6 per share. Eighty percent of the issued shares were state owned, distributed between Sinopec Group and Bank of China. A Shanghai listing was completed in June 2001 (Yusuf et al. 2006). Through the enlistment of Sinopec in major international exchanges, the company was able to raise funds and expand its investment mechanism globally (Miao 2012).

However, it was not until 2005 that the Chinese government eliminated the various share ownership types and made all shares legally tradable, but this had no impact on the ownership structure of the NOCs for fundamentally they still belonged to the government through the SASAC. This is illustrated in Fig. 4.27.

Fig. 4.27 Sinopec: the controlling relationship between the company and de facto controller



Source: Sinopec Annual Report, 2015a, p. 44

By 31 December 2016, the CPC share had increased to 71.32%. Other shareholders are listed in Table 4.18, with a further state ownership of 7.32% through CITIC Ltd. and 20.16% held by foreigners through Hong Kong Securities Clearing Company (HKSCC). Table 4.19 sets out the disclosed owners of the HKSCC "H" shares.

Table 4.18 SINOPEC: shareholding of the top shareholders as of 31 December 2016

Names of shareholders	Nature of shareholders	Percentage to total share capital (%)
CPC	State-owned legal person	71.32
Hong Kong Securities Clearing Company (Nominees) Limited (“HKSCC (Nominees) Limited”) ^a	Overseas legal person	20.16
CITIC Limited	State-owned legal person	7.32
Beijing Harvest Yuanhe Investment Center (Limited Partnership)	Others	1.07
Nanjing Ruisen Investment Management Partnership Enterprise (Limited Partnership)	Others	0.13

Source: Sinopec Annual Report, 2017, p. 7

^aNote: HKSCC agent for different clients

Table 4.19 Disclosed foreign shareholders through the HKSCC (H) shares. 31 December 2016

Shareholders	Status of shareholders	Approx percentage of Sinopec's Corp. issued shares capital (%)
• JPMorgan Chase	– Beneficial owner	1.93
	– Investment Manager	0.74
	– Custodian	3.56
• BlackRock Inc.	– Interest of corporation controlled by the substantial shareholder	8.93
• Schroders PLC	– Investment Manager	5.00

Source: China Petroleum & Chemical Corporation, Annual Results for the year ended 31 Dec. 2016. p. 7

The Sinopec Annual Reports, unlike the other NOCs assessed in this chapter, are somewhat sparse in detailing corporate governance policies and strategies, except in advising that during 2015 the company revised 16 corporate governance documents including its articles of association, rules and procedures of the general meeting of shareholders, rules of procedures of the Board of Directors, working system of investor relations, etc. without detailing them (Sinopec Annual Report, 2016, 54). The lack of more detailed information is that, along with other state-owned enterprises in China, the overall control and nominations of the three most senior positions – the General Manager, the Party Secretary, and Chairman of NOCs – are also under the Central Organization Department or COD. All Executives chosen to hold these positions are consequently members of the CCP, and the Chairman of the company is also a Party Secretary. This duality of rank characterizes the Chinese administrative model, whereby the Board Chairman of a company is viewed as the effective leader whose authority supersedes that of the Chief Executive Officer as noted from the other NOCs analyzed earlier. However by 2016, and as a sign that it

intends to operate along more acceptable international listed company governance methods, the Sinopec Board's Audit Committee was both chaired by an independent Board Member and composed entirely of independent Board Members, and the Committee may engage independent professionals when performing its duties (Sinopec Annual Report, 2016, p. 47).

Energy security is considered as one of the CCP's key strategic priorities (Lee 2012). As such, tight control over Executives in the energy sector is instituted, and guidelines for nominations for key positions include political reliability through CCP membership, strong administrative qualities, and practical work experience. Their technical knowledge of the domestic and global energy industries makes Chinese NOC Executives indispensable to the CCP's concerns on energy security and stable economic growth and development (Francisko 2013). This relationship ensures that Chinese NOC's Executives like Sinopec's fully understand that alongside stable corporate results and shareholder profitability, they also need to ensure that their firms advance the Communist Party's interests (Downs and Meidan 2011), resulting in transference between government and corporate positions as illustrated for some Senior Sinopec Executives below (Table 4.20).

Table 4.20 Sinopec group Executives and government position rotations

Zhang Gaoli	Member of the Standing Committee of the Politburo of the 18th CPC Central Committee
1970–1985	Years worked in Sinopec
1984–1985	Manager, Sinopec Corp., Maoming Petrochemical Company
Li Yizhong	Member of the 17th CPC Central Committee
1980–2000	Years worked in Sinopec
2000–2003	Chairman, Sinopec Corp., Board of Directors
Zhang Youcai	Vice-Chairman of the Financial and Economic Committee of the NPC
2003–present	Years worked in Sinopec
2006–	Vice-Chairman, Sinopec Corp., Supervisory Committee
Chen Jinhua	Vice-Chairman of the 9th CPPCC National Committee, Chairman of the Chinese Federation of Enterprises
1983–?	General Manager, Sinopec Corp.

Source: Sinopec 2015a, Annual Results for the year ended 31 December 2015, Hong Kong Exchanges, p. 24

The nearest other NOC that has some of the above Chinese government/NGO “revolving door” rotation is that of Rosneft, but it is not as deep rooted in Rosneft, as there are board governance checks and balances in place through independent board membership. The fact that Aramco's current Chairman Mr. Khalid Al Falih is also a government Minister of Energy and a former Aramco CEO ensures that the company's interest and those of the state are aligned. How much this might change, post an Aramco partial privatization will be discussed in the next chapter. However, there could be some unintended beneficial consequences for the NOCs arising from a close “revolving door” appointment policy, whereby the existence of a new “petroleum faction” within the Chinese Communist Party could gradually further enhance the politi-

cal economy of the Chinese NOCs and increase their political leverage within the CCP itself, as this new faction is composed of Oil Executives who are mostly Western educated and have gained some extensive international working experience.

Table 4.21 sets out Sinopec's Board Members, composed of ten members and with no female members.

Table 4.21 Sinopec Board of Directors 31 December 2016

Name	Function/role	Experience and background
WANG Yupu	<ul style="list-style-type: none"> Chairman Non-Executive Director 	<ul style="list-style-type: none"> Chairman and Secretary of the leading Party Member Group of China Petrochemical Corp., Alternate Member of the 17th COC Central Committee, and Member of the 18th CPC Central Committee Vice President (Minister Level) of the Chinese Academy of Engineering
DAI Houliang	<ul style="list-style-type: none"> Vice-Chairman President of Sinopec, Executive Director 	<ul style="list-style-type: none"> Former Vice President of Yangzi Petrochemical Co, Chairman of Board of Directors of BASF-YPC Company Ltd.
WANG Zhigang	<ul style="list-style-type: none"> Director Executive SVP Sinopec 	<ul style="list-style-type: none"> Former Board Member and President of Shengli Oilfield Co, Deputy Director General and Deputy Secretary of Leading Party Member Group of Economic and Trade Commission
ZHANG Haichao	<ul style="list-style-type: none"> Director, Executive SVP Sinopec 	<ul style="list-style-type: none"> Former VP of Zhejiang Petroleum Corp., Secretary of CPC Committee, VP of China Petrochemical Corporation
JIAO Fangzheng	<ul style="list-style-type: none"> Director, Executive SVP Sinopec 	<ul style="list-style-type: none"> Former VP of China Petrochemical Corporation, President of Sinopec Northwest Oil Field Company
MA Yongsheng	<ul style="list-style-type: none"> Executive Director SVP Sinopec 	<ul style="list-style-type: none"> Former Manager and Party Secretary of Sinopec Southern Exploration and Production Company; Vice President of China Petrochemical Corporation; General Manager and Deputy Secretary of the CPC Committee of Sinopec Exploration Company
JIANG Xiaoming	<ul style="list-style-type: none"> Independent non-Executive Director 	<ul style="list-style-type: none"> Acts as member of the national committee of the CPPCC, Director of China Foundation of UN Board of Investment ; Chairman of the Board of Directors of Hong Kong Saibo International Co. Ltd; Senior Fellow of the University of Cambridge Business School; Chairman of Frasers Property China Co. Ltd; Advisory Committee of American Capital Group, Rothschild, and the British Investment Bank
ANDREW YAN	<ul style="list-style-type: none"> Independent non-Executive Director 	<ul style="list-style-type: none"> Founding MD of SAIF Partners; independent non-Exec Director of China Resources Land Ltd, the Cogobuy Group, Feng Deli Holdings Ltd, Sky Solar Holdings Ltd Former Economist with the World Bank , Fellow of Hudson Institute USA, MD of Emerging Markets Partnership and Director of Hong Kong Office of AIG Asia Infrastructure Investment Fund

(continued)

Table 4.21 (continued)

Name	Function/role	Experience and background
TANG Min	<ul style="list-style-type: none"> Independent non-Executive Director 	<ul style="list-style-type: none"> Counselor of the State Council of the PRC and Exec Vice Chair of YouChange China Social Entrepreneurship Foundation; independent Director of Origin Agritech Ltd, Baoshang Bank Co., and former Economist with the Asian Development Bank
FAN Gang	<ul style="list-style-type: none"> Independent non-Executive Director 	<ul style="list-style-type: none"> Vice President of China Society of Economic Reform Foundation, Head of the National Economic Research Institution, Deputy Head of the Institute of Economics of Chinese Academy, and served as member of the Monetary Policy Committee of the People's Bank of China

Source: Sinopec Annual Report, 2017, pp. 60–64

The four independent non-Executive Directors bring with them a mixture of international experience with listed companies and will serve until February 2018. Unlike Statoil and Petrobras, there is no employee-nominated Board Member, and the key Board Member with executive power is the Vice-Chairman and President Dai Houliang. The non-Executive Directors did not receive any payments.

Sinopec today has the ability to cover the full industrial chain of oil field services from exploration, development, to production, and the company is the biggest provider of petroleum engineering services and integrated oil field technical services in China. With respect to refining capacity, it ranks first in China and is the largest supplier of refined oil products in the country. In terms of ethylene production capacity, it takes first place in China with a well-established marketing network for chemical products. The table that follows illustrates the company's operations performance over the period 2013–2015 (Table 4.22).

Table 4.22 Sinopec operational growth

	2015	2014	2013
(a) Exploration and production segment			
• Oil production and gas production (mmbœ)	471.9	480.2	442.8
• Crude oil production (mmbbls)	349.4	360.7	332.5
– China	296.3	310.8	310.8
– Overseas	53.1	49.8	21.7
• National gas production (bcf)	734.8	716.4	660.2
(b) Sinopec refining segment (million tonnes)			
• Refining throughput	236.5	235.4	231.9
• Gasoline, diesel, kerosene	148.4	146.2	140.4
– Gasoline	53.9	74.3	45.6
– Diesel	70.0	20.7	77.4
– Kerosene	24.3	39.2	17.4
• Light chemical feedstock	28.8	39.2	37.9

Source: Sinopec 2015b, Annual results for the year ended 31 Dec. 2015, Hong Kong Exchanges and Clearings Ltd., pp. 11, 15

Sinopec takes great pride in its diverse engineering services and has established specialized wholly owned subsidiaries, such as:

- *Sinopec Oilfield Service Corporation* (Petroleum engineering and technical services)
- *Sinopec Oil Engineering Company Ltd.* (Geophysical Prospecting)
- *Sinopec Oil Engineering and Construction Corporation* (Engineering and Construction)
- *Sinopec International Petroleum Service Corporation* (Petroleum Engineering and Technical Services)

In 2015, according to the company's Annual Report (p. 9), the Sinopec Group stepped up efforts in expanding its international market and revenues from international business reached RMB13.8bn (\$2.12bn), with international revenue accounting for 23% of total business revenue. Sinopec has also focused on leveraging its technical and engineering skills in the Middle East and reported that the company completed contracts valuing \$630 million in Saudi Arabia, exceeding \$800 million for a second straight year, and also completed contracts in Kuwait valued at \$310 million, as well as contracts worth \$160 million in Algeria (2015 Annual Report, p. 9).

Sinopec has also sought out partners in both its China operations and through pursuing international joint venture partners. In 2007, Saudi Aramco and ExxonMobil signed a deal with Sinopec to revamp its *Fujian* Oil Refining to triple its capacity to 240,000 bpd. In 2009, Sinopec completed a takeover of Geneva-based Addax Petroleum for \$7.5 bn, making it China's biggest foreign takeover, with Sinopec's acquisition opening up oil production and exploration activities in the Middle East, North Sea, and West Africa. In 2013, the company acquired a 33% stake in Apache Corporation's oil and gas business in Egypt for \$3.1 bn. Sinopec's quest for international diversification mirror's Statoil's expansion in the North American shale sector, but the Chinese government's geostrategic search for oil and increasing its oil reserves is more acute than Norway's (Lee 2012; Houser 2008). Compared with the other NOCs assessed in this chapter, Sinopec's crude oil and gas reserves are quiet modest as illustrated in Table 4.23.

Table 4.23 Sinopec Crude oil and natural gas reserves 2014, 2015

ITEM	31 Dec. 2015	31 Dec. 2014
(A) Crude oil (mmbbls)		
• Proved reserves	2243	3048
• Proved developed reserves	2013	2782
– <i>China</i>	1701	2465
– <i>Overseas</i>	312	317
• Proved underdeveloped reserves		
– <i>China</i>	201	235
– <i>Overseas</i>	29	31

(continued)

Table 4.23 (continued)

ITEM	31 Dec. 2015	31 Dec. 2014
(B) Natural gas (bcf)		
• Proved reserves	7570	6741
• Proved developed reserves	6457	6011
– China	6439	5987
– Overseas	18	24
• Proved underdeveloped reserves	1113	730
– China	1112	728
– Overseas	1	2

Source: Sinopec 2015, Annual Results for the Year Ended 31 Dec. 2015, p. 12

According to the company, it manages its reserves estimation through a two-tier management system. The first is through the Oil and Natural Gas Reserves Management Committee (RMC), which oversees the overall reserves estimation process and reviews the estimations for the whole company. Professional staff with experiences in geology, engineering, and economic staffs the RMC. Sinopec also engages outside Consultants who assist it to be in compliance with the US Securities and Exchange Commission rules and regulations, but Sinopec Annual Report does not highlight the estimated differences between its in-house reserve estimations and those carried out under US SEC regulations as noted for Petrobras's estimations.

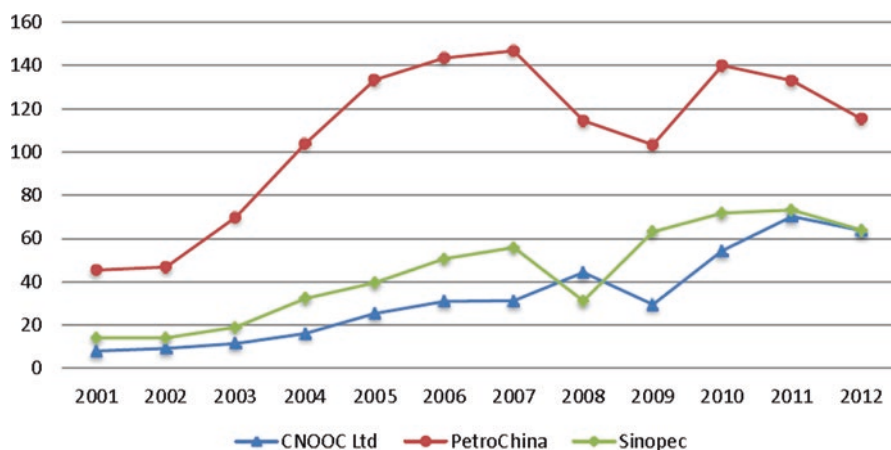
Table 4.24 summarizes Sinopec's key financial highlights prepared in accordance with International Financial Reporting Standards (IFRS), as Sinopec also reports its financials in accordance with China Accounting Standards for Business Enterprises (ASBE), with some significant variances between them.

Table 4.24 Sinopec key financial indicators year-end 2011–2015 (RMB million)

Indicator	2015	2014	2013	2012	2011
• Operating profit	57,028	73,487	96,785	98,662	105,530
• Net profit	32,438	46,666	66,132	63,879	73,225
• Basic earnings per share (RMB)	0.268	0.398	0.570	0.566	0.650
• Return on capital employed (%)	5.24	6.05	8.02	9.09	11.49
• Return on net assets (%)	4.81	7.84	11.63	12.50	15.50
• Total equity	674,029	593,041	568,803	510,914	472,328
• Net assets per share (RMB)	5.567	5.014	4.880	4.527	4.191

Source: Sinopec, Annual Report 2015

Like the other NOCs analyzed in this chapter, the fluctuation in operating profit was mainly due to the sharp drop in crude oil prices from 2014, resulting in the decrease of realized profit of the company's upstream segment. Such profit fluctuations are not peculiar to Sinopec but also to the other major Chinese NOCs as illustrated in Fig. 4.28.

Fig. 4.28 Chinese NOC net profits from 2001 to 2012 (in billions of RMB)

Source: Francisko, 2013, p. 78

According to the company, the rate of corporate tax paid to the government is set at 25%, but the level is reduced to 15% for preferential development projects, while Sinopec is also required to withhold and pay enterprise income tax at the rate of 10% on behalf of nonresident shareholders whose names appear on the register of members for “H” shares of Sinopec, as noted earlier in Table 4.19. Such an enterprise income tax is withheld from dividends payable to these shareholders, but this may be returned under relevant reciprocal tax treaties between China and the holders’ country (Sinopec 2017).

In terms of outstanding debt, Sinopec’s net debt position as of 31 December 2015 amounted to RMB 10.834 bn (\$1.7 bn) compared with RMB 11.381 bn (\$1.75 bn) a year earlier, the majority being short-term debt and representing a debt to equity ratio of 30.52% for the year-ending 2015, compared with 37.84% for 2014 (Annual Report 2015, p. 129).

A key question for the Chinese NOCs is the future direction of energy reform. President *Xi Jinping* launched his own reform agenda at the Third Plenum of the 18th Party Congress, with a document emerging entitled “Decision on Major Issues concerning Comprehensively Deepening Reforms” in November 2013. However, even President *Xi* admitted that it will be a tough and complicated task for the Chinese Communist Party to deepen reform, and some analysts pointed out to potential contradictions that while the document stated “markets will play a decisive role,” an upgrade from their former “basic” role, it was also stressed that the “state sector remains dominant” (Lester et al. 2015). It was not clear from the Third Plenum deliberations if the reformist wing of the CCP had anything in mind to open strategic sectors such as energy to free market competition and passing legislation enabling private enterprise to enter the upstream oil and gas sector, leading to unleashing competitive forces. This was something that automatically did not

happen as noted from Brazil's experience with Petrobras. The push in China for the NOCs like Sinopec is for more efficient management, improved governance, and curtailment of political privileges between CCP membership and NOC Executives as highlighted earlier.

The Partly Privatized NOCs: How Do They Compare?

We selected four NOCs, Statoil, Petrobras, Rosneft, and Sinopec, to assess the history of these companies from fully owned state institutions to part privatized energy companies. All four provided easily accessible, comparable data of varying quality in their annual reports or those mandated by the US Securities and Exchange Commission, especially in filing 20-F Reports. All four companies are integrated firms with significant operations in the midstream, upstream, and downstream sectors of the oil and gas industry. All four NOCs span the spectrum of commercial frameworks but with varying degrees of country economic reliance on the hydrocarbon sector, with China and Brazil being net hydrocarbon importers with large domestic markets for energy.

A key interlinked element of all these four NOCs have been international diversification, a willingness to partner with IOC companies in the home market and overseas, and the development of technological expertise that has enable some, like Petrobras, to become industry leaders in specific areas of oil and gas in deep water drilling technology. Statoil's motivation for international expansion was a perception that the Norwegian continental shelf had become a mature area and that corporate growth could only be sustained by overseas diversification and the company's move into US shale production. Sinopec and Rosneft were both faced with little or no reserves or production outside their home countries, and they decided to approach this by entering into technical production alliances in difficult geological regions, such as Rosneft in Siberia with foreign IOCs, while Sinopec moved into oil-producing countries in Africa to acquire oil reserves. NOC diversification involves not only geographical spread but also variety in hydrocarbon output. Gas production has also become an important element for the four NOCs we analyzed. At the same time, all four NOCs were faced by corporate social responsibilities to society at large but approached this in different ways. The key socioeconomic policy objectives faced by the four NOCs are illustrated in Fig. 4.29.

Fig. 4.29 Statoil Rosneft, Petrobras, and Sinopec socioeconomic policy objectives

Objective	Sinopec	Petrobras	Statoil	Rosneft
Wealth Redistribution				
Fuel subsidies	Politically driven			Economically driven
Employment	Politically driven			Economically driven
Social welfare programs	Politically driven	Economically driven		Economically driven
Economic development				
Technology transfer	Economically driven		Economically driven	
Local content		Economically driven	Economically driven	Economically driven
Subsidized feedstock	Economically driven	Economically driven		Economically driven
Wealth Creation				
Rising per capita income	Politically driven	Economically driven	Economically driven	
Fund for future generations			Economically driven	
Energy securities				
Security of demand	Economically driven			
Vertical integration	Economically driven			
Security of supply	Economically driven			
Prevent energy shortages	Economically driven			
Foreign Policy				
Build alliance	Politically driven	Politically driven		Politically driven
Export/ production	Politically driven			Politically driven
Domestic Politics				
Involvement in domestic politics	Politically driven		Politically driven	Politically driven

Legend: Politically driven Economically driven Not a priority

From the above figure, Statoil stands out as the least politically driven NOC, compared with Sinopec and Rosneft, but with Statoil’s involvement in domestic Norwegian energy politics remaining high. Local content was important for all the NOCs, with the exception of Sinopec, which placed this at a lower priority, compared to a strong emphasis on energy security as noted for China’s energy security policy agenda.

The issue of NOC governance and Board of Directors’ composition and independence has been highlighted for all the four NOCs, as corporate governance plays a significant role in protecting the interests of shareholders, as well as improving firms’ profitability and overall competitiveness. It becomes important to assess the governance structure of the four NOCs to understand whether this has had a significant bearing on the financial performance of the NOCs, addressed later in this chapter. In the section that follows, we examine and rank the four NOCs by assessing both corporate and public sector governance, which are defined as follows:

- *Corporate governance* – this captures the structure and organization of an NOC, its decision making, budgetary autonomy, authority, sources of capital, disclosure level and transparency, the skilled capacity of its workforce, and the breadth and skills of its Board of Directors.

- *Public sector governance* – this refers to a country’s institutional and legal framework that governs the NOC/energy sector in terms of specific sector policies, legal and regulatory framework, and the presence of a culture of accountability.

Issues of corporate governance and state influence are often difficult to identify in very concrete terms, and using a proxy for government shareholdings in each of the four NOCs does not provide a definitive picture, as these stood at the following percentages as of 2016:

• <i>Rosneft</i>	69.5%
• <i>Statoil</i>	67%
• <i>Petrobras</i>	50.2%
• <i>Sinopec</i>	72.5%

Petrobras has the lowest level of state ownership at 50%, the Norwegian government owns 67%, the Russian government holds around 70%, and Sinopec’s government owns at 72.5% giving these two governments a super majority that, in theory, enables them to decide on all strategic decisions of their NOCs. However, as noted earlier in the chapter, the Norwegian government and Statoil have adopted a fundamental principle of zero state interference in the operational and strategic management of the company, but this does not mean that Statoil’s management cannot be influenced by the largest shareholder and does not take the country’s geopolitical interest into account when making strategic international decisions. This is something that will be analyzed for Saudi Aramco given the planned level of government ownership of around 95%. In the case of Sinopec, personal influence and ruling party connections continue to play a role, and despite some reforms, there is still a strong connection between politicians and Senior Executives in the direct running of this NOC. The history of Board representations at Rosneft indicates that the Russian state’s influence over the company remains strong. As noted from the composition of Rosneft’s Board of Directors, the company appears to emulate the “partial NOC” model by increasing the role and number of independent Directors, and the level of direct government influence has decreased, but again one must stress that the concept of “board independence” is a subjective one, as although many of the board appointees are “independent” of Rosneft, some continue to have close ties to the state as noted from several of the other NOCs, with the result that “independent” Board Members might not be truly independent.

Table 4.25 Corporate and public sector governance indicators – Statoil, Petrobras, Rosneft, and Sinopec

Indicator	Statoil	Petrobras	Rosneft	Sinopec
(A) Corporate governance				
1. Ownership structure and govt. ownership	Yes. High	Yes, Low	Yes. High	Yes. High
2. Domestic/international listing	Yes. Oslo, NYSE	Yes, Brazil, NYSE	Yes, Moscow LSE	Yes, HKSE, NYSE
3. Filing of Form 20F with US SEC	Yes	Yes	No	No
4. BOD and structure in place	Yes	Yes	Yes	Yes
5. Gender diversity/employee representatives	Yes	Nominal	No	No
6. Govt. BOD appointees	No	Yes	Yes	Yes
7. Independent BOD members	Yes	Yes	Yes	Yes
8. BOD has power, impact, and independent decision making	Yes	No	Yes	No
9. Disclosure of audited data and other indications of disclosure and transparency	Yes	Yes	Yes	Partial
10. Chair of BOD appointed by state	No	Yes	Yes	Yes
11. Is budget process predictable, and separate from government?	Yes	No	No	No
(B) Public sector governance				
1. Presence of publicly articulated role of hydrocarbon sector with respect to national development objectives	Yes. Well-articulated	Yes. Key to national development	Yes	Yes. Important to state
2. Clear definition of the roles of policy. Commercial operations and regulation and assignment to specific entities avoiding conflict of interest	Yes	Mixed	Mixed	Mixed
3. Presence of a strategy to transfer NOC noncommercial objectives to government or other agencies as capacity becomes available	N/A	No	Donations made to charities	N/A, low involvement
4. Transparent hydrocarbon sector revenue management including revenue distribution within country	Yes	Mixed	Mixed	No

Source: Adapted from the World Bank (2008). A Citizen's Guide to National Oil Companies – Technical Report

As noted from Table 4.25, Statoil ranks high in terms of both corporate and public sector governance, and its Board of Directors composition, autonomy, and diversity are far superior to the other three NOCs analyzed and could be adopted as a benchmark for Aramco's own restructured post privatization Board of Directors and governance model.

While corporate governance is important to the ongoing and future performance of partly privatized NOCs, governments, and, more importantly, investors in these NOCs expect to see better financial performance generated following privatization. Corporate transparency increases as companies are required to publish detailed audited financials which pushes management to continuously aspire to improve their operating performance as they are also peer ranked by international lenders for future borrowing requirements at investment grade or at a better credit rating, as noted for the four NOCs.

It is a widely accepted fact that privatization programs improve efficiency in state-owned institutions (Wolf 2008; Wolf and Pollitt 2008; Sheshinski and Lbpez-Calva 1999; Hodge 2000; Arocena and Oliveros 2012). The next set of figures illustrates that, in general, there are improvements in some key indices.

Fig. 4.30 Pre- and post-privatization NOC assessment. (a) Rising net margin. (b) Net margin pre-privatization vs. post privatization. (c) Operating margin continues to improve. (d) Operating margin: pre-privatization vs. post privatization. (e) Operating profit per BOE trend. (f) Operating profit per BOE: pre-privatization vs. post privatization. (g) Output per employee (per BOE/D). (h) Output/employee: pre-privatization vs. post privatization. (i) Employee growth: pre-privatization (3Y average pre Priv.) vs. post privatization (3Y average post priv.)

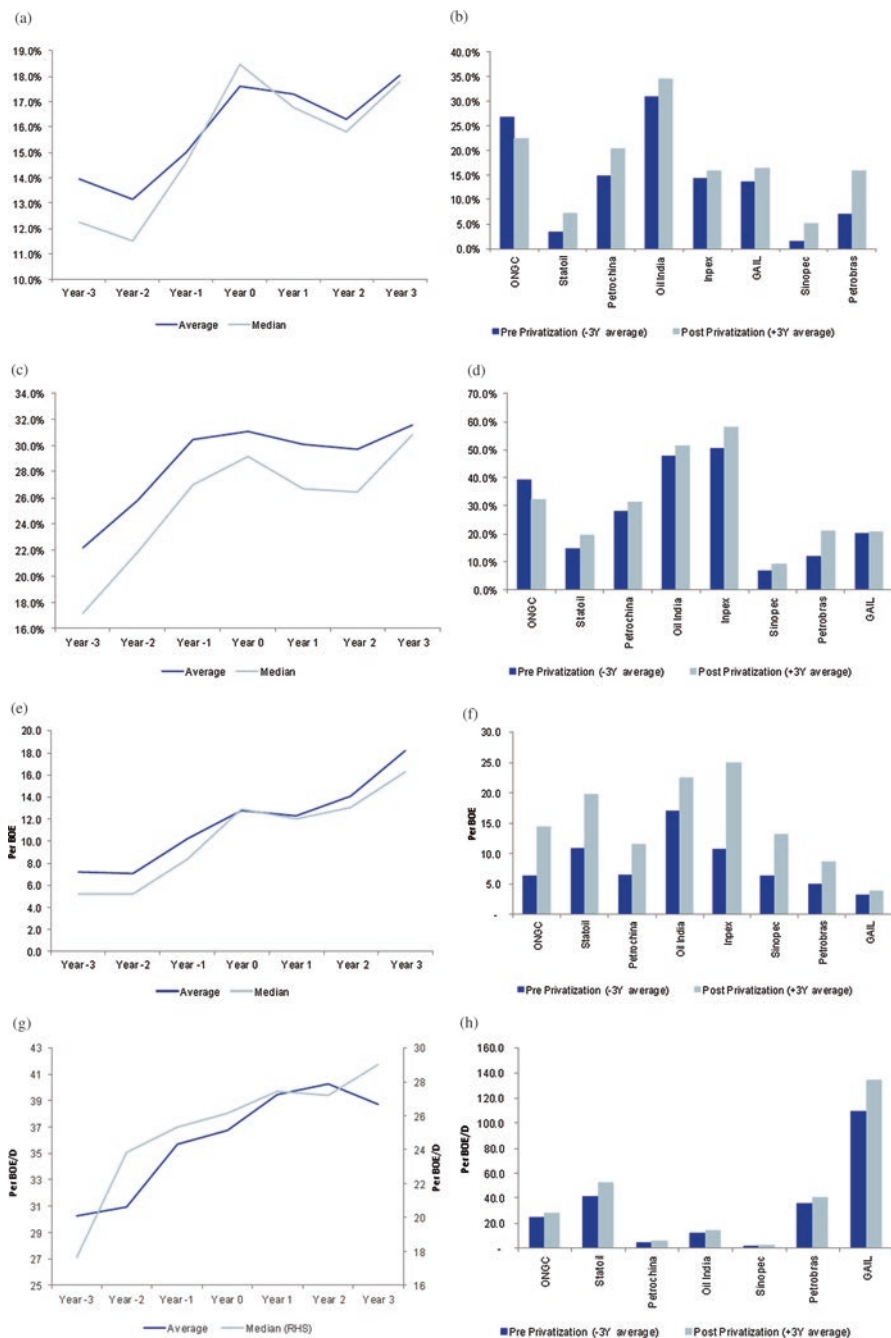
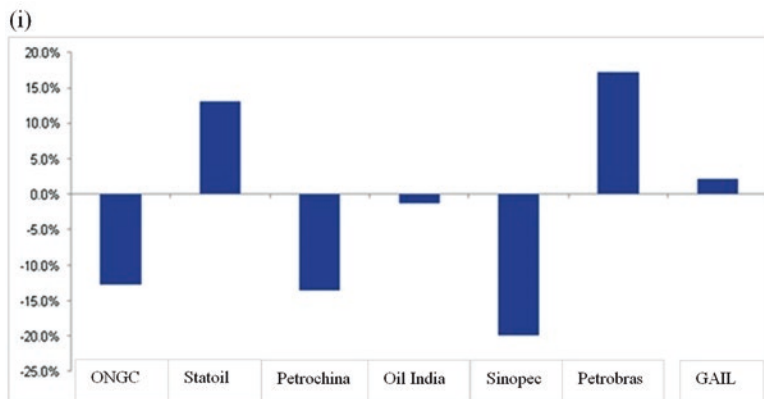


Fig. 4.30 (continued)



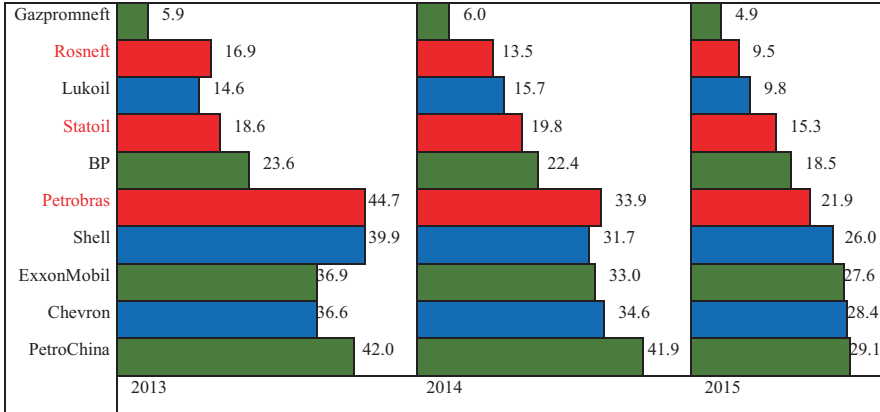
Source: Al Rajhi Capital (2017), Strategy Report, April 2017, pp. 3, 5

While most of the indicators show a positive performance for the selected NOCs post privatization, Fig. 4.30i indicates a mixed employment generation trend, with Sinopec registering a decline, but Statoil and Petrobras increasing their employee numbers. However, the improvement in output per employee and profit per employee as per Fig. 4.30a, h reflects strong labor productivity and efficiency gains following the partial privatization of these NOCs.

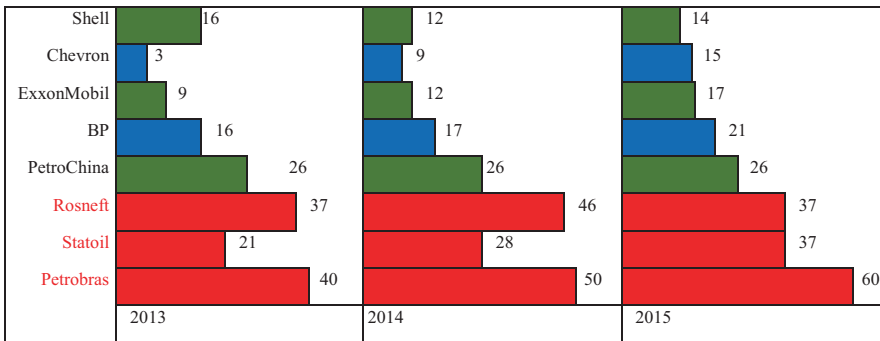
By comparison with international oil companies (IOCs), the partly privatized NOCs seem to lag behind in terms of capital expenditure and financial leverage as noted in Fig. 4.31 but registered lower lifting costs per barrel of oil equivalent compared to the major IOCs.

Fig. 4.31 NOC and IOC comparative performance analysis (2013–2015). **(a)** CAPEX, upstream and downstream (majors), bn \$. **(b)** 2013–2015 financial leverage (gearing): comparative analysis, % . **(c)** Lifting costs, \$/boe

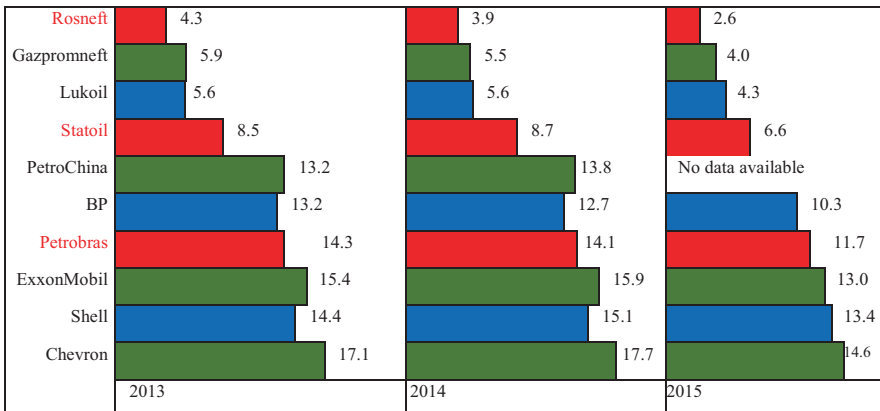
(a)



(b)



(c)



Source: Rosneft Annual Report, 2015, pp. 29, 30

While Fig. 4.31 does not include Sinopec, the inclusion of Petro China, one of the other major Chinese NOCs, is taken as a proxy for Sinopec, given the similarity in corporate and public sector governance and business model. Rosneft however has achieved a dominant position among its peers and IOCs in terms of lifting cost, and in 2015 the company almost returned to its 2011 production cost level of around \$2.5/boe after successfully integrating new assets acquired in 2013. The ability of the IOCs to source capital and generate internal cash flow has enabled them to maintain a superiority in terms of financial leverage over the part privatized NOCs.

In conclusion, the assessment of the four NOCs from Norway, Russia, Brazil, and China has illustrated that there is no “one size fits all” privatization model that meets all the key objectives for initiating a market-led commercialization process for an NOC. This should be borne in mind when we next assess Saudi Aramco’s options to embark on its planned IPO program.

Chapter 5

The Aramco IPO: Governance, Listing, Options, and Policy Implications

The weakest link in the chain is the strongest, because it can break it.

Stanislaw Lec.

Why the Need for an IPO?

Saudi Arabia has made it abundantly clear that it wants to look to a future beyond oil, as the crash in crude oil prices that began in 2014 left the country with a gaping budget deficit, although the National Transformation Plan aims for a balanced budget by 2020 as discussed in earlier chapters. Some of this would be achieved through efficiency reviews of current and planned projects with some SR 17 bn of cost cuts (\$4.53 bn) and savings in the first quarter of 2017 (Arab News 2017a). The key aim was to pursue the reform plans aimed at shifting the economy away from reliance on hydrocarbon revenues and paring back support for a generous welfare state to cope with the reduction in crude prices in the face of a resurgent US shale output.

The driving force for change and plans for a different economic and societal future lay undoubtedly with the young Crown Prince Mohammed bin Salman who has set out to reinvent the Saudi economy by the year 2030 by improving education, trimming the budget deficit, cutting subsidies, fostering new private businesses, and introducing selective value-added taxes. However, it is the proposed sale of a part of the state's crown jewel – Saudi Aramco – that seems to be central to his economic transformation (Mufson 2017; Ignatius 2017). To ensure a successful acceptance by investors of a planned Aramco IPO, the Kingdom abandoned, at least for the time being, the market-led production strategy it initiated in late 2014 and agreed to production quota agreements between OPEC and non-OPEC members to prop up oil prices to ease on budget pressure, with growth in the non-oil economy halting and with calls on the government to stimulate activity and rein in unpopular austerity measures, such as restoring of civil servants' financial allowances (Torchia 2017a; Nereim et al. 2017).

The centrality of an Aramco IPO for the future of the Kingdom was put as a stark choice by the Crown Prince when, in a wide ranging television interview with *Al Arabiya TV*, he bluntly stated that ... “if Aramco is not put for IPO, it means it will take us 40-50 years to develop the mining sector. It will take us 40 years until we

develop the local product and take us long years to develop logistical services, just like we wasted 40 years in the past while trying to develop these sectors ...” (Al Arabiya, 3rd of April 2017). In response to a question about those who fear for Aramco and think it remains state owned and must not be listed for an IPO, the Crown Prince’s response was that such feelings ... “tends to be close to the Socialist and Communist approach where everything is owned by the state...” (Al Arabiya, *ibid*). The goal, according to the Prince, was for an IPO that:

1. *Will not be very far of the 5% level.*
2. *Will be based on two main factors to decide the percentage to be listed: first, whether there will be demand or not, and second, what is available in terms of investments in the pipeline in Saudi Arabia or outside.*
3. *Aramco will be listed on the Saudi bourse in addition to one or more foreign stock exchanges.*
4. *That the Saudi government would retain sole control over Aramco’s oil and gas reserves and would decide on production level.*
5. *Aramco will have a concession to monetize these reserves.*

In a further statement by the Prince, he reasserted that the Saudi government will decide on the production ceiling, that it was in the interest of the Saudi government to increase production and reducing it, bearing in mind that the government “will not take a decision that goes against its interest or the interest of the company regarding the production” (Reuters, 3rd May 2017). To this end, production according to Prince Mohammed bin Salma is not a political decision, but an economic decision, governed by supply and demand, through coordination with OPEC and producers from outside OPEC, so there is no collapse in oil prices (Reuters, *ibid*).

The proceeds of the Aramco IPO are expected to be transferred to the Public Investment Fund (PIF). This entity would be entrusted with diversifying the Kingdom’s investments, which, over time, will become the most important vehicle seeking to generate non-oil investment income. This will be in the mining sector, the domestic arms industry, by reducing the estimated \$60 bn–\$80 bn Saudi Arabia spends annually to buy weapons abroad, by producing automobiles in the Kingdom and creating a domestic entertainment and tourism industries to capture some of the significant Saudi overseas tourism expenditures (Ignatius 2017). The Aramco IPO then cannot be disentangled from the larger goal of both the economic and social transformation of Saudi Arabia (Sfakaniakis 2017), as Prince Mohammed bin Salman has stated and it is worthwhile quoting him in full, “I am young. Seventy percent of our citizens are young and we don’t want to waste our lines in this whirlpool that we were in the past 30 years. We want to enjoy the coming days and concentrate on developing our society and developing ourselves as individuals and families, while retaining our religion and customs. We will not continue to be in the post ’79 era....That age is over” (Ignatius 2017).

The above is indeed a grand vision entailing a generational change in both attitude and the way business and the government works but raises some fundamental questions on the planned Aramco IPO which seems central to this generational transformation.

Issues and Obstacles to Overcome

The year 2018 will be a key year for Prince Mohammed bin Salman's plan for life after oil with the planned Aramco IPO. How will the Prince convince those who believe the IPO is not in the country's interest, should be delayed, changed in substance or even not implemented? The launch of the Vision 2030 in 2016 has started the ambitious Saudi reform program with progress made in certain government procedures, oversight, and openness, bearing in mind that for the Vision 2030 to be accepted by all stakeholders, especially the private sector, it has to be realistic, clearly formulated, and ambitious in what it wants to achieve, but, above all, decisive in its identification of challenges and obstacles. Leading Saudi business groups' Executives, like Lubna Al Olayan of the Olayan Group, while praising the more cooperative discussions between the government and the local business community, also admitted that the private sector has found the execution of the vision "too much to absorb" in such a short period of time (Nereim and Abu-Nasr 2017).

The government's response to public disquiet about the Aramco IPO was to restate some of its basic objectives:

- *Aramco will remain a Saudi company that contributes to the domestic economy.*
- *Saudi Arabia will not give up on its majority ownership of the company and will not relinquish the control of it as the owner of largest proportion.*
- *Saudi citizens will be given priority for the IPO by offering shares at preferential prices on the Saudi Stock Market, Tadawul.*
- *IPO proceeds will be invested in the development diversification of the Kingdom's economy and will raise its sustainability.*
- *Aramco IPO will raise transparency of the company and the efficiency of its business (Carey and Nereim 2017).*

Other objectives were set out by Prince Mohammed bin Salman, including:

- *Part of the government's returns is the tax on the oil (50%) that is sold or produced. There are also taxes it takes from Aramco. The government's interest is to increase Aramco's profit.*
- *Any reduction in tax revenues arising from lowering of the Aramco tax rate from 85% to 50%, will be replaced by stable dividend payments and other sources of revenue from hydrocarbon producers to the government.*
- *The government is selling the value of the company, estimated at \$2 trillion. The wells are owned by the government, and only the company has the right to benefit from these wells.*
- *Aramco will benefit from enhanced transparency, corporate governance, and counter corruption if any and be responsible to investors through its general assembly.*
- *Aramco will be transformed from an oil and gas company to an energy/industrial company.*

(The Economist 2016; Reuters 2017; Al Arabiya 2017)

The above is certainly a long and persuasive list for why an Aramco IPO is necessary for the Kingdom's strategic economic and social transformation. However, the lack of more specific details surrounding the above "wish list" has led to some doubts and misgivings on whether the majority of the "wish list" could actually be realized, with some openly criticizing on social media the sale of "the hen that lays the golden egg" or the "cash cow" (Kerr and Al Omran 2017; Fattouh and Harris 2017; Watkins 2017). Other doubts raised concerned the desired valuation target of \$2 trillion, (Boslego 2017a), the amount of actual oil reserves in Saudi Arabia (Kemp 2017a; Boslego 2017b, Svenda 2017), and the governance (Said et al. 2017; Watkins 2017). However, as some have noted, a bet on the Saudi Aramco IPO is a bet on how successfully one thinks that Saudi Arabia, in an era of lower oil prices and uncertainty about long-term oil demand, will adjust its economy and diversify its economic base (Fattouh and Harris 2017, p. 3).

Fattouh and Harris also differentiate between *economic diversification* and *financial diversification* in the sense that an Aramco IPO will diversify the sources of income that will come about by providing the Public Investment Fund, the state's sovereign wealth fund, with the proceeds of the Aramco IPO with the aim of obtaining high returns from its diverse domestic and international investment, such as the US\$3.5 bn investment in *Uber*, aiming to make the PIF the world's largest sovereign wealth fund (Kerr 2017). Fattouh and Harris, however, seem to hedge their bet on whether the PIF investments can achieve better social returns by accelerating the diversification of the Saudi economy through such financial diversification and "only time will tell," as the success of the Aramco IPO should not be assessed separately from the performance of the PIF, its governance structure, transparency in decision-making process, the quality of its investment portfolio, and the competence and accountability of its fund managers and management team (Fattouh and Harris 2017, pp. 7, 8). Table 5.1 summarizes the main IPO objections and issues of concern, as well as setting out potential solutions, many of which will be examined in further detail in the sections that follow.

Table 5.1 Aramco IPO major concerns and potential solutions/remedies

IPO concerns	Potential solutions and remedies
<ul style="list-style-type: none"> • The size of Saudi Arabia’s hydrocarbon reserves is creating some doubts 	<ul style="list-style-type: none"> • The size of the Saudi reserves can be established if an independent reserve audit is carried out that has access to a variety of data on current depletion rates from a wide sampling of wells and reserves growth data to assess differences between proved, probable, and possible reserves in compliance with both Society of Petroleum Engineers definitions and more vigorous US Securities and Exchange Commission rules
<ul style="list-style-type: none"> • Board transparency and accountability to new investors will be difficult to realize 	<ul style="list-style-type: none"> • A new Saudi Aramco board and governance structure can be established, based on best international practice to ensure that independent board members have an effective voice and Aramco can publish audited annual accounts according to international standards, preferably to US SEC 20-F Annual Reports
<ul style="list-style-type: none"> • The proposed tax structure will stress government public financing and lead to revenue uncertainty 	<ul style="list-style-type: none"> • The proposed lower level 50% tax rate could possibly stress public financing, especially if a regular dividend payout policy is not implemented, with one that becomes dependent on oil price fluctuations
<ul style="list-style-type: none"> • The Saudi Aramco valuation will be based on the size of reserves 	<ul style="list-style-type: none"> • The final valuation will be based on free cash flow or discounted future cash flow basis, but this will also depend on accurate information on cost of production, realistic projected oil prices, revenues from different subsidiaries, and disentangling Aramco from government revenues
<ul style="list-style-type: none"> • The proceeds from selling “the crown jewel” of Saudi Arabia might not be well utilized by the PIF 	<ul style="list-style-type: none"> • The PIF has been undergoing both structural and management changes, and the government has announced that at least half of the IPO proceeds will be invested in the domestic Saudi economic sectors to create local employment, and growth in the SME sector
<ul style="list-style-type: none"> • Aramco’s noncore corporate social activities might be abandoned post IPO 	<ul style="list-style-type: none"> • Aramco could consider several model of ensuring that elements of its CSR remains post IPO, whether by hiving off noncore activities into a separate subsidiary in cooperation with the private sector or transferring these to competent third parties to manage, but to make charitable contribution or continue with the current model based on cost-effectiveness and Aramco management involvement
<ul style="list-style-type: none"> • A post-Aramco IPO would push for a reform of current domestic energy prices 	<ul style="list-style-type: none"> • The government has announced that it intends to carry out an energy subsidy price reform prior to the Aramco IPO which will have implications not only for reducing domestic energy consumption but also in promoting energy efficiency, which could release hydrocarbon resources for exports while at the same time protecting key industrial and manufacturing sectors by staggering price changes, including Aramco’s petrochemical subsidiaries
<ul style="list-style-type: none"> • Foreigners will buy the majority of shares in the IPO, and Saudi Arabia will loss ownership of Aramco 	<ul style="list-style-type: none"> • The government has clearly stated that the majority of shares will be sold to Saudi citizens at preferential prices and that the Saudi government will remain the majority owner of around 95%, through the PIF’s ownership of Aramco’s majority shareholding

(continued)

Table 5.1 (continued)

IPO concerns	Potential solutions and remedies
<ul style="list-style-type: none"> • Aramco’s oil production policies will be determined by the new investors post IPO 	<ul style="list-style-type: none"> • Aramco’s oil production policies will still be determined by the government’s overall strategic economic and international obligations and agreements but bearing in mind that it could make the company open to antitrust legal action, especially if it is listed on foreign exchanges like the NYSE with strong antitrust legislation
<ul style="list-style-type: none"> • Aramco should be listed only in the <i>Tadawul</i> Saudi Stock exchange 	<ul style="list-style-type: none"> • The plan is for a listing in the <i>Tadawul</i> exchange plus one or two more international listings, as the local stock market does not have the necessary depth or liquidity to absorb a size of the Aramco IPO and to enable Aramco to attract foreign capital inflow, the ability to borrow at competitive rates internationally and ensure that it meets with international reporting and governance standards

In releasing its new audited accounts for listing purposes, Aramco has to provide detailed information on its various operating business segments like exploration and production, refining, marketing and distribution, chemicals, corporate activities, as well as intergroup transfer pricing methods. Each segment’s profit and loss accounts as well as assets and liabilities will also have to be disclosed to assess their profitability. For the first time, this will shed some light on whether these different segments are operating on a commercial profit and loss basis or on a cost center basis. Besides the concerns listed above, there is also the prospect of entanglement by Aramco in lawsuits filed in the USA by relatives of the 9/11 attacks against Saudi Arabia under the so-called JASTA (Justice Against Sponsors of Terrorism Act) legislation, potentially affecting Aramco’s assets in the USA, or proceeds from a US Stock Market listing, although the Saudi government has strenuously denied any official involvement, and even the 9/11 commission report found “no evidence that the Saudi government as an institution or senior Saudi officials individually funded” the attacks (The Associated Press 2017).

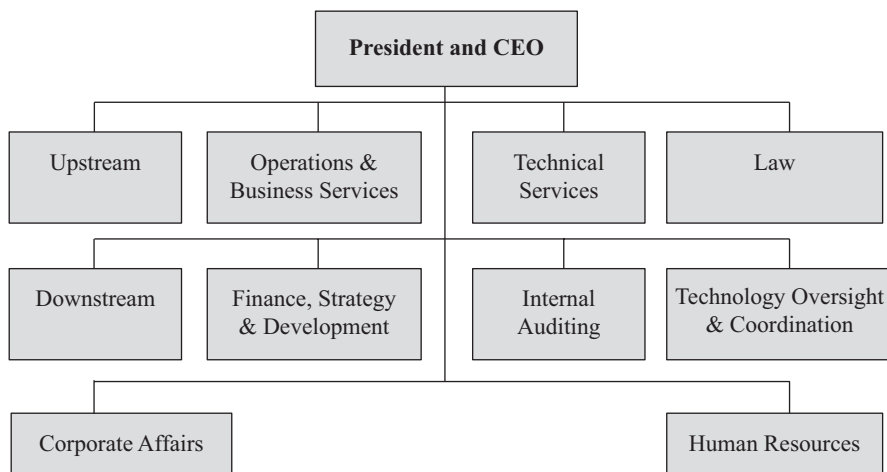
Aramco’s Key Asset: Its People

As Saudi Aramco has admitted, the company’s success is dependent upon Saudi Aramco’s ability to attract and retain key personnel. In particular, senior Aramco managers must possess considerable experience and knowledge of the energy industry, and the loss of some of them or the inability to attract and retain enough qualified staff could adversely affect the ability to implement Saudi Aramco’s business strategy or develop existing or new business (Saudi Aramco 2017e, p. 18; Saudi Aramco 2016a). The company notes that its future success depends on Saudi Aramco’s continued ability to identify, hire, train, and retain qualified personnel in

sales, marketing, operations, and legal positions. As Aramco prepares for its IPO, the issue of its senior and middle management and their ability to assume new Aramco roles will become important, given that there will be a change in emphasis from a state-owned and state-led NOC to a partly privatized NOC dealing with multiple stakeholders and regulatory authorities, especially if an international listing is also undertaken. While there is understandable focus on senior management at the SVP and VP levels and their functional ability, any organization undergoing a fundamental transformation change has to ensure that its middle management are also fully onboard and behind new visions and objectives. For Saudi Aramco this could also involve a change in its business approach and moving it toward a culture of profit and loss (P&L) and bottom-line accountability, as opposed to a more typical NOC cost center management approach, but that the inoculation of a new P&L approach often takes time, with internal stakeholder “buy-in” facing resistance to change. According to some studies, it has been observed that some workers leave an organization facing uncertain changes, especially those undertaking privatization transformation (Megginson and Netter 2001; Hodge 2000).

For Saudi Arabia, there is anecdotal evidence that public sector companies facing privatization plans or undergoing actual commercialization, such as the Saudi Arabian Airlines and Saudi Telecom Company (STC), saw a rise in employees requesting early retirement, as well as an influx of new younger entrants. These phenomena could also affect Saudi Aramco should a sizeable number of experienced middle management employees decide to opt for early retirement, leaving a void in experience especially in skilled technical roles, which will take time to be fully mastered by younger graduate entry (Nasser 2014). Saudi Arabia possesses the means to ensure that local universities like KFUPM, King Saudi University, and King Abdul-Aziz University and students sent on overseas scholarships are available in the various engineering disciplines to fill Aramco positions made vacant through early retirement, especially those at junior entrant levels, but a large-scale middle management void could potentially affect Aramco's operations in the short to medium term. One way to overcome and reduce resistance to the planned Aramco IPO is for the company to conduct regular employee and management briefings and hold “town hall”-type meetings to answer questions on progress of the IPO and not leave this to the last moment.

For management purposes, Saudi Aramco is organized into distinct business units based on the main type of its core business activities in line with what was noted for the partly privatized NOCs discussed in the previous chapter. Figure 5.1 sets out the company's broad organizational structure.

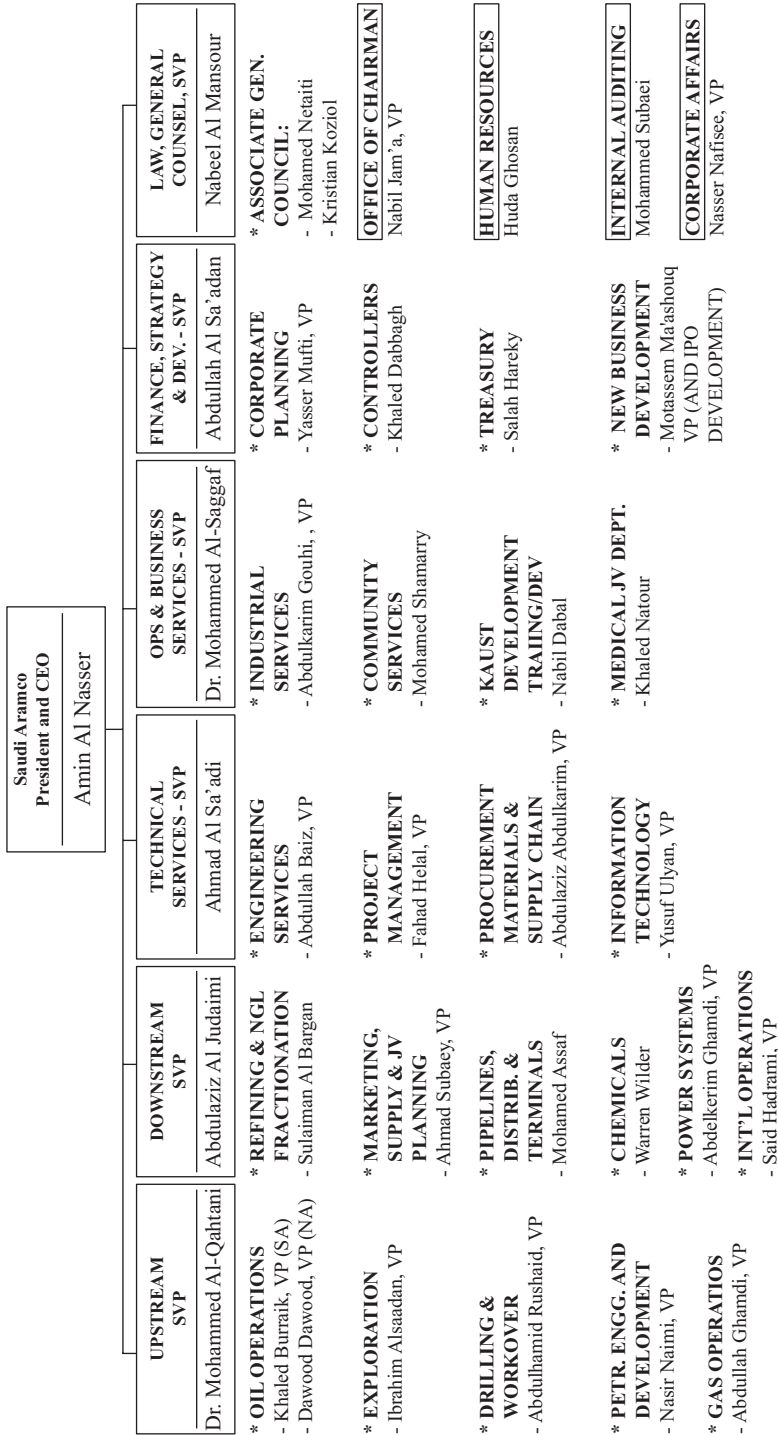
Fig. 5.1 Saudi Aramco organization structure (Oct. 2017)

Source: Saudi Aramco (2017e): Saudi Aramco Sukuk Issuance Program, p. 32

Aramco's upstream activities include oil and natural gas exploration, field development, and production, while the downstream activities include refining, manufacturing, marketing, transportation, and production of crude oil, petroleum, petrochemicals, and products and related services to both wholesale and retail customers. Other key units directly reporting to the Aramco CEO Mr. Amin Nasser are law, finance, strategy, and development as well as internal auditing, corporate affairs, technology oversight, and human resources. It is worth noting that Aramco's human resources unit is headed by the company's most senior female employee, Ms. Huda Al Ghoson, joining other senior Aramco female employees like former VP Engineering Services Nabila Al Tunisi, and Treasury Advisory Manager Sheila Al Rowaily, with Saudi Aramco seemingly committed to a more gender diverse workforce (Saudi Aramco 2016b – Annual Review 2015).

Figure 5.2 breaks down Aramco's major operating units by different business lines to illustrate the complex nature of these units and the necessary management and technical skills required to manage them.

Fig. 5.2 Aramco organization structure by major operating units and business lines



Source: Aramco (2017e), Annual Report 2015, Saudi Aramco "Arabian Sun" various editions

A successful organization is often one that rotates key managers to different functional responsibilities to ensure that they possess a wide range of skills and so better understand other unit's responsibilities in order to avoid a "tunnel vision" or silo mentality to develop. Table 5.2 summarizes the background and multifaceted experience of some of the Aramco Senior Executives, with the company announcing several new appointments at the SVP and VP levels in preparation of the planned Aramco IPO (Mahdi 2017a; Saudi Aramco 2017e).

Table 5.2 Saudi Aramco Senior Executives' professional experience and background

Name and function	Background and experience
(A) President and CEO – Amin Al Nasser	<ul style="list-style-type: none"> • President and CEO since 2015 and Director of Saudi Aramco since 2010 • Held several leadership positions in Aramco, including SVP Upstream • Member of International Advisory Board of KFUPM, Board of Trustees of KAUST, MIT Presidential CEO Advisory Board, and JPMorgan International Council • Holds a bachelor's degree in petroleum engineering from KFUPM and completed Senior Management Executive programs at Columbia University
(B) SVPs • Nabeel Al Mansour, SVP and General Counsel	<ul style="list-style-type: none"> • Promoted to SVP in May 2017 and General Counsel in 2016, beginning his career with Aramco in 1988 • Served as legal advisor to the Kingdom's Natural Gas Initiative • Led the team that negotiated the renewal of the oil concession agreement between Saudi Arabia and Chevron and development of SADARA • Obtained a Juris Doctor degree in law from Oklahoma City University, USA, and participated in management programs at Oxford and Harvard Universities
• Dr. Mohamed Al Qahtani, SVP, Upstream	<ul style="list-style-type: none"> • Appointed SVP Upstream in January 2016. Joined Aramco in 1983 and held management positions in Upstream, gas production, engineering, reservoir management, simulation, and production facilities development • Former Chairman and CEO of Aramco Services Company and Chairman of Saudi Refining Inc., Houston, as well as Aramco's Chief Petroleum Engineer; VP, Saudi Aramco Affairs; and VP, Corporate Planning
• Abdulaziz Al Judaimi, SVP Downstream	<ul style="list-style-type: none"> • Appointed SVP Downstream in May 2017 • Chairman of the Board for Motiva Enterprises, USA, and Petro Rabigh and Board Representative on SATORP and Saudi Electricity Company • Previous positions included VP of Power Systems, Corporate Planning, Chemicals and New Business Development, and VP of Northern Area oil operations • Worked with Saudi Arabian Marketing and Refining Company (SAMAREC) • Holds bachelor's degree in science from KFUPM and MS in business administration from MIT Sloan School of Management

(continued)

Table 5.2 (continued)

Name and function	Background and experience
<ul style="list-style-type: none"> • Ahmad Al Sa'adi, SVP, Technical Services 	<ul style="list-style-type: none"> • Appointed SVP Technical Services in 2016 after joining Aramco in 1981, • Chairman of SAMREF • Previous roles included VP Gas Operations, and VP Pipelines, Distribution and Terminals. He also held the position of Chief Engineer and President and CEO of Aramco Gulf Operations Company
<ul style="list-style-type: none"> • Dr. Mohammed Al Saggaf, SVP Operations and Business Services 	<ul style="list-style-type: none"> • Appointed SVP in 2016 with a portfolio spanning Saudi Aramco's activities in community, aviation, marine, transportation, training, safety, security, and medical services • Current Chairman of SATORP and Saudi Aramco Energy Ventures (SAEV) • Prior to this he was President of KAPSARC and held previous positions in Upstream and Aramco's Corporate Innovation Board
<ul style="list-style-type: none"> • Abdullah Al Saadan, SVP, Finance, Strategy and Development 	<ul style="list-style-type: none"> • Appointed to the position in 2014 • Chairman of Services Review Committee, John Hopkins Aramco Healthcare Company, and Chairman of Aramco Trading Company • Has been with Aramco for 35 years and was a former President and CEO of SAMAREF, VP of Information Technology, VP Gas Operations, VP Engineering Services, and VP Corporate Planning • Member of Aramco's Management Committee, Strategy Council and Conflict of Interest and Business Ethics Committee
(C) <i>Vice Presidents</i>	
<ul style="list-style-type: none"> • Abdulhakim Al Gouhi, VP, Industrial Services 	<ul style="list-style-type: none"> • 34 years of diversified experience with Aramco ranging from oil and gas production to downstream operations involving terminals, refining, supply planning, hydrocarbon transportation, marketing, and joint ventures • Served as MD and President of Motor Oil Hellas, a JV in Greece and President of SASREF refinery as well as General Manager of Ras Tanura refinery • Graduated with a bachelor's degree in mechanical engineering from KFUPM and completed an Executive Management Program at the University of Pennsylvania
<ul style="list-style-type: none"> • Said Al Hadrami, VP, International Operations 	<ul style="list-style-type: none"> • Responsible for Aramco's International refining and marketing portfolio and Aramco overseas subsidiaries • Previous President and CEO of Saudi Aramco Trading Company • Started his career with Aramco in 1990 in the Treasury Department and moved to Downstream Development and Products Sales and Marketing as well as former President and CEO of SATORP, as well as international experience with MOTIVA, USA; Saudi Petroleum Overseas Ltd, UK; Avin Oil in Greece; Motor Hellas, Greece, with board duties with Saudi National Shipping Company; and S-Oil Corporation in South Korea • Bachelor's degree in industrial management from KFUPM as well as MBA from the same university and completed the Harvard General Management Program

(continued)

Table 5.2 (continued)

Name and function	Background and experience
<ul style="list-style-type: none"> • Ahmed Al Subaey, VP, Marketing and Supply Planning 	<ul style="list-style-type: none"> • Previous to this role, Subaey had been Executive Director of the Strategic Transformation Office, overseeing the implementation of the Accelerated Transformation Program • He held positions as CEO of the Saudi Petroleum International Inc. in New York and Head of Saudi Petroleum Ltd in Tokyo, as well as CEO of S-Oil in Korea • Besides the above, he has worked in various Aramco departments since 1981 in Upstream and Downstream operations, ranging from project management to engineering department • Graduated with a bachelor's degree in electrical engineering and attended the advanced degree program leading to a master's degree in electrical engineering from Arizona State University
<ul style="list-style-type: none"> • Salah Al Hareky, Treasurer 	<ul style="list-style-type: none"> • Appointed to this position in 2015 • Previous positions with Aramco since 1989 included Administrator of Corporate Finance, Senior Auditor and Manager of Treasury Services and Treasury Advisory, as well as Managing Director of Saudi Petroleum Overseas Ltd. (SPOL) • He has represented Aramco on several boards, including Vela International Marine Ltd. and Red Sea Refining Company (YASREF), and currently serves on SATORP and S-Oil Korea Boards • Graduated with an MBA from KFUPM and the General Management Executive Program at Harvard University and the Economic of Oil Program in London
<ul style="list-style-type: none"> • Dr. Abdullah Al Baiz, VP, Engineering Services 	<ul style="list-style-type: none"> • Prior to this appointment in May 2017, he was Chief Engineer and General Management of Ras Tanura refinery, as well as President of SASREF, and President and CEO of LUBREF another Aramco JV lubrication base oil manufacturing and marketing company with plants in Jeddah and Yanbu • He was previous manager of Gas Domestic Marketing, managing the Kingdom's gas and NGL supply and demand outlook as well as Manager of Hawiyah Gas Plant • Served on the boards of PETRON, a JV in the Philippines and YASREF, as well as current Aramco representative in the Saudi Energy Efficiency Program (SEEP) and the National Authority for Clean Development • Holds a Ph.D. in mechanical engineering from University of Colorado and both a B.Sc. and M.Sc. in engineering from California State Polytechnic University, as well as attending the Stanford Executive Program
<ul style="list-style-type: none"> • Abdullah Al Ghamdi, VP, Operations 	<ul style="list-style-type: none"> • Prior to being appointed to this position in May 2017, he previously served as General Manager of the Northern Area Gas Operations and Manager of Abqaiq Plants Operations, as well as Manager of Oil Supply, Planning, and Scheduling (OSPAS), • He also served as Manager of Riyadh Refinery • He obtained a B.Sc. in electrical engineering from King Saud University and completed the Virginia Darden Executive Program and the Oxford Energy seminar in the UK

(continued)

Table 5.2 (continued)

Name and function	Background and experience
<ul style="list-style-type: none"> • Ahmad Al Khowaiter, VP, Technology Oversight and Coordination 	<ul style="list-style-type: none"> • Prior to being appointed to this position in May 2017, Al Khowaiter served as Chief Technology Officer of Saudi Aramco and was Manager of Facilities Planning and led the development of the master plan for King Abdullah University of Science and Technology (KAUST) and served as “Interim Provost” • Other Aramco positions held included Director of New Business Evaluation and Chief Engineer and Executive Director of Power Systems • He completed a B.Sc. degree in chemical engineering from KFUPM and a M.Sc. degree in chemical engineering from the University of California and attended the MIT’s Sloan Fellowship Program, earning an MBA
<ul style="list-style-type: none"> • Yasser Mufti, VP Corporate Planning 	<ul style="list-style-type: none"> • Prior to his appointment to this position in May 2017, Mr. Mufti was Executive Director of New Business Development, and prior to that he was President and CEO of Aramco Trading Company • He also led the Strategic Transformation Office and from 2012 to 2013, served as Saudi Arabia’s Governor to OPEC and Advisor to the Oil Minister, and was appointed as Chairman of OPEC’s Board of Governors in 2013 • He serves on the boards of Johns Hopkins Aramco Healthcare Company, Saudi Arabian Industrial Investment Company, Saudi Aramco Energy Ventures, and Saudi Aramco Entrepreneurship Center (WA’ED) • He holds a M.Sc. degree in business administration from City University, London, and a B.Sc. in electrical engineering from KFUPM and attended Executive Development Programs at Kellogg School of Management at Northwestern University in Illinois
<ul style="list-style-type: none"> • Abdulhameed Al Rushaid, VP, Drilling and Workover 	<ul style="list-style-type: none"> • Prior to his appointment to this position in May 2017, Mr. Rushaid had been serving as Chief Drilling Engineer as well as Manager in the Upstream Venters Department overseeing the Lukoil-Saudi Aramco JV, as well as Manager of Development Drilling Operations for the Northern Area and Offshore Drilling and Producing Divisions • He is a Board Member of Aramco Gulf Operations Ltd., Khafji Joint Operations, Saudi Petroleum Services Polytechnic, and Saudi Aramco Upstream Technology, as well as Chairman of ARO Drilling, a new in-kingdom offshore drilling joint venture • He obtained his B.Sc. degree in petroleum engineering from KFUPM and completed the University Executive Program from the International Institute for Management Development (IMD) in Lausanne, Switzerland
<ul style="list-style-type: none"> • Yusuf Al Ulyan, VP Information Technology 	<ul style="list-style-type: none"> • Prior to his appointment to this position in May 2017, Mr. Ulyan held various positions with Aramco since 1987 as administrator of TCC operating systems, EDP applications, and systems consultant with SAP Computer Center, and Manager of the Support Services Application Department and of the EXPEC Network Operation Department • He served for 3 years on the Board of Directors with Aramco Services Company • He graduated from KFUPM with a B.Sc. in computer science and completed the Executive University program from INSEAD Business School in France and attended the Oxford University Energy Seminar and Saudi Aramco Management Development Seminars in Washington

(continued)

Table 5.2 (continued)

Name and function	Background and experience
<ul style="list-style-type: none"> • Mohamed Al Netaiti, Associate General Counsel 	<ul style="list-style-type: none"> • Mr. Netaiti was appointed to this role in May 2017 and will lead legal specialties, having previously led the International Trade Practice in the Aramco Law Organization and is a 25-year veteran of Aramco, joining in 1992 • He completed engineering assignments in Ras Tanura refinery, Juaymah Terminal, and power distribution and mechanical shops, worked as a risk Engineer, and completed assignments with Aramco Services Company and Aramco Overseas Company • He led a legal team supporting the Kingdom's petrochemical industry in multiple international jurisdictions and participated in establishing the Law Transformation Office in 2012 and led this office in 2013 and appointed to lead the international trade practice • He graduated with an electrical engineering degree from the University of Portland, Oregon, and completed a number of management and executive development programs including the management development seminar and Executive Education at Harvard Business School
<ul style="list-style-type: none"> • Kristian Koziol, Associate General Counsel 	<ul style="list-style-type: none"> • Mr. Koziol was appointed to this role in May 2017 and will oversee the project development, finance, and tax and benefits legal practice areas • He joined Aramco in 2005 and was part of the legal teams that worked on the SADARA, LANXESS project that created the ARLANEXEO joint venture, and the division of the MOTIVA joint venture into a wholly owned Aramco entity • From 2013 to 2017, he led the 20 member project development and finance legal practice area responsible for joint venture development, project corporate finance, mergers and acquisition, capital markets, and venture capital • He holds an MBA from the University of Virginia, a Juris Doctorate from the Texas School of Law, and a bachelor of science degree from Georgetown University
<ul style="list-style-type: none"> • Motassim al-Maashouq, VP New Business Development and IPO Development 	<ul style="list-style-type: none"> • Appointed as IPO Development VP in April 2017 • Former Treasurer and CEO of Aramco's Philippines affiliate Petron Corp • Chairman of Saudi Aramco Lubref. • Non-Executive Director of Petro Rabigh • Former President and CEO of Saudi Arabian Lubricating Company and served as Senior Planning Analyst at Aramco's Washington office • Former Planning Coordinator in Corporate Planning Department and Acting Manager of Business Analysis Department • Holds an MA in Economics from University of London and attended Stanford University Executive Program

As noted from Table 5.2, Saudi Aramco promoted many of the above listed Vice Presidents during its Shanghai Board meeting in May 2017 with the planned IPO in mind (Saudi Aramco 2017b; Mahdi 2017a). The appointment of an experienced Aramco veteran, Mr. Motassim al-Maashouq as overseeing the IPO development Office in April 2017, also illustrated the seriousness by which the company was taking the matter, as Maashouq has extensive experience in corporate planning and is a former Treasurer and is well connected within the financial community (Shamseddine 2017a).

In assessing Aramco's senior management profile, one can deduce key salient features that make the company an institutional "island of management efficiency" in its day-to-day operations (Hertog 2013). From the background of the team, Aramco's managerial capacities seem unrivaled in Saudi Arabia and put it on par with some of the most advanced international oil companies, with the following common Aramco executive management traits standing out:

- *Highly educated professionals, with engineering background, mostly graduates of King Fahd University of Petroleum and Minerals (KFUPM), complemented with further advanced international executive management courses at world renowned institutions*
- *A unique on-the-job rotation experience in different Aramco business lines, whether in Upstream, Downstream, marketing, or corporate planning and finance, ensuring management interchangeability with multi-business experience*
- *One or more senior board level membership with both fully owned and international and domestic joint venture entities*
- *CEO and general management responsibilities with Aramco subsidiaries, providing exposure for complex operational oversight and strategic transformation experience*
- *Company loyal and long-serving career Aramco employees, providing stability and continuity*

The above has enabled the company to maintain a high level of operational autonomy as well as its unique "Aramco" cultural autonomy, with its managers and employees held in high esteem in the international petroleum business. Besides the above noted Aramco executives, the other senior management responsible for the domestic and international joint ventures are listed below in Table 5.3.

Table 5.3 Saudi Aramco joint ventures Chief Executives' profiles

Joint venture and CEO	
<ul style="list-style-type: none"> • SADARA: Dr. Faisal Al-Faqeer, CEO 	<ul style="list-style-type: none"> • Dr. Al-Faqeer was appointed as CEO on 1st October 2017, replacing Ziad Al Labban • He has been a Non-Executive Director of <i>Sadara</i> Chemical Company since January 01, 2017 • Prior to his appointment, he lead the Operations Department at the <i>Ras Tanura</i> Refinery bringing with him many years in the oil and gas industry and the downstream sector, including assignments with Engineering Consulting Services, Research and Development and refining with Aramco • Holds a Master Degree and a Doctor of Philosophy in Material Science and Engineering from Pennsylvania State University
<ul style="list-style-type: none"> • YASREF: Abdullah Subaiyyal, President and CEO 	<ul style="list-style-type: none"> • Appointed to the position in January 2017, with over 35 years of service in the oil and gas industry • Previous assignments included as a process engineer at Rabigh Refinery for 18 years with PETROMIN and represented Saudi Aramco to the development of FUJIAN Project in China for 13 years • Holds a B.Sc. degree in chemical engineering from KFUPM
<ul style="list-style-type: none"> • S-Oil, South Korea: Othman Al Ghamdi, CEO 	<ul style="list-style-type: none"> • Appointed to the position in September 2016 with over 25 years of service with Aramco • Prior to this appointment, he held key Aramco positions such as Chief Engineering Manager at Ras Tanura refinery and Operation Manager at Ras Tanura refinery • Holds a B.Sc. degree in chemical engineering from KFUPM and an MBA from the same University
<ul style="list-style-type: none"> • Petro Rabigh: Nasser Al Mahasher, President and CEO 	<ul style="list-style-type: none"> • Appointed to the position in September 2016, with over 28-year experience in the refining and petrochemical sectors • Prior to this appointment, he held senior positions as CEO of South Korea's S-Oil for 4 years, and head of Saudi Petroleum Ltd., Tokyo, managing marketing activities for Saudi Aramco • He was also made Adjunct Professor of Chemical and Biological Engineering by Seoul National University in South Korea • Holds a bachelor's degree in chemistry from East Michigan University, USA, and a master's in chemical engineering from Wayne State University, USA, and an executive MBA from the International Institute for Management Development (IMD), Switzerland
<ul style="list-style-type: none"> • SATORP: Fawwaz Nawwab, President and CEO 	<ul style="list-style-type: none"> • Appointed to the position in 2011 as President and CEO of the Saudi Aramco Total Refining and Petrochemical Company with over 33 years of experience • Mr. Nawwab also served as CEO and President of Saudi Aramco Mobil Refinery Company Ltd. (SAMAREF)

Source: Company sites, Saudi Aramco "Arabian Sun" various editions

Once again, the summary bios of the CEOs of the Saudi domestic and international joint ventures illustrate that the incumbents are long-serving Aramco employees with diverse engineering background in both upstream, but primarily downstream sectors, and have extensive board and executive management experience in dealing with foreign partners. This is important for Aramco's planned IPO as there is a possibility in adding some or all of the company's downstream petrochemical and refining units to the IPO, and having experienced management running these operations increases potential investor confidence.

Meeting Effective Governance and Oversight

The Saudi approach to the nationalization of its oil sector was different from the other countries we assessed in the previous chapter. In Saudi Arabia the energy sector had been run for many years by a consortium of major IOC's, the Arabian American Oil Company or Aramco. Nationalization of Aramco in the 1970s was gradual and non-acrimonious, and Saudi Aramco, the NOC, replaced Aramco, but many of the Aramco companies continued as advisors to Saudi Aramco ensuring continuity of management strengths and technical skills, and it is not uncommon to find second- and third-generation American and other expat *Aramcons* working with the company. This smooth transition has also ensured that a distinct Aramco corporate "culture" has remained strong. Policies since nationalization have also been similarly unique, and Aramco has been left very much to itself on operational matters (Hertog 2013), and this has resulted in a high degree of technical professionalism in the company as evidenced from the assessment of Aramco's senior management. While, as will be discussed, there is a high degree of internal accountability, external transparency and accountability will also be highlighted in terms of Aramco's current governance structure and the need for meeting a foreign IPO listing requirement.

Possessing an appropriate corporate governance structure is important for any company contemplating an international IPO, as many studies have demonstrated that a home country's institutional environment significantly affects foreign firms' valuations and ultimately the success of their IPO (Bell et al. 2014). These studies indicate that an IPO firm should respond to an international listing by enhancing its governance mechanisms, such as board monitoring and executive incentives, and reduce informational "asymmetries," i.e., withholding of information to outsiders, so as to convey the company's quality to investors and ultimately improve its stock market value. In countries with strong domestic regulations lacking, investors may suspect that insiders or controlling shareholders may be diverting resources from the company to the detriment of minority investors and would negatively affect a firm's IPO legitimacy. As such, similarities between a foreign IPO's home and potential host market's regulatory institutional rules and regulations reduce investor uncertainties and their need to rely on the firm's internal compliance with multiple governance mechanisms. In order to achieve a high level of legitimacy, and consequently an IPO valuation, the IPO firm must deploy a wider range of governance practices to reassure investors in advanced stock market governance regimes such as the New York Stock Exchange or the London Stock Exchange that their interests are well protected.

In the words of Saudi Aramco, "our behavior is what defines us – as a company, as employees and as people ... as we continue to strive to be the world's leading integrated energy and chemical company, everything we do is anchored by our corporate values: Integrity, Safety, Accountability, Excellence and Citizenship" (Saudi Aramco, Annual Report 2015, Governance).

The company sets out its overall governance policies as follows:

- *The corporate governance structure is the mechanism that helps define Aramco's its strategic direction to ensure industry leadership.*
- *The company's standards and integrity flows from its Board of Directors, which encompasses a wealth of diverse experience and a future-oriented mind-set.*
- *The Board demands that management adheres to the highest personal and professional ethical standards and ensures regular reporting and best-in-class independent auditing practices.*
- *The independent audit process, endorsed and monitored by the Board, ensures an independent, confidential, and robust review of company operations and provides a clear and transparent reporting channel from the independent auditors to the Board.*

Pending final outcome of an IPO, the sole shareholder in Saudi Aramco is the Government of the Kingdom of Saudi Arabia, holding 100% of the capital of the company. In terms of management, the Supreme Council of Saudi Aramco is constituted under the Chairmanship of the President of the Council of Ministers and has ten members appointed by Royal Order. The Supreme Council of Saudi Aramco is currently headed by Crown Prince Mohammed bin Salman, and the Council is responsible for determining the general policy of Saudi Aramco and is specifically responsible for the following, and meets once a year:

- *Approving Aramco's 5-year business plans, including its programs for crude oil production and the exploration and development of new hydrocarbon reserves*
 - *Approving Aramco's 5-year programs for future capital investment*
 - *Appointing the President of Saudi Aramco upon nomination by the Board of Directors*
 - *Appointing the auditors of Aramco and approving the company's accounts*
 - *Approving the Board of Directors Annual Report*
 - *Determining increases in Aramco's capital and the participation of any future shareholders*
 - *Determining the remuneration of the Chairman and members of the Board of Directors*
- (Saudi Aramco 2017e, Sukuk Issuance Program, p. 39)

The Minister of Energy, Industry, and Mineral Resources, Mr. Khaled Al Falih, former President and CEO of Saudi Aramco, chairs Aramco's Board of Directors. The Board of Directors are appointed by a Royal Order based on recommendation by the Minister of Energy, Industry, and Mineral Resources, and the Board has the authority to discharge Saudi Aramco's functions on a commercial basis as follows:

- *Establish by-laws for its own operations.*
- *Nominate a President of the company and other officers as deemed necessary and sets their duties and remuneration;*

- *Approve Aramco's internal, financial, administrative, technical, and personnel policies and regulations.*
- *Authorize company officers to sign on behalf of the company within limits set by the Board.*
- *Establish committees and assign them powers as deemed appropriate and set up the executive, compensation, and audit committee.*
- *Approve establishment of subsidiaries, branches, and offices of Saudi Aramco whether domestically or internationally.*
- *Authorize the company to take loans and grant security.*
- *Authorize the investment of the company's liquid assets.*
- *Review Saudi Aramco's business plans and approves its annual budget.*
(Saudi Aramco 2017e, Sukuk Issuance Program, p. 40)

The Board convenes at least two ordinary meetings annually at the company's headquarters or another location designated by the Chairman, with resolutions adopted by majority vote of members present and with the Chairman having a casting vote in the event of a tie. Besides holding board meetings, the company also holds executive committee meetings, and based on past meetings, they usually take place in the following months and relevant agendas:

Month/type	Agenda
<ul style="list-style-type: none"> • February/executive committee 	<ul style="list-style-type: none"> • Chairman does not attend, but other government appointed board members and independent board members attend • Reviews company accounts and approves capital items and allocation of cash
<ul style="list-style-type: none"> • April/board 	<ul style="list-style-type: none"> • Held internationally • Reviews the 5-year business plan
<ul style="list-style-type: none"> • July/executive committee 	<ul style="list-style-type: none"> • Held in a European city. Reviews capital expenditures
<ul style="list-style-type: none"> • October/executive committee 	<ul style="list-style-type: none"> • Held in Saudi Arabia. Selection of auditors. Prepares for November full board meeting
<ul style="list-style-type: none"> • November/board 	<ul style="list-style-type: none"> • Held in Saudi Arabia • Approves following year's budget and operating plan and personnel hiring plan

The executive committee comprises Saudi Aramco's President and CEO, along with the General Counsel and all the Senior Vice Presidents, as well as some other Board Members depending on the type of executive committee meeting as noted above. The Board of Directors currently includes senior government officials, the Head of a leading Saudi academic institution, and senior figures in the international oil, gas, and finance industry as well as Aramco's President and CEO; Aramco's Board of Directors as of October 2017 is set out in Table 5.4.

Table 5.4 Saudi Aramco Board of Directors, 2017

Name	Position	Background
<ul style="list-style-type: none"> • HE Khalid Al Falih 	<ul style="list-style-type: none"> • Chairman of the BOD • Govt. appointed 	<ul style="list-style-type: none"> • Minister of Energy, Industry, and Mineral Resources • Chairman of Aramco since 2015 and Director since 2017 • Former President and CEO of Saudi Aramco (2009–2015) and EVP of Operations Business Center, • Chairman of South Rub Al Khali JV between Shell, Total, and Aramco • Founding member of Board of Trustees of KAUST and Chairman of Dammam City Municipal Council, • B.Sc. Mechanical Engineering from Texas A&M and MBA from KFUPM
<ul style="list-style-type: none"> • Amin Al Nassir 	<ul style="list-style-type: none"> • President and CEO of Saudi Aramco • Company employee 	<ul style="list-style-type: none"> • Appointed to position in 2015 • Director of Aramco since 2010 • Former SVP Upstream (see bio in Executive Management)
<ul style="list-style-type: none"> • HE Dr. Ibrahim Al-Assaf 	<ul style="list-style-type: none"> • Director • Govt. appointed 	<ul style="list-style-type: none"> • Minister of State, Saudi Arabia • Former Minister of Finance • Director of Aramco since 1996 • Holds a B.A. in economics and political science, King Saud University, M.A. in economics from the University of Denver, and Ph.D. in economics from Colorado State University
<ul style="list-style-type: none"> • HE Yasir Al Rumayyan 	<ul style="list-style-type: none"> • Director • Govt. appointed 	<ul style="list-style-type: none"> • Managing Director and Secretary General of the Board of the Public Investment Fund • Director of Aramco since 2016 • Served as Board Member of the Saudi Stock Exchange (<i>Tadawul</i>) • Former CEO of Saudi Fransi Capital • Holds degree in accounting from King Faisal University, a CPA from the Saudi Organization for Certified Public Accountants, and completed the General Management Program at Harvard University
<ul style="list-style-type: none"> • HE Dr. Khaled Al Sultan 	<ul style="list-style-type: none"> • Director • Govt. appointed 	<ul style="list-style-type: none"> • Rector of King Fahd University of Petroleum and Minerals, since 2002 • Aramco Board Member since 2007 • Serves as Board Member of Trustees at KAUST • Former Deputy Ministers for Educational Affairs, Saudi Arabia • Hold Ph.D. in industrial and operations engineering and master's in applied mathematics from the University of Michigan, Ann Arbor, and an M.Sc. and B.Sc. from KFUPM

(continued)

Table 5.4 (continued)

Name	Position	Background
<ul style="list-style-type: none"> • HE Dr. Majid Al Moneef 	<ul style="list-style-type: none"> • Director • Govt. appointed 	<ul style="list-style-type: none"> • Director of Aramco since 2013 • Advisor to the Royal Court and former Secretary General of the Supreme Economic Council • Former Governor of OPEC for Saudi Arabia • Member of Oxford Energy Policy Club and Arab Energy Club and Professor of Economics at King Saud University • Former Vice President of the World Energy Council and Advisor to the Minister of Petroleum and Mineral Resources • Holds a Ph.D. in economics from the University of Oregon
<ul style="list-style-type: none"> • Sir Mark Moody-Stuart 	<ul style="list-style-type: none"> • Director • Independent 	<ul style="list-style-type: none"> • Director of Aramco since 2007 • Former Managing Director of Royal Dutch Shell and Director of Accenture PLC and independent non-Executive Director of HSBC Holdings PLC • Member of the Advisory Council for Global Compact of the UN Secretary General • Cochairman of the G8 Task Force on Renewable Energy • Holds a Doctorate in geology from Cambridge University and Honorary Doctorates from the Universities of Aberdeen, Robert Gordon, Royal Holloway, UK
<ul style="list-style-type: none"> • Peter Woicke 	<ul style="list-style-type: none"> • Director • Independent 	<ul style="list-style-type: none"> • Director of Aramco since 2007 • Former Managing Director of the World Bank Group from 1999 to 2005 and CEO and EVP of International Finance Corporation of the World Bank Group • Worked for nearly 30 years with JPMorgan serving as Chairman, MD, and CEO of JPMorgan Securities Asia and non-Executive Director of Anglo American PLC • Graduated from Saarland University, Germany, with B.A. in Business Studies and MBA
<ul style="list-style-type: none"> • Andrew Gould 	<ul style="list-style-type: none"> • Director • Independent 	<ul style="list-style-type: none"> • Director of Aramco since 2013 • Former non-Executive Chairman and non-Executive Director of BG Group PLC • Former CEO, Chairman, and Director of Schlumberger Oil Field Services • Former member of the International Advisory Board at KFUPM and Member of Board of Trustees at KAUST • Qualified as a Chartered Accountant at Ernst & Young and holds a bachelor's degree in economic history from Cardiff University

Source: Saudi Aramco (2017e). Sukuk Issuance Program, pp. 40–42

From the above table, it becomes apparent the dominant influence of the government's ownership of Saudi Aramco through a majority of government appointed Board of Directors. The three independent non-Executive Directors bring with them a wealth of experience in the energy as well as in the broader accounting and financial sectors which will be an asset for Saudi Aramco in pursuing its planned IPO listing, as these elements are critical for investor disclosure. As noted elsewhere, a commercialization and partial privatization of an NOC implies an adequately constituted Board of Directors who are capable of providing independent and objective oversight and direction. Possessing a profit-oriented restructuring with strong internal financial oversight and corporate planning functions and retention of cash flow are also key elements. The earlier listing of the mandate of the Supreme Council of Saudi Aramco, as well as the company's Board of Directors powers, results in a mixture of independent company powers, especially in approving Saudi Aramco's budget, obtaining loans and grants, and authorizing investment of Aramco's liquid assets. The Supreme Council still retains overall approval of the company's 5-year business plan for future capital investments, as well as its program for crude oil production and exploration and development of new hydrocarbon reserves. The latter are significant sovereign decisions concerning Aramco's overall long-term strategic operations, as there have been some concerns raised on how Aramco could successfully disentangle itself from government ties, especially financial ties, following an IPO (Scheck 2017; Hertog 2016). However, according to Saudi Aramco Chairman Khalid Al Falih, Aramco is "ring-fenced financially" from the state, with governance comparable to multinationals (Scheck 2017). How does Saudi Aramco governance compare with the partly privatized NOCs discussed in the preceding chapter? Table 5.5 sets out a comparative snapshot.

Table 5.5 Comparison of Saudi Aramco and partly privatized NOCs corporate and public sector governance

Indicator	Statoil	Petrobras	Rosneft	Sinopec	Aramco
(A) Corporate governance					
1. Ownership structure and govt. ownership	Yes. High	Yes. Low	Yes. High	Yes. High	<i>High</i>
2. Domestic/international listing	Yes. Oslo, NYSE	Yes, Brazil, NYSE	Yes, Moscow LSE	Yes, Shanghai, HKSE	<i>No</i>
3. Filing of Form 20F with US SEC	Yes	Yes	No	No	<i>N/A</i>
4. BOD and structure in place	Yes	Yes	Yes	Yes	<i>Yes</i>
5. Gender diversity/employee representatives	Yes	Nominal	No	No	<i>No</i>
6. Govt. BOD appointees	No	Yes	Yes	Yes	<i>Yes</i>
7. Independent BOD members	Yes	Yes	Yes	Yes	<i>Yes</i>

(continued)

Table 5.5 (continued)

Indicator	Statoil	Petrobras	Rosneft	Sinopec	Aramco
8. BOD has power, impact, and independent decision-making	Yes	No	Yes	No	<i>Yes</i>
9. Disclosure of audited data and other indications of disclosure and transparency	Yes	Yes	Yes	Yes	<i>No</i>
10. Chair of BOD appointed by state	No	Yes	Yes	Yes	<i>Yes</i>
11. Is budget process predictable, and separate from government?	Yes	No	No	No	<i>No</i>
(B) Public sector governance					
1. Presence of publicly articulated role of hydrocarbon sector with respect to national development objectives	Yes. Well-articulated	Yes. Key to national development	Yes	Yes. Important to state	<i>Yes</i>
2. Clear definition of the roles of policy, commercial operations and regulation, and assignment to specific entities avoiding conflict of interest	Yes	Mixed	Mixed	Mixed	<i>Mixed</i>
3. Presence of a strategy to transfer NOC noncommercial objectives to government or other agencies as capacity becomes available	No	No	Donations made to charities	N/A, low involvement	<i>N/A</i>
4. Transparent hydrocarbon sector revenue management including revenue distribution within country	Yes	Mixed	Mixed	No	<i>No</i>

Source: Adapted from the World Bank (2008). *A Citizen's Guide to National Oil Companies – Technical Report*

In comparison with the other four NOCs, Saudi Aramco compares well in terms of BOD power, impact, and independent decision-making but with mixed results elsewhere in terms of gender diversity, disclosure of audited data, as well as a budget process that is not separate from the government. Unlike some of the other NOCs that were assessed, Saudi Aramco does not disclose the roles of the different members of the Board of Directors and on which committee they serve, especially audit, or if any of the independent directors serve on it.

Saudi Aramco's internal audit and ethical compliance policies have been strengthened, with a dedicated auditor hotline setup to report fraud and business irregularities in line with international IOCs and similar to the Petrobras NOC hotline examined in the previous chapter. Aramco takes the issue of bribery, kickbacks, and improper gratuities very seriously, considering that the company is now involved in multi-development

projects and contract awards, and Saudi Aramco seems to have learned the lessons of previous bribery scandals, especially involving the US valves company Tyco in 2012 and one involving Embraer S.A., the Brazilian aerospace company in 2016 (Oil and Gas 2012; Saudi Aramco 2016d). Aramco admitted that business with Tyco over the last 12 years had amounted to \$42 million and that a former employee who had served as a technical specialist had accepted the bribe, while Saudi Aramco's internal investigations had established that a former company employee was involved in receiving a bribe in return for facilitating the purchase of three aircraft from Embraer (Aramco 2016c).

The proactive initiative by Aramco to investigate bribery was also partly in response to rare public criticism following the Tyco case, when some local media complained that "Aramco is a shielded fortress and nobody knows what is going on inside" (Hertog 2013, p. 3). A post-IPO Aramco will have to pay very close attention to external investor public relations and media management, and the company has appointed several international media experts in this respect, with US-based *FTI Consulting* appointed to support Aramco's communication team ahead of the sale, as well as the UK *Brunswick Group*, with FTI focusing on managing investor relations and Brunswick to run external and media communications (Bouso 2017; Shamseddine and Aswad 2017). The appointment of an experienced investor relation company like FTI is important as Aramco will have to manage the availability of critical financial and other data to outside investors. Aramco's internal transparency exists, but external transparency on key topics is sparse to date as exemplified by the limited financial information released in Aramco's debut \$10 billion *Sukuk* issuance (Saudi Aramco 2017e), and even at the national level, when Saudi Arabia raised a record \$17.5 billion international bond offering in 2016 (Kingdom of Saudi Arabia 2016). In a surprise move however, it was reported in October 2017 that Aramco had asked FTI to suspend its advisory role on the IPO (Argaam 2017n). This probably follows on from negative international media reports that the IPO had been cancelled or delayed and the seeming inability of Aramco's media advisors to counter repeated rumours with more pro-active company media releases on the actual progress of the IPO.

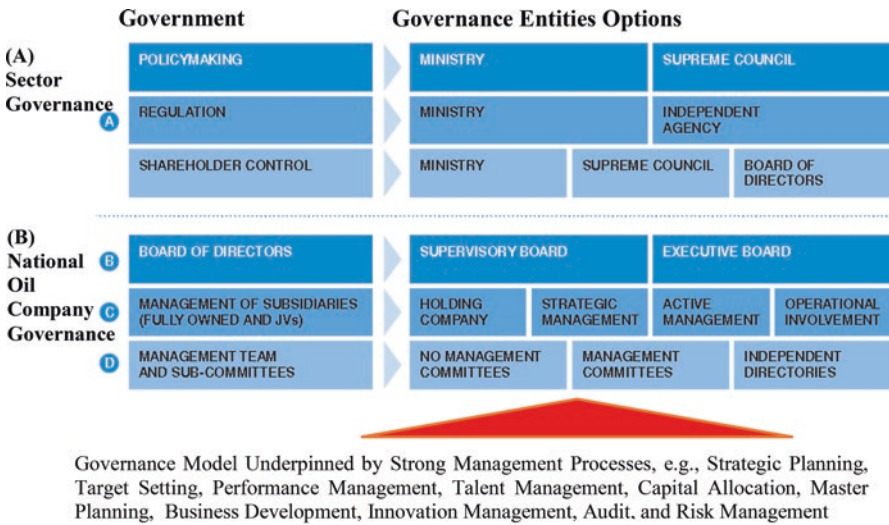
In trying to establish a corporate governance structure for Saudi Aramco, the following factors are normally taken into account for a "model" governance structure for an NOC:

- **Corporate governance:** this includes relevant objectives; autonomy; independent Board of Directors; clear human resource policies, based on merit; independent budget; auditing of results; financial oversight and corporate planning; and the ability to fund out of cash flow.
- **Public sector governance:** this includes relevant policy and clear roles; relevant objectives; independent functions of the NOC, Ministry, and regulator; requirements for noncommercial activity reporting and measurement; clear information on fiscal regime; and an independent hydrocarbon regulator.
- **Commercialization:** the existence of domestic and/or international partnerships, profit centers with audited financial reporting.
- **Resource endowment:** based on reserves (oil and natural gas).
- **Local contribution:** reporting on noncommercial activities, reported as fiscal contribution to the state budget.

(*World Bank* 2008, pp. 34, 35)

From the above, multiple options are possible for NOC governance entities, but key factors are for a separation of the roles required to effectively govern and manage the sector, as noted for Norway’s Statoil, where the General Assembly is the primary governing body. The separation of policy roles helps to balance strong state control over national resources while providing the necessary transparency, oversight, and security to attract private sector participation (Kombargi et al. 2011). Figure 5.3 sets out the various elements for a governance structure.

Fig. 5.3 Elements of a successful NOC governance framework



Source: Kombargi et al. (2011, p. 8)

In the above figure, the regulatory body can either be a Ministry or a dedicated agency that is empowered by the policymaking body – in this case the Supreme Council – to regulate and supervise the sector activity. The operating body is the NOC, and in Fig. 5.3 the NOC is focusing primarily on its operations and limits its involvement in the regulatory- and policy-related areas and management of subsidiaries, whether fully owned. JVs can be managed either through a holding company, strategic management, and active management or direct operational involvement. The key to successful governance *should be establishing a strong and independent Board of Directors to oversee the NOC’s management*, but regardless which approach is chosen, a separation between the roles of the Chairman of the Board and the Chief Executive Officer is important to maintain appropriate checks and balances between supervision and execution.

Figure 5.3 also sets out the varying degrees of management of NOC subsidiaries, ranging from a holding company to operational involvement. Each of these ensures a different level of delegation to appropriate management committees but with different underlying planning philosophies. Table 5.6 summarizes these elements.

Table 5.6 NOC corporate level governance

	Holding company	Strategic management	Active management	Operational involvement
• Underlying philosophy				
<i>Where value is created</i>	Value is created by individual companies, closest to customer	Value is created by individual companies, closest to customer	Value is created by individual companies using corporate expertise to help make key decisions	Value is created by corporate expertise and control
<i>Role of the corporation</i>	Create and enforce a disciplined management mode	Add value in the linkages between business units	Provide guidance to business units	Make key decisions for business units
• Key characteristics				
Performance expectations	Core sets high financial goals; business units are completely accountable for achieving results	Core sets financial, key operational, and value metrics; business units are accountable for achieving results	Core and business units share accountability for a broad set of financial and operating metrics	Core is accountable for financial and operating performance
Delegations	Large delegations	Large delegations with threshold based on risk to corporation	Moderate delegations based on risk to corporation and to individual business units	Limited delegations
Planning philosophy	Business units commit to multiyear strategic plans; as long as targets are met, no annual review necessary	Business units commit to multiyear strategic plans; core ensures strategy coherence across elements of linkage and reviews annual budgets against plan	Core proactively and critically reviews business unit strategic plans and annual budgets	Core dictates business unit strategic plans and budgets

Source: Vinay Couto, Per-Ola Karlsson, and Gary Neilson (1999) *Putting Headquarters in Its Place: A Lean, Global Corporate Core*, Booz & Company

While it is easier said that NOCs should be more involved in the management of their subsidiaries and overseeing their performance, yet this depends on the location of the subsidiary, whether it is in the same country or overseas in different time zones and operating in different cultural, linguistic, and regulatory settings. As noted

in earlier chapters, Saudi Aramco operates in many countries in Europe, the USA, China, and Japan and with new subsidiaries planned in Indonesia, Malaysia, and other countries. Under such circumstances, large delegation is essential but ensuring alignment on issues such as the subsidiaries' strategy direction, targets, and capital allocation. In addition, ensuring compliance through appropriate control and audit mechanisms is critical and may require an element of centralized audit and risk management processes, bearing in mind different country legal and regulatory policies in addition to those set by the mother company. In the final analysis, the balance between the role of management committees and the role of the subsidiary board will depend on the choice of the corporate core model as well as the type of the subsidiary being managed. The assessment of the various Saudi Aramco subsidiaries in the downstream sector in previous chapters has indicated that the company has struck a fine balance, with different levels of corporate governance applied to suit each subsidiary's circumstances.

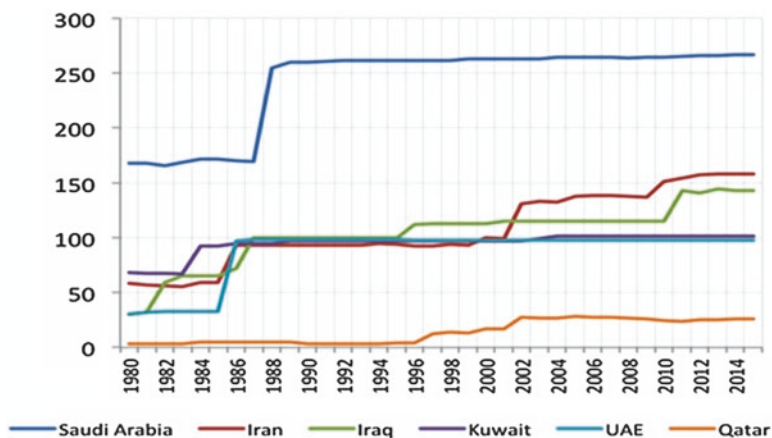
Reserves: Separating Fact from Fiction

The issue of Saudi Arabia oil reserves, specifically how much lies below ground and how long it will last before running out, has intrigued many researchers and is also an important question concerning the proposed Aramco IPO despite the fact that many analysts agree that the key to an IPO valuation is based on the expected cash flow and not on the size of the country's reserves (Kemp 2017a; Svenda 2017; Mearns 2016; Shamseddine et al. 2017b).

The Kingdom has stated that it has proven reserves of 266 billion barrels according to OPEC's Annual Statistical Bulletin (OPEC 2015, p. 12), and if these reserves are correct, it means that Saudi Arabia's reserves will last for another 70 years at an average production of around 10.2 million barrels per day. The seemingly unchanged Saudi reserve level has been the main factor for skepticism by commentators, given that the Saudi reserve estimates were abruptly raised without explanation from 170 billion barrels in 1987 to 260 billion in 1989 and have remained relatively constant every year since then at 260–265 billion barrels, even as the country has consumed domestically or exported another 94 billion barrels since 1989 (BP 2016). If the Saudi government's reserve figures are indeed correct, then this must have been managed either by replacing each produced barrel with new discoveries or increased the estimates of the amount recoverable from existing fields, but it has been pointed out that most of Saudi Arabia's giant oil fields, especially the "supergiants" like *Ghawar*, were discovered between 1936 and 1970, and no comparable discoveries have been made since then (Kemp 2017a). As such, any implied increase in Saudi reserves must therefore have come from enhanced estimates of the amount of oil recoverable from existing fields. The issue of abrupt jumps in oil reserves is not confined to Saudi Arabia as other countries like the UAE, Venezuela, Kuwait, Iraq, and Iran also raised their reserve figures, by a collective 77% or 304 billion barrels during the period 1988–1990 (Iran from 49 to 93 billion; Iraq from 47 to 100 billion;

Kuwait from 67 to 93 billion; UAE from 33 to 98 billion; and Venezuela from 25 to 56 billion). None of these countries have materially revised its estimates down since 1990 (Ramady and Mahdi 2015, p. 85). This is illustrated in Fig. 5.4 for Middle East oil producers.

Fig. 5.4 Middle East OPEC proved oil reserves (Billion barrels)

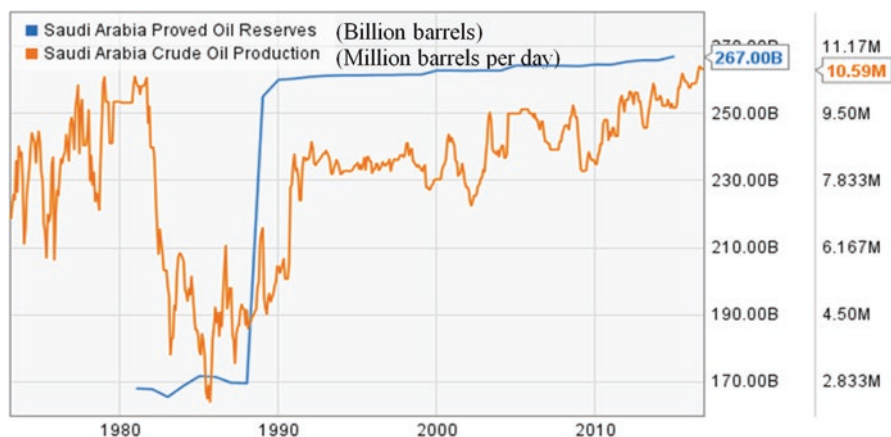


Source: Mearns, November 21, 2016

The problem in obtaining accurate reserve data is that field-by-field production profiles and reserve estimates are not available and are closely guarded state secrets, making it very difficult to accurately test or verify them field by field, and Saudi Arabia’s high production of oil has defied predictions that its output would peak and then fall (Simmons 2005).

Figure 5.5 illustrates the increased Saudi production levels since 1991–1992 against the relatively constant stated Saudi proved oil reserves.

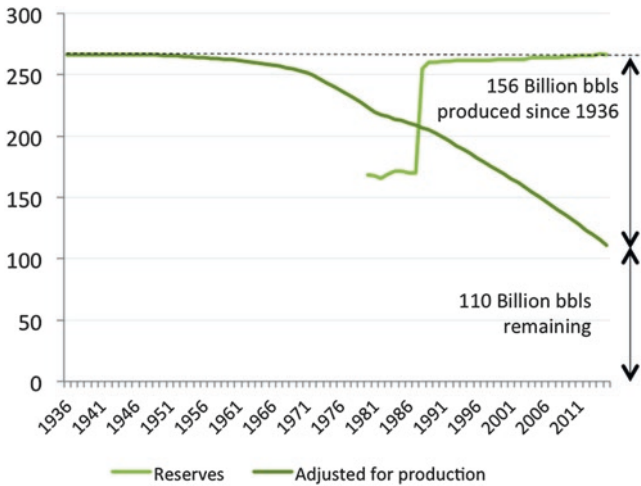
Fig. 5.5 Saudi Arabia’s proved oil reserves and crude oil production 1970–2017



Source: Svenda (2017)

From the above daily production amounts, some have estimated that the current level of available Saudi reserves are around one-third of the stated level of 266 billion barrels, as illustrated in Fig. 5.6.

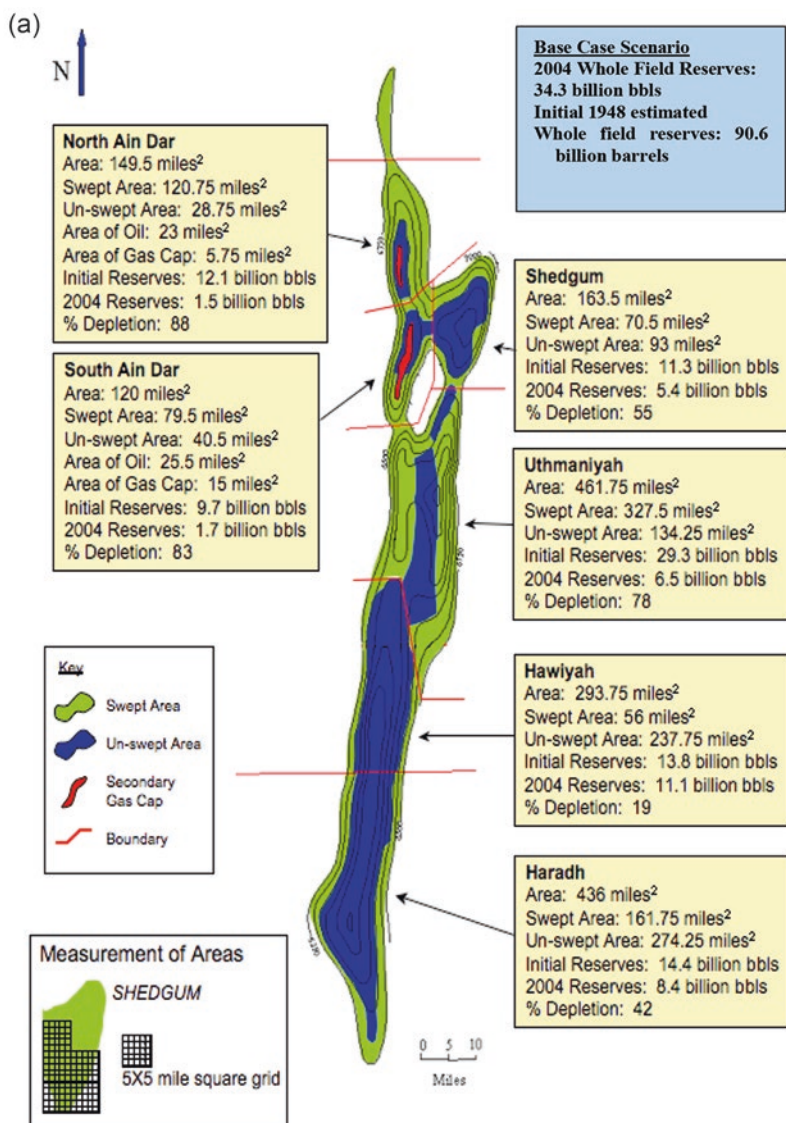
Fig. 5.6 Saudi Arabia’s estimated remaining proved oil reserves (Billion barrels)



Source: Mearns (2016)

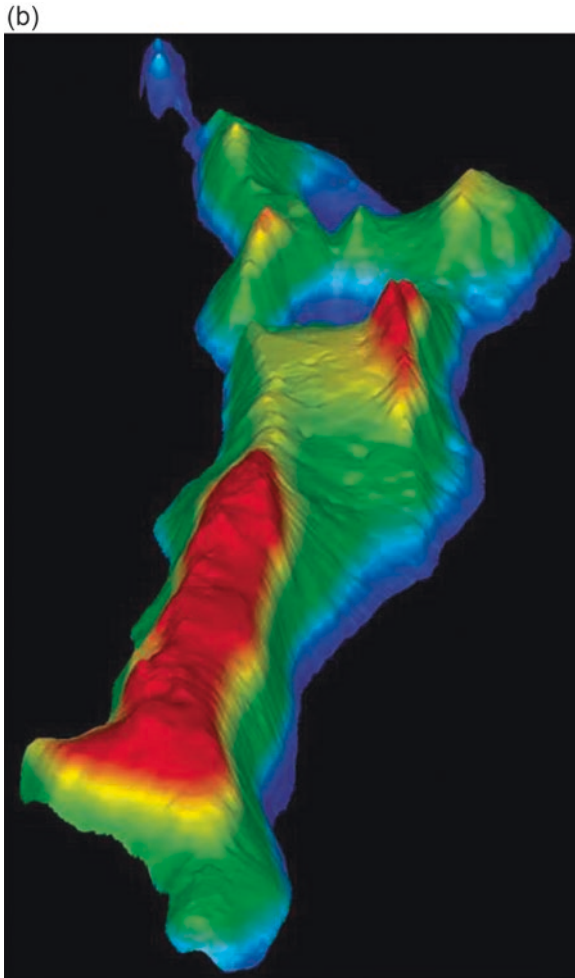
The above raises legitimate questions about the real level of Saudi reserves. As of now the Kingdom only provides general data about its reserves and not for individual oil fields or wells. Of particular interest has been the Saudi “supergiant” *Ghawar*, the largest oil field in the world, with 5 million barrels per day capacity and dwarfing the other global “supergiants” like *Kurkuk* in Iraq producing up to 1 million barrels per day, *Greater Burgan* in Kuwait with a production capacity of 1.7 million barrels per day, and Mexico’s *Cantarell*, the world’s largest offshore project with capacity of 1 million barrels per day (Ramady and Mahdi 2015, p. 84). However, with *Ghawar* producing around half of current Saudi daily production levels, there is increased focus on its production sustainability (Svenda 2017; Mearns 2007, 2016; Simmons 2005). Since its discovery in 1948, *Ghawar* has fascinated geologists and energy experts, given its truly unique and prodigious production capacity. The *Ghawar* field itself is made up of several fields as illustrated in Fig. 5.7a, b, with data for estimated remaining reserves for 2004.

Fig. 5.7 (a) Saudi Arabia’s supergiant *Ghawar* field: estimated initial and remaining reserves in billion barrels as of 2004. (b) *Ghawar*: A 3D model



Source: (a) Means (2007), The Oil Drum, Europe

Fig. 5.7 (continued)



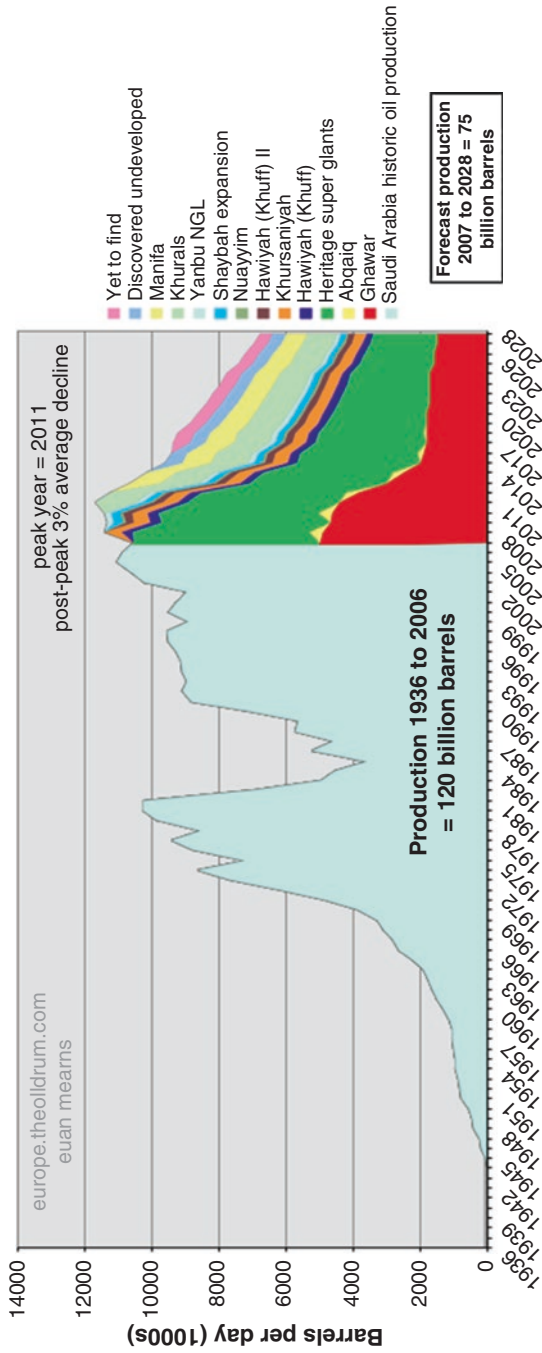
Source: (b) Saudi Aramco (2011b), Volume 2, p. 116

Figure 5.7b illustrates in striking 3D imaging *Ghawar*, the largest oil field in the world measuring about 280 km long and 26 km wide, lying 1648 meters to 2472 meters beneath the earth surface. The colors represent depths below sea level, from red at the highest level to yellow and green deeper below. The six fields that make up *Ghawar* include the larger fields of *Uthmaniyah*, *Hawiyah*, and *Haradh* with a combined estimated initial reserve of 57.5 billion barrels in 1948 and a 2004 reserve estimation of 26 billion barrels and a total estimated remaining 34.3 billion barrels for the *Ghawar* field as a whole. This represents around a 62% depletion rate by

Mearns in his 2007 analysis. In his 2016 assessment of Saudi reserves, Mearns estimates that the Kingdom has produced around 156 billion barrels to date, leaving 110 billion of reserves, based on the 267 billion barrels of stated reserves, as illustrated earlier in Fig. 5.6 (Mearns 2016, p. 1). According to several sources (Mearns 2016; The Oil Drum 2007), besides the “supergiant” *Ghawar* field, Saudi Arabia also possesses other “giants” comparable to the earlier mentioned Kuwaiti, Iraqi, and Venezuelan giants, namely, *Abqaiq* (17 billion barrels), *Shaybah* (14 billion barrels), *Berri* (11 billion barrels), *Manifa* (11 billion barrels), *Zuluf* (8 billion barrels), *Abu Sa’afa* (6 billion barrels), *Safiniya* (19 billion barrels), *Marjan* (8 billion barrels), *Qatif* (8 billion barrels), *Khurais* (8 billion barrels), and *Khursaniyah* (3 billion barrels).

Figure 5.8 forecasts that another 75 billion barrels of reserves would be drawn down by 2028, which, if added to the estimated 120 billion barrels, produced from 1936 to 2006, totals 195 billion barrels, *leaving 72 billion barrels of reserves by 2028.*

Fig. 5.8 Forecasted Saudi depletion by major fields 2007–2028 (barrels per day)



Source: Mearns (2016)

Is this forecasted Saudi reserve depletion realistic, and is there a counter argument to justify the continued high-level Saudi reserves over the years, whether through advances in extraction technology and better reservoir management, or is there confusion over different reserve methodology definitions being used by the interested parties?

When oil fields are first discovered, wells are dug, and under pressure at which the oil is confined, oil flow rates are achieved, but as remaining oil within the rocks begin to reduce, the rate at which oil is produced falls. In order to keep pressure up, Aramco and other producers begin to inject water into the rock, hoping to replace the oil being removed and thus keep up the pressure. Doing so creates a situation where the fluid coming out of the well is a mixture of water and oil. Aramco flows this fluid to a treatment plant called a gas oil separation plant (GOSP) that can separate the gas, water, and oil into separate flows. By this means, existing well production life is maintained, and reserves are replenished, but if the level of water flow increases, then there is diminishing oil production, and other methods are used. Some have pointed out that the so-called water-cut rates at *Ghawar* has been steadily rising from about 25% to over 36% in a short period of time from 1993 to 1999 (Nasser and Sabri 2004). An up-to-date method of maintaining well pressure is to inject carbon instead of either water or gas, and Saudi Aramco has been a leading pioneer in OPEC in applying carbon capture in its wells (Ramady and Mahdi 2015). It will be interesting to note whether, following its IPO, Aramco will pursue these and other production recovery methods even more aggressively as this was noted for the other partly privatized NOCs like Statoil, Rosneft, and even Petrobras all of whom raised their field recovery rates post privatization. Private shareholders were key in driving the companies to maximize value from company operations.

If no field-by-field historical production data is going to be revealed, then one is left with the methodology to be used by Aramco in its reserve estimations. The last time detailed field-by-field data was made available was nearly 40 years ago by the previous executives of the Arabian American Oil Company (Aramco) to the US Subcommittee on International Economic Policy, when Aramco was jointly owned by four US companies – Exxon, Texaco, SoCal, and Mobil (US Senate 1979). Since 1980, the Saudi government has been the sole owner of Aramco, and Saudi Arabia began reporting to OPEC “proved” reserves, which, according to some analysts, raised the question that Aramco had chosen to increase their reported reserves by reporting “probable” reserves as “proved” reserves (Kemp 2017a). This again raises questions on what type of definitions are being used to report “proven” reserves and whether they comply with internationally recognized standards, especially in a situation where there is no compunction to use such standards. The issue of reporting increased reserves is also affected by what constitutes “reserve growth,” making it possible for countries to produce more oil than initial reserve estimates suggested would be possible. Such reserve increases can come from the discovery of new oil deposits or from an increase in the estimated amount of oil that is commercially recoverable from an existing field, as well as coming from so-called field appreciation reserve growth. Conventional reserve estimations are reported as “possible,”

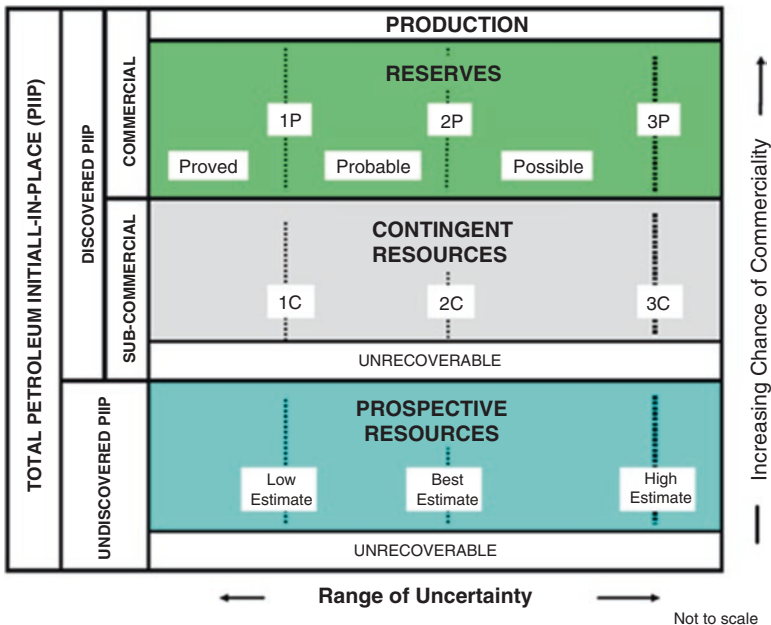
then “probable,” and eventually “proved” reserves, the last denoting a very high degree of certainty according to reserve reporting standards.

Even then, there are different reserve reporting standards that can be applied as noted in the preceding chapter, in assessing the four partly privatized NOCs, one being those used by the US Securities Exchange Commission (SEC and the other used by the Society of Petroleum Engineers (SPE). The SPE and the US Securities and Exchange Commission have strict definitions for estimating and reporting reserves, and there has been a large degree of convergence in their methodologies in the past decade, but there are still some differences in interpretations between “proven” and “proven and probable” reserves and the broader term of “resources.” In accounting terms, reaching year-end level of reserves are estimated as follows:

- *Reserves at beginning of the year*
- *Minus production during year*
- *+/- revisions*
- *+ additions (new discoveries/growth)*
- *= reserves at end of year*

According to the SPE’s Petroleum Resource Management System (PRMS), reserve estimation is set out in Fig. 5.9.

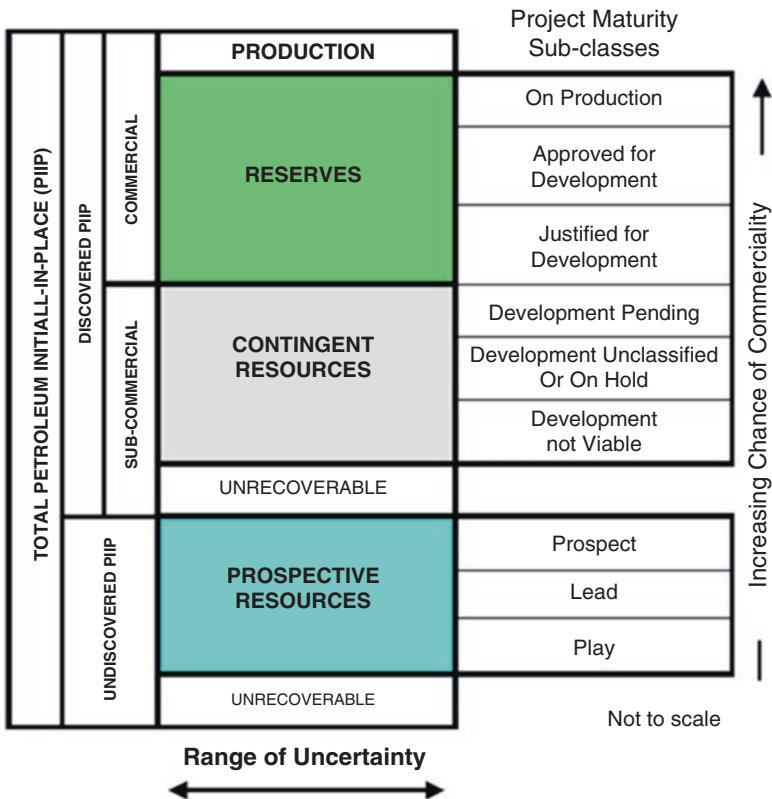
Fig. 5.9 SPE Resources classification framework



Source: World Petroleum Council (2008, p. 2)

In the above figure, the “range of uncertainty” reflects a range of estimated quantities potentially recoverable from an accumulation by a project, while the vertical axis represents the chance of “commerciality” that the project will be developed and reaches commercial producing status. “Contingent” resources are those quantities of reserve estimates to be potentially recoverable, but the applied projects are not yet considered mature enough for commercial developments. These include projects for which there are currently no viable markets or where commercial recovery is dependent on technology under development (World Petroleum Council 2008, p. 3). A key criteria for resource classification, whether it is under SPE or SEC regulations, is the determination of *commerciality*, and to be included in this reserve class, a project must be sufficiently defined to establish its commercial viability and a “reasonable” time frame for the initiation of the project, with 5 years recommended as a benchmark by the SEC, and a longer time frame by SPE to meet contractual or strategic objectives. As such, development projects may be subclassified according to the degree of project maturity as illustrated in Fig. 5.10.

Fig. 5.10 Reserve project maturity by subclasses



Source: World Petroleum Council (2008, p. 7)

Once again, project maturity reserve levels are classified into commercial, sub-commercial, and prospective resources.

If Aramco is considering a listing in the New York Stock Exchange, the definition for reserve accounting used by the SEC becomes important. The new SEC rules define *proved developed* oil and gas reserves as those that can be recovered through existing wells, with existing equipment and operating methods, or that can be recovered in other ways through extraction technology installed and operational at the time of the reserve estimate. For “undeveloped” oil and gas reserves, the SEC rules will permit companies to claim “proved reserves” beyond spacing areas *immediate adjacent to developed areas* if the company establishes with *reasonable certainty* that these reserves are producible economically (Mearns 2016).

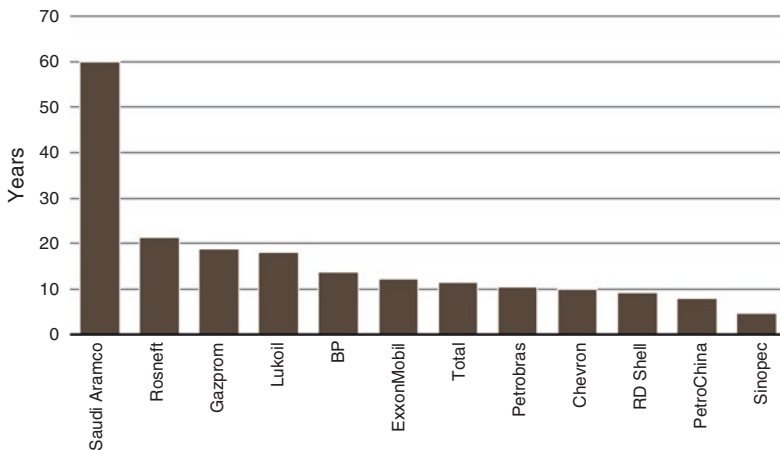
The SEC definition imposes a higher barrier and can affect even multinational energy companies listed in the New York Stock Exchange like ExxonMobil and Conoco Phillips who were obliged to slash their estimated “proved” 3.5 billion *Kearl* oil-sands project for ExxonMobil and 1.15 billion oil-sands reserves for Conoco Phillips. The combined 4.65 billion barrels of oil-sands crude removed from these two companies’ books were worth an estimated \$183 billion, and the revisions hit both US companies’ share price, as Exxon’s 19% cut to its global proved reserves amounted to the largest annual revision since the 1999 merger that created the company in its modern form, and the Conoco Phillips revision shrank its proved reserves by more than one-fifth (Carroll 2017). Under SEC rules applied for these two revisions, proved reserves *can only be included that can be produced economically within the next half-decade or 5 years*. Reserves then, or “proven” reserves, become a key metric watched by investors because they are indicators, along with oil prices, of future cash flows. A mere 3% reduction, taken in Exxon’s 2008 last reserve cut, lost the company more than 4% in a single day, wiping out almost \$17 billion in market value (Carroll 2017).

To prepare for its planned IPO, Saudi Aramco has appointed two international reserve Auditors, DeGolyer and MacNaughton, as well as Gaffney, Cline and Associates, part of Baker Hughes (Shamseddine et al. 2017b), and these Auditors have reportedly completed their audits in 2016, well ahead of the planned IPO in 2018, with the reserve audit figures “definitely not below” those published by Aramco, and others stating that the auditing firm’s estimates were higher than Aramco’s own (Argaam 2017d). DeGolyer and MacNaughton have been used by other NOCs that were partly privatized, noted in the preceding chapter, as firms listing in the New York are required by law to have a US SEC audit. The use of two reserve audit firms, rather than one like the assessed NOCs, is an effort by Aramco to bolster confidence that the process is not a “rubber-stamp” one. According to Aramco’s Chairman and Minister of Energy Khaled Al Falih, the Aramco listing is going to be the most transparent national oil company listing of all times and that “everything that Saudi Aramco has, that will be shared, that will be verified by independent third parties,” and this “would include financial statements, reserves... costs and profitability indicators” (Clark and Raval 2016). Saudi Aramco will disclose its 2017 annual statements prior to the listing scheduled for 2018, with the Minister adding that “the correlation between what the auditors have determined and what Aramco

has booked on its own books and announced in the past is very reassuring” (Nereim et al. 2017b). This type of information is likely to affect oil markets, because it will reveal, for the first time, how long one of the biggest crude producers can continue to pump, even if the SEC regulations specify a 5-year production time frame, and the quality and quantity of the promised Aramco information noted by the Minister is crucial for investors considering a stake in the company, as an independent reserve audit total that is significantly above or below the stated 261 billion figure is likely to affect Aramco’s potential value. Some have doubted whether Saudi Aramco will indeed disclose field-by-field reserves, given that historically the company considers reserve decline rates and field maturity as sensitive nonpublic data, and what Aramco might do initially is to give a corporate summary and break it down by crude grade with more data to follow. Given the complexity of the larger fields like *Ghawar*, the best that an external reserve auditor can do is to audit the quality of the data and the process by which Aramco calculates its data, according to Dr. Sadad Al Husseini, a former Aramco Executive Vice President (Nereim et al. 2017b).

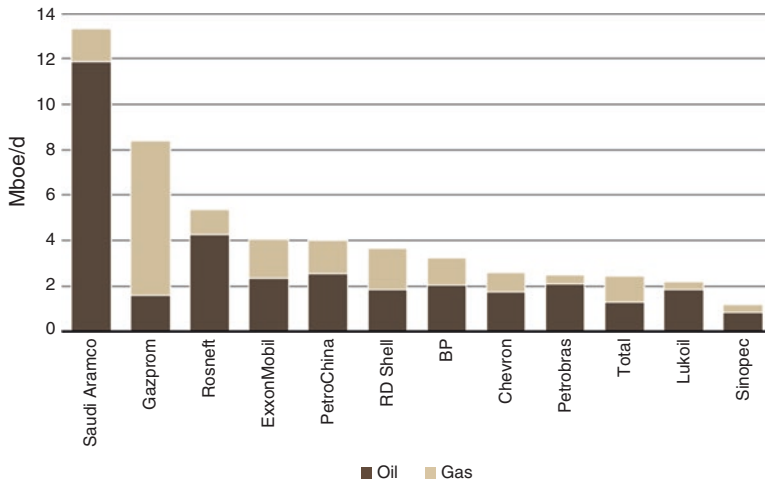
Whatever is finally released on reserves data, it is a fact that based on the reserve estimates given by Saudi Aramco, the company dwarfs all other NOCs including Rosneft, Petrobras, and Sinopec as well as IOC’s in terms of reserve life estimates and production of oil, illustrated in Figs. 5.11 and 5.12.

Fig. 5.11 Saudi Aramco reserve life vs. selected NOCs and IOCs



Source: UBS, Global Research, 9 July 2017, p. 2

Fig. 5.12 Saudi Aramco’s production vs. selected NOCs and IOCs (Mboe/d)



Source: UBS, Global Research, 9 July 2017, p. 2

Where to List?

One of the key questions faced by Saudi Aramco is where to list the company and whether a single market can absorb an IPO the size of the Aramco offering. According to Aramco Chairman Khaled Al Falih, the intentions is there to be several markets, “at least two, likely three” in which shares are presented, with the base listing in Riyadh, without identifying the other potential sites (Nereim et al. 2017b). However, media reported that Aramco was planning to list shares in London, New York, Hong Kong, Tokyo, Toronto, and Singapore as possible listing centers (Sheldrick and Tsukimori 2017; Shamseddine et al. 2017a; Nereim et al. 2017b), with Aramco also considering cross-listing its shares in several equity markets simultaneously and that “all options are open,” according to Minister Falih (Argaam 2017g).

Given global interest in the planned Aramco IPO, and the prestige that such a listing would bestow upon the winning stock market, it was no surprise that there was some intensive lobbying made by interested governments. The Chinese government has expressed strong interest and reportedly is creating a consortium, including state-owned oil companies and banks, and its sovereign wealth fund to act as a cornerstone investor in the IPO by promoting Hong Kong as a listing venue (Zhu et al. 2017). According to these reports, Chinese companies are interested in investing in the Aramco IPO to secure long-term crude oil supplies and that among those Chinese companies that were interested were the China Investment Corporation, the country’s sovereign wealth fund with \$800 billion assets, Sinopec, and Petro China, as well as the Industrial and Commercial Bank of China International Holdings, and China International Capital Corporation, but that the final decision would be made

by the Chinese State Council (Zhu et al. 2017). The Chief Executive of Hong Kong Exchanges and Clearing, Mr. Charles Li, promoted Hong Kong as a gateway to access China's rich investor capital base and investment wealth onshore in China, and the Hong Kong Exchange was "working very hard" to obtain the deal (Argaam 2017e). As a further sign that Saudi Aramco was also taking Chinese interest in the IPO seriously, the company's Board of Directors met in China in May 2017, for the first time in 7 years. This follows on after King Salman's visit to Beijing in March 2017, where the prospect of Chinese interest in the Aramco IPO was discussed with the Chinese leadership (Shamseddine et al. 2017a).

Not to be left behind, the Singapore authorities also made a pitch to have Aramco listed on the local exchange, with reported incentives being offered to lure Saudi Arabia, including inviting one of its state investment companies to become a cornerstone investor in the Aramco IPO as well as potential Singapore cooperation with the Saudi government on future investments, as well as promoting Singapore as the biggest oil trading center in Asia (Argaam 2017f). The London Stock Exchange (LSE) apparently has also been making a strong effort to list Saudi Aramco in London and is working on a "new" type of listing structure that would make it more attractive for Aramco to join the exchange, following the LSE's Chief Executive Xavier Rolet's visit to Saudi Arabia along with the UK's Prime Minister Theresa May in April 2017, where the Prime Minister offered full support (Afanasieva and Price 2017). According to reports, the "new" type of listing would be a model that would allow Aramco to avoid the most onerous corporate governance requirements of a "primary" listing, without it being seen as second class, but which would leave the LSE open to criticism as noted further below, on the grounds that the LSE is changing the rules in order to attract large state-backed companies which are reluctant to meet more stringent corporate governance requirements. As will be discussed in more detail, listing on the LSE is either through the more prestigious "premium" or the less onerous "standard" listing, especially in relation to the issue of controlling shareholders. The UK's Listing Authority, which is part of the Financial Conduct Authority (FCA), is apparently discussing a new category of listings for large international companies which may fail to meet the premium listing requirement standards but is more prestigious than the "standard" category and which allows a government to retain control rights that are incompatible with a conventional premium listing. According to reports, both the LSE and the UK government were "putting pressure on the FCA to help them come up with a workable structure" to clinch the Aramco IPO deal, but bearing in mind this could have wider consequences. In the 2000s, the LSE sought to attract new money from overseas companies, and the UK listing authority waived the usual governance requirements for five new overseas companies, allowing them to list less than 25% of their shares, but rules were tightened again in 2013 after scandals at two high-profile emerging market companies (Afanasieva and Price 2017). London was forced to tighten its listing rules following corporate governance debacles at foreign controlled groups such as the Kazakh miner group *Eurasian Natural Reserves Corp.* (Lex 2017). The loss of Prime Minister May's parliamentary majority, following her political gamble to call a UK snap general election in June 2017, has weakened her hand to put political

pressure on the LSE to offer meaningful changes to LSE listing rules to accommodate Saudi Aramco's premier type listing, but as noted below, this seemed to have eased, and the London Exchange is once again in contention.

Another bourse in Asia is considering Aramco's IPO listing, and following King Salman's Asia visit in March 2017, Aramco and the Tokyo Stock Exchange (TSE) set up a joint group to study mechanisms for such a listing. However, according to media reports, while the Japanese government is keen to have Aramco shares traded in Tokyo, bankers and lawyers say that the Tokyo market is unlikely to get the prize listing due to other Asian bourse competition and also the fact that Japanese investors are less receptive to energy companies than technology sectors (Sheldrick and Tsukimori 2017).

Despite positive official endorsements to attract Saudi Aramco to their listing centers, there have also been some disquiet and reservations expressed, including outright opposition to granting Saudi Aramco any special privileges to ensure a listing takes place. The push-back has come from investors and those listed on the London Stock Exchange, with reports that some leading British fund managers, who would be among potential investors, have expressed reservations about Aramco's governance and valuation (Jessop 2017). The reservations centered around how much independently verified data is available about Aramco's oil reserves, its board structure post IPO, and the small portion of the company planned for listing, around 5%. In the UK, governance is an important issue for asset managers, as investors like pension funds and insurance companies are increasingly pushing asset managers to hold companies to account more and prevent or minimize bad decision-making. Such issues ensure that any Aramco LSE listing will face a "long slog" (Warner 2017), with calls not to bend the IPO rules for Saudi Aramco (Lex 2017). These objections crystallized in a letter to the UK Financial Conduct Authority by Chris Cummings, Chief Executive of the Investment Association, which clearly stated that they would not tolerate any listing that did not adhere to the LSE's market rules and standards and specifically not to make an exception to the rules that force companies to list at least 25% of their shares to qualify for inclusion in the FTSE indices (Donnellan 2007). The Investment Association's Chief Executive feared that if Saudi Aramco were permitted into the FTSE 100 index, tracker funds would be forced to buy its shares on a passive basis and that the index would become hostage to the oil price and geopolitical tensions in the Middle East. Mr. Cummings stated in his letter that investors believed 25% should be "the minimum free float level for any premium listed company in the UK irrespective of the size of the company" and "that this should be preserved at all cost to protect the integrity and standard of the UK premium listing" (Donnellan 2007). As some have argued, the point of listing rules is to attract as many companies as possible while ensuring they are trustworthy, and the duty of the regulator is to ensure they are comparable and to place similar obligations on all issuers, and "that is how the market must work in order to flourish" (Gapper 2017).

Can the rules of the LSE be changed? According to the *FTSE Russell*, the stock exchange company that compiles the indices, "indexes need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality" and FTSE Russell is already consulting on such changes in the light of recent US IPOs –

Snapchat in particular – involving nonvoting shares, but as critics point out, parties to the index are being asked whether it is appropriate to include companies where investors have no say in management and governance whatsoever, as they do not with *Snapchat* (Warner 2017). Index matching strategies, however, more or less oblige fund managers to invest in *all* companies in the indices regardless whether they like individual companies or not, although some have estimated that a final Aramco IPO valuation would add around 2% to the FTSE 100 index (Lex 2017).

However, while the issues raised by those objecting to London LSE obstacles might be overcome by Aramco deciding on a “standard” listing, lawyers have expressed major concerns of potential litigation risks relating to a New York Stock Exchange listing (Raval et al. 2017b). According to White & Case, Saudi Aramco’s legal firm on the float, a New York listing, poses the greatest litigation risk of any jurisdiction. This, if true, would place Saudi Aramco’s assets from any IPO, including its wholly owned, US refinery Motiva, vulnerable to legal action arising from a successful litigation by families of the victims of the 9/11 terror attacks to sue Saudi Arabia under the *JASTA* legislation (Raval et al. 2017b). In addition Saudi Aramco could face class-action litigation should it not comply with strict rules from US regulators on reserves and data disclosure for oil companies, as noted earlier with the action taken by the SEC against ExxonMobil and Conoco Phillips.

Given the potential listing venues open for Saudi Aramco, the section below compares various listing regulations and the requirements of the various bourses to enable clarity on where to list. Irrespective which listing location is finally chosen by Saudi Aramco, well-regulated exchanges will assess potential IPO applications that meet clear criteria, with some exchanges emphasizing certain elements over others. These are:

- *Type of industry (commodity, high tech, etc.)*
- *Maturity profile of the IPO firm*
- *Quality and depth of financial underwriting*
- *Strength of home country legal structure and investor protection*
- *Board independence*
- *Available free float*

IPO studies have looked at a linkage between stock market performance with the governance characteristics of an IPO firm, and whether similarities between a foreign IPO’s home and host market’s regulatory institutional framework reduces investor uncertainties and their need to rely on the foreign firm’s compliance with multiple governance mechanism, thus providing “legitimacy” of foreign firm level governance mechanisms (Filatotchev and Aguilera 2014, p. 303). Key among this is the extent to which the foreign country’s regulatory institutions protect minority investor rights. The more similar a foreign IPO’s home and host markets’ regulatory environment, the more this tends to reduce investor uncertainties. When a foreign firm has reached a certain level of “higher”-order internal and external regulatory legitimacy, this may help it achieve equivalent levels of perceived IPO stock market evaluation and ensures that the foreign IPO obtains a premium pricing on listing, compared to a discount on companies that are neither regulatory nor governance

compatible. This is important for confidence building, as investors in more developed financial markets may suspect that, for example, insiders or majority controlling shareholders may be diverting resources from the prospective IPO firm to the detriment of minority shareholders (La Porta et al. 2008, p. 310).

Our comparison of the global stock exchanges will focus on *Hong Kong, New York, Singapore, London, and Tokyo*, as these are the stock exchanges that are in the running for a possible Saudi Aramco IPO listing according to the company's various statements. The primary sources of information for the comparative analysis will be from the official websites of the above bourses (www.londonstockexchange.com; www.nyse.com; Hong Kong Stock Exchange, <http://www.hkex.com.hk>; www.sgx.com; [Tse.or.jp](http://www.tse.or.jp); [kkex.com](http://www.kkex.com)) as well as Ernst & Young's publication on IPO insights (Ernst and Young 2009), PWC's guide to listing in the USA (PWC 2012), as well as the London Stock Exchanges guide to listing on the LSE (London Stock Exchange 2010). The results are summarized in the tables that follow.

Table 5.7 Comparative stock exchanges: London, New York, Hong Kong, Singapore, Tokyo (2007)

Key indicators	London	New York	Singapore	Hong Kong	Tokyo
1. Number of listed companies	3081	2122	688	979	2381
2. Aggregate market capitalization (\$ Bn) 2007	8458	23,963	420.2	1729	4786
3. IPOs listed: 2002–2006	127	232	217	236	105
4. Amount raised 2002–2006 (\$ Bn)	63.4	108.8	7.6	78.9	30.0
5. Share of global IPOs: 2002–2006 (%)	2.0%	3.7%	3.4%	3.7%	1.7%
6. Share of global IPO proceeds: 2002–2006	10.4%	17.5%	1.2%	12.9%	4.9%
7. Top listed company: 2006 (\$ Bn)	<i>Royal Dutch Shell</i> 231 bn	<i>Exxon Mobil</i> 612.4 bn	<i>Singapore Telecom</i> 34.1 bn	<i>HSBC</i> 211.1 bn	<i>Toyota</i> 237,0.0 bn

Source: Ernst and Young (2009, pp. 10–18)

During the period 2002–2006, the total number of IPOs listed globally, including those in the alternative investment market and Euronext, totaled 6399, with the five bourses in Table 5.7 accounting for 12.2% of global IPOs, but raised \$286.7 billion out of a global \$657 billion or 43.5%. This represented around 47% of total global proceeds. Table 5.7 indicates that London, New York, and Tokyo accounted for the majority of listed companies, with London taking first place, but that New York dominated the other exchanges in terms of market capitalization, followed by London and Tokyo. Hong Kong and Singapore did well in terms of the number of IPOs listed during the period 2002–2006, with Hong Kong surpassing New York, and also coming second to New York in terms of the aggregate amount raised by these IPOs. Singapore came last in all key indicators, except in terms of the number

of IPOs listed, where Singapore came third, surpassing London. The top listed company was in the New York Stock Exchange, *Exxon Mobil* at \$612 billion, followed by *Toyota* and *Royal Dutch Shell* in Tokyo and London, respectively. However, it is important to assess the relative *sector focus* of these exchanges, especially in the *energy and power sector*. Table 5.8a and 5.8b assesses this in more detail.

Table 5.8a Stock exchanges top three and energy sectors listed companies (2007): London, New York, Singapore, Hong Kong, and Tokyo

Sector	London	Hong Kong	Singapore	New York	Tokyo
1. Sector:	Financials	Financials	Financials	Financials	Industrial
• No. of listed companies	657	129	50	312	616
• % Listing	45.3%	13.2%	7.3%	14.7%	25.9%
• Market cap. (\$ Bn)	2261	708	101.3	5568	1438
• % Market cap.	27.3%	41.0%	24.1%	23.2%	30.0%
2. Sector:	Consumer products	Telecoms	Industrials	Telecoms	High technology
• No. of listed companies	195	34	161	89	299
• % Listing	13.5%	3.5%	23.4%	4.2%	12.6%
• Market cap. (\$ Bn)	848	263	86.4	2289	646.5
• % Market cap.	10.3%	15.2%	20.6%	9.6%	13.5%
3. Sector:	Industries	Real estate	Real estate	Healthcare	Materials
• No. of listed companies	128	93	29	123	325
• % Listing	8.8%	9.5%	4.2%	5.8%	13.6%
• Market cap. (\$ Bn)	1157	180.5	52.8	2294	687
• % Market cap.	14.0%	10.4%	12.6%	9.6%	14.4%
4. Energy and power	√	√	√	√	√
• No. of listed companies	60	36	28	303	90
• % Listing	4.1%	3.7%	4.1%	14.3%	3.8%
• Market cap. (\$ Bn)	1261	147.5	6.5	4181	114
• % Market cap.	15.3%	8.5%	1.5%	17.4%	2.4%

Source: Ernst and Young (2009), IPO Insights

Table 5.8b Energy and power IPOs 2002–2006: London, New York, Hong Kong, Singapore, and Tokyo in relation to global IPOs

Exchange	No. of IPOs	% of sector IPOs	Proceeds (\$ Bn)	% of sector Proceeds	Average proceeds (\$ million)
New York	39	8.1%	11.2	11.6%	286.3
Singapore	17	3.5%	0.5	0.6%	32.2
London	13	2.7%	17.0	17.6%	1308
Hong Kong	10	2.1%	2.3	2.4%	228
Tokyo	7	1.4%	6.4	6.6%	912
<i>Rest of the world</i>	397	82.2%	59.3	61.2%	273
Total	483	100%	96.7	100%	200.0

Source: Ernst and Young (2009), IPO Insights, p. 34

Table 5.8a indicates that the financial sector is a major one for London, Hong Kong, Singapore, and New York, but the industrial sector takes top place in Tokyo, with telecoms and high technology also important sectors for many. However, in the energy and power sector, both London and New York stood out in terms of the number of listed companies as well as their market capitalization compared to Hong Kong, Tokyo, and Singapore, partly explaining Saudi Aramco's desire to list in London or New York, given the expertise of these two exchanges in the energy and power sector.

Table 5.8b examines more closely the energy sector's IPOs in the five exchanges. This confirms New York and London's premier standing for raising the largest amounts for energy and power IPOs, representing around 29% of global proceeds. Overall, the five bourses while accounting for around 17% of global energy and power IPOs raised nearly 39% of global proceeds during the period 2002–2006. Tokyo stood out from among the Asian exchanges, raising \$6.4 billion, yet this could be due from power company listings, rather than energy companies. However, while both London and New York seem to be front runners in terms of preferred listing for energy companies, it is also important to assess the regulatory listing requirements of the five exchanges.

Table 5.9 Main listing requirements: London, New York, Hong Kong, Singapore, and Tokyo

Exchange	Listing requirements
London	<ul style="list-style-type: none"> • Income requirement: 75% of applicant's business must be supported by a 3-year earnings records • At least \$1.4 million market capitalization • 3-year operating history • Sufficient working capital for at least next 12 months • At least 25% of shares must be held by the public (prime listing) • A 12-month lockup period may be required in certain circumstances if there is a meaningful sell-down • Listing timeline: 12–24 months before admission • Regulated by the Financial Services Authority (FSA) • Role of Chairman and CEO not exercised by same individual. At least two independent non-Executive Directors, with audit committee all independent non-Executive Directors • Corporate governance statement describing main features of company's internal control and risk management system in relation to their financial reporting processes required as part of company's corporate governance disclosures • Transparency directive responsibility statement, misstatements in a prospectus falls on issuer and each of the Directors
New York	<ul style="list-style-type: none"> • Adjusted pretax income: aggregate for last 3 years, \$100 million • Valuation with cash flow minimum \$500 million on pure valuation (6 month average or at IPO) minimum \$750 million, operating history 3 years • Working capital: N/A • Total international shareholders: 400 • Foreign issuers required to comply with the requirements of the Sarbanes – Oxley Act of 2002 • Obligated to use US GAAP or home GAAP reconciled to US GAAP for 2 years • To provide an audited balance sheet as end of the latest 2 years and audited statements of income and cash flows for the latest 3 years in annual periodic filings done under form 20-F • Must disclose any significant ways in which corporate governance policies differ from those followed by domestic companies • Exchange lockup requirements: none, but customary for underwriters to require 18-day lockup period • Listing timeline: 12–24 months • Governing body Securities and Exchange Commission (SEC) • Majority of the members of the Board of Directors must be independent • All audit committee, at least 3, must be independent • Sarbanes – Oxley requires the CEO and principal financial officer to certify that each annual and quarterly report filed with the SEC fully complies with the requirements of the SEC

(continued)

Table 5.9 (continued)

Exchange	Listing requirements
Hong Kong	<ul style="list-style-type: none"> • Profit test \$3.8 million in two preceding years, market cap/revenue/cash flow test: \$64 million for most recent audited year • Operating history: at least 3 financial years • Working capital/assets: N/A • Minimum 300 shareholders, not more than 50% of securities in public hands can be owned by the three largest shareholders • A summary of the foreign issuers constitutive documents and relevant regulatory provisions of the jurisdiction in which it is incorporated or otherwise established • Exchange lockup requirements: the controlling shareholder are prohibited from reducing any interests within the first 6 months after listing • Listing timeline: 12–18 months • Main regulator: The Securities and Futures Commission (SFC) • Recommends the disclosure of directors' review of the issuing company's system of internal control and any significant views or proposals put forward by the audit committee • Board composition: at least one-third independent and audit committee composed of non-Executive Directors only • Directors have a legal obligation to prepare statements of accounts that give a true and fair view of the company's financial position, and failure to do so is a criminal offense, and the Board of Directors has collective responsibility for the company's account
Singapore	<ul style="list-style-type: none"> • Cumulative pretax profit of at least \$4.9 million over the last 3 consecutive years • Capitalization: minimum \$52 million based on issue policy • Three years of operating history, 3 years continuity of management • Working capital/assets: group must be in a healthy financial position with regard to positive cash flow from operating activities • 25% of issued shares held by at least 1000 shareholders • At least 2 independent directors are required, one of whom must be resident in Singapore, at least one-third independent board with audit committee all non-Executive and majority of independent Directors • Singapore, US, or international accounting standards are acceptable on the exchange • Lockup requirements: usually 6 months • IPO process timeline: 6–12 months • Main regulator: Singapore Exchange Commission • Requires all listed companies to disclose their corporate governance practices in their annual reports and explains areas of deviation from the code Singapore Exchange listing manual • Companies Act makes it an offense for any person to willfully make or authorize the making of false or misleading statement

(continued)

Table 5.9 (continued)

Exchange	Listing requirements
Tokyo	<ul style="list-style-type: none"> • Pretax profit for last 3 years \$5.2 million • Market capitalization: minimum \$414 million • Operating history: at least 3 years • Audited accounts 3 years • Working capital: minimum \$810 million net assets • Minimum 2200 shareholders • A foreign company wishing to list must furnish a documents showing that the decision for a listing application has been made by the Board of Directors, a statement of legal opinion and foreign companies must appoint an attorney-in-fact residing in the Tokyo area who will fulfill continuous disclosure requirements • Exchange lockup requirement: none • IPO process timeline: 24 months • TSE regulator • Board composition not specified but audit committee majority independent • Mandatory management assessment – internal control report and auditor’s audit of management assessment

Source: Ernst and Young (2009), IPO Insights

Table 5.9 has indicated that, while there is some commonality between the five exchanges in some listing requirements, especially in corporate governance and the role of independent directors, there are also some differences concerning minimum IPO listing capitalization, accounting requirements, and required minimum share floatation, with London specifying the highest percentage – 25% – required for a public IPO listing, especially for a “premium” listing, although a “standard” listing is also required to have a 25% free share float. Table 5.10 sets out the major differences between these two types of share listing on the London Stock Exchange, given that London is an important listing center for energy companies as noted earlier.

Table 5.10 A comparison between premium and standard listing requirements on the London Stock Exchange (*Pre-new 2017 proposed prime listing rule changes*)

Eligibility criteria	Premium equity shares	Standard shares
• Free float	25%	25%
• Audited historical financial information	3 years	3 years or such shorter period
• 75% of applicant’s business supported by revenue earnings record for the 3-year period	Required	N/A
• Control over majority of the assets for the 3-year period	Required	N/A
• Requirement for clear working capital statement	Required	N/A

(continued)

Table 5.10 (continued)

Eligibility criteria	Premium equity shares	Standard shares
• UK corporate governance code	Comply	N/A
• Model code	Applies	N/A
• EU – IFRS or equivalent	Required	Required
• Interim management statements/half yearly financial reports	Required	Required
• Related party transactions	Rules apply	N/A
• Cancellation	75% shareholder approval required	No shareholder approval required

Source: London Stock Exchange (2010). A guide to listing on the London Stock Exchange, p. 18

Further to the eligibility requirements set out in Table 5.10, a “standard” listing requires compliance with European Union (EU) minimum standards only, while a “premium” listing also requires compliance with the more stringent super-equivalent standards, with only equity shares being admitted to a premium listing, and issuers of other securities may only seek a standard listing for their securities. According to the London Stock Exchange, an investment entity will only be able to benefit from a “standard shares” listing category for a further class of equity shares only if it already has, and for as long as it maintains, a premium listing of a class of its equity shares. As such, Saudi Aramco can only issue non-equity shares in a standard listing if it follows this route. How does Saudi Aramco comply with some of the key requirements of the five exchanges to assess the degree of current compliance for a possible IPO? Table 5.11 examines this further.

Table 5.11 Saudi Aramco conformity to key listing requirements of selected stock markets: London, New York, Hong Kong, Singapore, and Tokyo

Listing requirements	Saudi Aramco	London	New York	Hong Kong	Singapore	Tokyo
• <i>Collective board responsibility for company account</i>	NO ^a	Yes	CEO and CFO	Yes	Offense to make false statement	Resident authority in-fact
• <i>Fully independent board/majority independent</i>	NO	2 Indep. members minimum (non-exec)	Majority indep.	One-third indep.	Min. 2 indep. directors, 1 resident in Singapore	Not specified
• <i>Audit committee independent members</i>	No	All non-exec. indep.	All indep.	All indep. Non-exec.	All indep.	Majority indep.
• <i>Audited accounts and years</i>	N/A ^a	Yes 3 years	Yes 2 years	Yes 3 years	Yes 3 years	Yes 3 years
• <i>US GAAP/IFRS standards</i>	N/A ^a	IFRS	US GAAP	IFRS	US or Int. Acct. Standards	Int. Acct. Standards
• <i>Company operational maturity profile (Years)</i>	More than 3 years	3 years	3 years	3 years	3 years and 3 years management continuity	3 years
• <i>Corporate governance rules</i>	Yes	Yes	Yes	Yes	Yes	Yes
• <i>Minimum listing requirement</i>	5% stated	25%	400 shareholder	No more than 50% held by 3 largest holder	25% of shares held by 1000 shareholders	Min. 2200 shareholders
• <i>Home country regulatory oversight</i>	N/A	N/A	N/A	N/A	N/A	N/A
• <i>Listing timetable</i>	12–18 months	12–24 months	12–24 months	12–18 months	6–12 months	24 months

Source: Author's evaluation

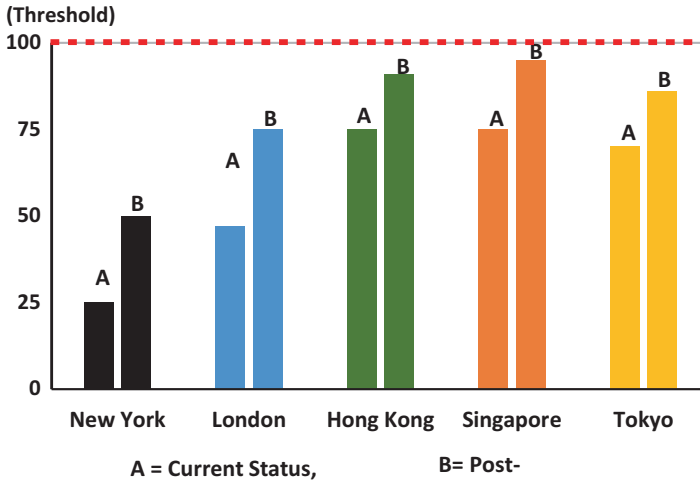
^aSaudi Aramco audited accounts not available as of date of publication

On the surface, Table 5.11 suggests that, under the current company's pre-IPO readiness status, Saudi Aramco does not meet any of the full listing requirements of the five stock exchanges. However, the situation can substantially change once the company submits relevant documents to support its IPO listing which will include audited accounts to IFRS/US GAAP standards, a restructured Board of Directors, including more independent directors, with collective board responsibilities for company accounts. This will reduce the entry barrier level for some of the potential listing markets. There is still a possibility that the London Stock Exchange could allow Saudi Aramco to list, but on condition that the company will not join the FTSE 100 stock index, thus averting confrontation with City of London listed institutions, but on the understanding that buyers of Saudi Aramco shares need to make a conscious decision to invest in an entity that has close and controlling links to the Saudi state. According to some media reports, Aramco could still seek a premium listing awarded under financial conduct authority rules, which are more relaxed on the issue of a smaller "free float" without demanding inclusion in the FTSE 100 index (Raval and Johnson 2007). Whether this will indeed become a realistic option agreeable to all parties is still to be seen as a consequence of noninclusion in the prestigious FTSE 100 index would cut off Saudi Aramco's access to substantial capital inflow, given that the amount of the global stock market controlled by index funds is now substantial, reportedly at around 34% (Raval and Johnson 2007). Of course, there is still an option for a standard listing for Aramco.

In July 2017 the UK's Financial Conduct Authority (FCA) proposed a new premium listing category for sovereign controlled companies which, if accepted, would provide Aramco with a premium listing. In essence, the FCA proposal addresses companies controlled by a shareholder that is a sovereign country similar to Saudi Aramco, and the new proposed premium listing category includes the full suite of investor protection applicable to companies in the existing premium category with two modifications the FCA considers appropriate for companies of this type. These are, *first*, that the related party rules would operate on a modified basis, whereby the sovereign controlling shareholder would *not* be considered a related party for the purposes of the UK listing rules, and *second*, the controlling shareholder rules will *not* apply to companies in the new category in respect of the sovereign controlling shareholder (Financial Conduct Authority 2017).

Figure 5.13 sets out Saudi Aramco's threshold barriers for listing in the five stock markets under current company status and following Aramco restructuring as noted above.

Fig. 5.13 Saudi Aramco's threshold barriers for listing in selected international stock markets under current and post-restructured format



What Fig. 5.13 indicates is that Saudi Aramco has a higher probability of being accepted for listing in the Asian stock exchanges post a company restructuring and that London comes ahead of New York, assuming that the legal JASTA litigation issue is resolved. The above issues concerning the various hurdles faced in the different exchanges have reportedly led to Aramco as well as the country's political leadership to study the issues carefully, leading to possible delays in proceeding with the IPO, with preference split between New York or London (Dummett et al. 2017). However, a successful adoption of the proposed new London premium listing rules as noted above could possibly change the situation in London's favor. Some see this as Britain aggressively courting for the Aramco IPO in a battle with New York, and while the FCA did not explicitly name Aramco when it published the potential new listing rules, the implication was clear (Reed and Merced 2017). The bottom line for these proposed new changes is that any interaction between public sector firms like Aramco and the sovereign that controls it *will not require approval by other shareholders*. The FCA has called for investor feedback before more detailed proposals are put out. UK premium investors remain worried, and according to Chris Cummings, Chief Executive of the Investment Association, "a premium listed without these investor protection is not a premium segment and will not provide the protection that investors expect" (Afanasieva and Denina 2017). According to media reports, Saudi Aramco's financial advisors seem to favor London for the IPO if the new premium listing rules are changed and are not recommending New York due to the more onerous US disclosure rules and that a final proposal would be presented to the Saudi government by late 2017. According to reports, Aramco might miss its IPO window in 2018 if it opted to list in two international markets besides the Saudi Exchange and that, while Chinese IPO participation will be forthcoming in a London listing, there is no appetite to also list in Hong Kong. The reports admitted that Aramco has not yet made a final decision (Azhar et al. 2017).

IPO Options and Valuation

The quality of appointed financial advisors and underwriters play an important role in the success of any international IPO listing, especially if these advisors possess experience in either the relevant listing sector or particular stock exchange requirements. Sometimes rifts may occur between independent IPO advisors and investment bankers eager to underwrite and market the IPO to investors in the hope of earning substantial fees, especially if the IPO is large. According to some observers, this situation might have been inadvertently created by Saudi Aramco's selection of its advisors and underwriters (Donnellan 2007). According to the company, JPMorgan Chase, Morgan Stanley, and HSBC have been appointed as financial advisors, with these banks ultimately being the lead underwriters for the IPO and working as global coordinators (Raval et al. 2017a; Shamseddine and Aswad 2017). The choice of these three financial institutions makes intuitive sense, as JPMorgan is Saudi Aramco's long-standing commercial banker, and, as noted earlier, there are close connections to the bank by the Aramco Chairman Khaled Al Falih who is familiar with its global operations and management and is a member of the bank's international council. Morgan Stanley has experience in mega IPO listings and held the role of global coordinator and book runner on the flotation of *Alibaba*, which in 2014 set a new record for IPOs by raising \$25 billion from investors, while HSBC will bring its ability to tap Asian investors due to the bank's origins in Hong Kong, as well as its long-standing presence in the Middle East (Raval and Kerr 2017). JPMorgan will also be a key player on the execution side, as the bank ranked first in Bloomberg's league table of global equity offerings in 2016, with \$41.3 billion of deals (Keitz 2017).

Besides the above mega banks, Saudi Aramco also appointed Moelis & Co. and Evercore as independent advisors, with these two institutions expected to advise Aramco on the choice of other underwriters, the choice of exchanges in which to list its shares, and the execution of the offering. Moelis & Co. and Evercore join Michael Klein, a former Citibank investment banker to advise the company, as well as White & Case, Saudi Aramco's law firm for decades (Raval et al. 2017a). According to local sources, Saudi Aramco has selected SAMBA capital as one of two banks to work as an advisor on its planned domestic share sale on the Riyadh *Tadawul* stock exchange (Arnold et al. 2017). SAMBA capital is the investment arm of Saudi Arabia's third largest bank by assets, SAMBA Financial Group that was a joint venture with Citibank N.A., before Citibank sold its share to local institutional investors, and SAMBA being one of the more active local investment banks.

Some have commented on the political connections that the independent advisors bring to Aramco, especially Moelis & Co.'s Eric Cantor, a former Republican member of the US House of Representatives and House Majority Leader, and John Alison, former CEO of the Cato Institute, and Evercore's Chairman Roger Altman, who worked at the US Department of Treasury, and fellow Directors Dick Beattie and Curt Hessler who worked at the US Department of State (Keitz 2017). However, whatever political connections these firms might bring to Aramco, they also have Middle East experience, with Moelis acting as the exclusive financial advisor to the

Dubai Government on the \$24.9 billion debt restructuring of conglomerate Dubai World and the \$23.7 billion restructuring of its *Nakheel* real estate subsidiary in 2011. Moelis also worked on the UAE-based Abraaj Group's sale of a 49% stake in Network International in 2015 (Wharton 2017). Besides the above advisors and banks, Aramco has also appointed leading accounting firms like PricewaterhouseCoopers and Ernst & Young to assist with the preparation of the audited accounts.

As part of the IPO preparation, Saudi Aramco has started to take steps to untangle itself from the finances of the Saudi government, how the newly public listed company would pay taxes, and how to determine for various subsidies it receives from the government. All the above will take time to be realized, but the government announced in March 2017 that Saudi Aramco's income tax rate would be reduced to 50% for oil and hydrocarbon producers with capital investments exceeding SR 375 billion (\$100 billion), compared to a previous level of 85% tax rate and a 20% royalty payment (Argaam 2017i; Shamseddine and Rashad 2017). The Royal Decree announcing the change in the tax rate made it retroactive to 1st January 2017. The decree did not mention the royalty, but it is assumed that it would still remain at the 20% level. According to analysts, the tax reduction would likely to significantly reduce Aramco's tax burden and make the firm much more attractive to private investors, sending a strong message to those who doubted that the government is indeed serious about following through on its stated commitment to taking Aramco public. According to Aramco, the decision to cut taxes will help bring the company closer to international standards. Previous to this decision, the government had announced that it might offer shares at a discounted price to the Kingdom's citizens, given some public opposition to the IPO. Shares in companies owned by the Saudi government have traditionally been offered at a nominal value, about SR 10 (\$2.67) each, as a way for the state to redistribute wealth to the population (Argaam 2017h).

The clarification on the tax concession was a vital piece of information for international investors as noted above, and the company has made it clear that Aramco, through its IPO, offers a clear ownership stake on the concession. The Saudi Energy Minister and Aramco Chairman Mr. Khalid Al Falih made this explicit when he noted that "the intent is definitely to have the reserves as part of the offering, so the reserves monetization will be a right within the concession of Aramco. The state will give Aramco, through the concession, the exclusive right to monetize these reserves and the Aramco IPO will offer investors an ownership in that right" (MEES 2017a). However, as pointed out, taxes and royalties are not the only contributions to the Kingdom's finances from Saudi Aramco. The state, as the majority shareholder, will call for maximum dividend payments on a more frequent basis, but this still remains more uncertain for the government compared with a more stable cash flow from taxes and royalties (Fattouh and Harris 2017, p. 5). Some have even argued that the actual impact of the new tax cut is "near-zero" on Aramco's bottom line, as the company is set to pay out almost the same amounts to the Saudi government indirectly in new share dividends as it did directly in tax. The key issue is that no one has revealed what the new dividend policy will be, and international investors

will be aware that the Saudi government will be completely in charge of Aramco's operations as majority owner (Watkins 2017, p. 7).

There is some concern expressed that the new tax and dividend policy post an Aramco IPO would undermine the company's ability to retain funds inside Aramco and, more seriously, would hamper the state's more stable cash flow based on taxes and royalties in favor of uncertain and as yet undefined streams of dividend income, as the cut in tax revenue reductions cannot be fully replaced by dividend payment. One of the key aims of the IPO is to use the proceeds to invest globally and also domestically, to generate alternative and higher non-oil income streams. As the recent global financial crisis has illustrated, such a flow of high and regular dividends from global investments cannot be assured, thus imposing potential stress on public finances and delays the National Transformation Plan's 2020 objective to balance the Saudi budget by 2020. Some have noted that the government could enter into legally binding contracts to fix the tax and royalty rates to show its commitments to low taxation and avoid raising them in the future but that such commitments are not credible in the long term and expose Aramco to unnecessary legal risks (Fattouh and Harris 2017, p. 5). While the above scenario assumes that the tax rate upper ceiling should be capped, there is also the possibility that should the state's fiscal position deteriorate, then further Aramco share tranches are sold. Paradoxically this could also happen should the original objectives to diversify the economy and obtain non-oil revenues succeed, thus justifying the decision to opt for a partial Aramco IPO. Concerning the Kingdom's royalty payment, one possibility is for the Kingdom to link an upward rise in the 20% royalty payment to higher international oil prices as an index-link, whereby the state can raise the level of the royalty based on a pre-agreed formula of oil price increases over a period of time. The agreed-upon base change period (e.g., every 6 months' review), and an oil price rise (e.g., \$10), has to be of a significant nature and with likelihood of a more permanent nature to trigger the upward revision (e.g., staggered 2% levels), to avoid a downward revision in royalty to the 20% floor. Such type of index linking is prevalent among investment bankers as a bonus for superior performance over and above agreed-upon fees and is generally acceptable to investors.

Besides the above fiscal issues, Saudi Aramco is closely interlinked with government policy to provide energy at low prices to national companies, and the government's intentions to implement a market pricing subsidy rationalization policy was discussed in earlier chapters. In the meantime, until new pricing mechanisms take place, Saudi Aramco will have to settle outstanding payments due to it from Saudi companies heavily dependent on subsidized energy supplies from Aramco. According to the Saudi Electricity Company (SEC), the third largest nonfinancial company in Saudi Arabia, SEC said in 2015 that it owed around SR 73.7 billion (\$19.7 billion) to the government and Saudi Aramco for fuel it received from Aramco since 2000 and that other companies like Saudi Arabia Mining Company (*Ma'aden*) disclosed in 2016 that one of its biggest competitive advantages was "access to quality phosphate rock and molten sulphur from Saudi Aramco," although Aramco said that the sulfur is sold on a commercial basis (Scheck 2017).

Since the announcement of the government’s intention to list part of Aramco, at “around” the 5% level, many analysts have published their views and analysis estimating Saudi Aramco’s potential market value in preparation for its IPO. Valuing Aramco presents many challenges, as noted earlier, and the usual valuation methods like price-to-earnings ratio or value per barrel of reserves may not apply to a company whose primary goal is not maximization of shareholder value but has other national, geopolitical and domestic economic, and social development mandates like the high-profile projects of the *Ras Al Khair* maritime yard and other projects not directly involved in oil. These noncore functions may negatively impact Aramco’s valuation. Under such circumstances, investors sometimes discount the value of largely, partial privatized state-owned NOCs to account for political risk. Brazil’s Petrobras, and Russia’s Rosneft to a lesser extent, provide examples of NOCs that have encountered political and corruption challenges that reduced their share price.

Few would disagree that Saudi Aramco is one of the most professionally managed NOCs, and because of its reputation as an “island of excellence,” it has been tasked with other responsibilities in Saudi Arabia. Despite some reservations about the true extent of oil reserves, depending on its final valuation, even the stated aim of a 5% of Saudi Aramco would make it the largest IPO ever in comparison with other mega IPOs as illustrated in Fig. 5.14.

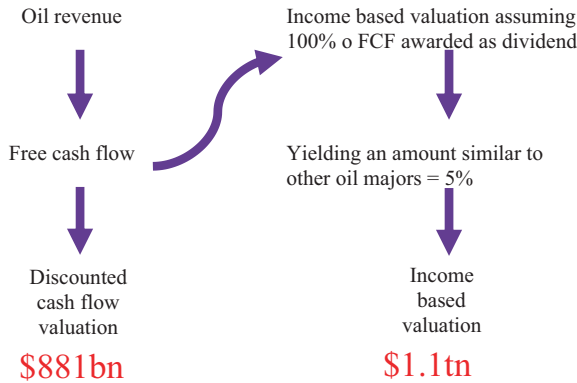
Fig. 5.14 Mega IPO listings 2008–2014



Source: Livsey (2017)

According to the *Financial Times*, Aramco’s total value can be somewhere between \$880 bn and \$1.1 trillion using different methodologies as illustrated in Fig. 5.15.

Fig. 5.15 Estimated Aramco IPO will dwarf previous mega IPOs



*Assumption oil price = \$50 a barrel minimum \$65 long-term, tax rate = 50%
 Source: Livsey (2017)

Even at the lower end of an estimated value for Aramco as a whole, the 5% is likely to be the largest ever, surpassing *Alibaba*’s \$25 billion IPO in 2014, but the key issue for investors will be how transparent the IPO turns out to achieve high valuation and “lift the veil” on Aramco to maximize the return which the government hopes reaches a minimum of \$2.0 trillion (Gross 2017; La Fon 2017; Mekay 2017; Leach et al. 2017).

The estimated IPO valuation range and proceeds to the government from a 5% share offering has varied considerably. According to Boslego, assuming a somewhat higher oil price of \$70 pb, and production of 10 million barrels per day, production costs of \$10 pb, a 20% royalty, and an 85% tax rate, the net present value for Aramco is approximately \$251 billion at a 10% discount rate and \$419 billion at a 50% tax rate. These valuations are significantly lower than the desired \$2 trillion (Boslego 2017a, b).

The above are financial forecasts based upon some basic assumptions. To ensure more reliable IPO estimates, some questions need to be answered by Saudi Aramco such as:

- *Is the company’s crude oil production capacity actually more than the 12 million b/pd. as often officially stated, and is this on a sustainable basis?*
- *Is there a growth strategy for capacity?*
- *What are the true operating costs per barrel, compared with the often cited \$5 per barrel levels, and is this applicable for **all fields** or the new ones, given that more mature fields like Ghawar, as noted earlier, need additional expenditure to maintain a high level of production?*
- *What are the full cycle economics of the major fields?*
- *How much actual debt is on Aramco’s balance sheet, besides the recent dollar sukuk?*
- *What steps is Aramco taking to ensure that it is meeting the threat of climate change policies potentially constraining future oil demand and reaching so-*

called oil peak demand? This is important for investors who are assessing a company with reputed reserves of more than 60 years, and if so, they would need to apply a higher discount rate to Aramco's reserves. There is no guarantee that a barrel of oil could be sold for either \$80 or even \$10 a barrel in 50–60 years.

While oil peak demand might seem a distant reality, major companies like Toyota Motor Corp. wants to rely on hydrogen to all but replace traditional engine models by 2050. Despite President Trump's decision to withdraw the USA from the Paris Climate Change Accord in 2017 (Crilly 2017), the global pressure to act on redressing the effect of global warming is still a commitment by many energy-consuming countries, with major polluters like India and China still committed to the Paris Accord. Should these climate change commitments and fossil fuel emission reductions take place, it will only be a matter of time before reserves become *stranded* reserves in the ground.

There are several methods of company valuation, and some are more suitable for energy companies. In summary, the valuation of any company consists of a process aimed at *estimating* its value by using one or more specific methods. In the final analysis, the integrity of the data used and its verification by independent third parties is crucial, irrespective of which method is finally chosen. The most common knowledge in the financial markets is that a company can be evaluated on the basis of the cash flows it will produce in the future. Any preliminary valuation for a stock exchange listing aims to contribute to the pricing process for stocks to be placed with investors. The *Discounted Cash Flow (DCF)* method is probably recognized today as the most reliable of the modern corporate theories that aims to correlate the value of a business to its capacity to produce a cash flow stream to satisfy returns expected by investors. The main methodological assumption inherent in the application of the DCF is the *Operating Free Cash Flows (OFCF)* which is calculated as follows:

Operating Income (EBIT)

- *Income taxes on operating income*
- = Net operating income
- + Depreciation/amortization
- + Provision and other noncash items
- +/- Decreases/increases in net working capital
- *Investments in fixed assets (net of divestments)*
- = *Operating Free Cash Flow (OFCF)*

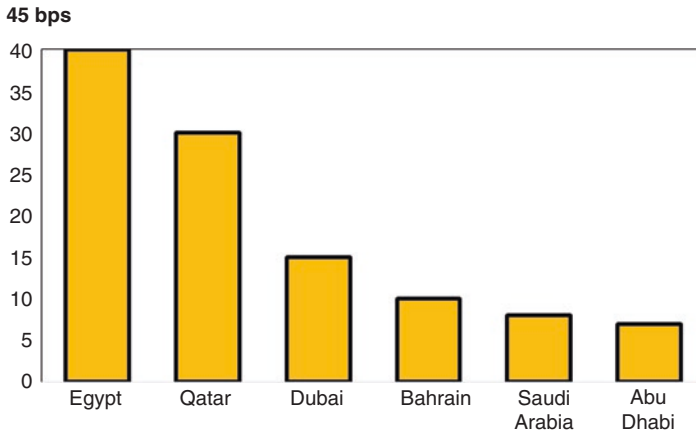
The rate used to discount the expected cash flows is the “weighted average cost of capital” (WACC), which takes into the account the specific risk of the company, both operating and financial. Another valuation method, which offers a different representation of value with respect to the DCF, is the *economic value-added (EVA)* method. EVA is a method of determining the performance of a company correlated with the objective of maximizing shareholders value, and it is used to measure the value created or the residual profit after deducting the cost of capital employed used to gener-

ate that profit. However, using this method by merely examining a company's accounting results has some limitations due to the incompleteness of the accounting system, which does not represent the true performance of operations. The above traditional methods such as DCF and EVA are commonly applied to energy companies. Calculating an annual cash flow and then subtracting capital expenditures leave a free cash flow figure, which when discounted and added up over time leads to a valuation. Former Aramco CEO Mr. Khalid Al Falih had estimated both operating expenses and capital spending at \$40 billion annually for the next decade in 2014 (Livsey 2017). In 2015, Saudi Aramco announced a \$334 billion capital expenditure program for the 10-year period 2015–2025 (Al Yami 2015), implying an annual capital expenditure of \$33 billion per annum, with a further \$7 billion in annual operating expenses according to the Minister's statement in 2014.

As noted earlier, the rate used to discount the expected cash flow takes into account company operating and financial risk and for NOCs also sovereign risk. Traders tend to demand discounts for such political risks surrounding state-linked companies. As noted earlier in the case of Petrobras, the corruption scandal engulfing the company, the so-called operation car wash, had sent Petrobras shares sliding to a 16-year low in 2016, and Rosneft's shares have been affected by ongoing US and European sanctions on Russia that have limited the stock's upside versus emerging market peers (Blas and Mahdi 2017).

Despite some random domestic terrorism acts, Saudi Arabia has been relatively more stable in a turbulent Middle East. A large element has been due to the use of the Kingdom's oil wealth to distribute among its citizens and ride out the so-called Arab Spring upheavals (Ramady 2014). Ensuring that a post-privatized Saudi Aramco continues to generate the same level of royalty and dividends to manage such social expectations is important and underscores the earlier criticisms leveled against the planned IPO by some sections of Saudi society. The sudden and unexpected rift between Qatar and other fellow members of the Gulf Cooperation Council (GCC) – Saudi Arabia, the United Arab Emirates, and Bahrain – in mid-2017 leading to diplomatic breakdown and other sanctions against Qatar, made S&P downgrade Qatar's debt rating to AA- from AA, with S&P adding that they expect "Qatar economic growth will slow, not just through reduced regional trends, but as corporate profitability is damaged because regional demand is cut off, investment is hampered and investment confidence wanes" (Torchia 2017b). The knock-on effect might not only be confined to Qatar, as it is investor's perception about the Gulf region that might be affected. Compared to the wider Arab world, the Gulf countries and their assets have been seen as a safe bet for investors in Middle Eastern emerging markets, but this could now change. While this could have been a short-term reaction to the Qatar dispute with the other GCC members, the cost of protecting against a sovereign default for 5 years climbed, not just for Qatar, but also for Egypt, Saudi Arabia, Dubai, Abu Dhabi, and Bahrain (Pacheco 2017). This is illustrated in Fig. 5.16.

Fig. 5.16 Cost of hedging against sovereign default following the Qatar Gulf crisis June 2017 for Egypt, Qatar, Dubai, Bahrain, Saudi Arabia, and Abu Dhabi



Source: Pacheco, 15 June 2017, Bloomberg

From Fig. 5.16, the sharpest rise in cost of hedging against a default was for Egypt and stood at nearly 40 basis points (bp), with Qatar the second highest at around 31 bp, while Saudi Arabia's cost of hedging increased to around 10 bp. The key point is that an increased sovereign risk for one country can become contagious to others involved in a dispute, creating unintended consequences. While the average spread paid by governments in the Middle East to borrow in the bond markets rose by around 7 bp, this compares with a 3 bp *decline* for emerging market debt according to JP Morgan Chase & Co. Indexes (Pacheco 2017).

Saudi Aramco is fully aware of the range of risks that it faces and listed these in its debut SR 37.5 billion *sukuk* issuance program in March 2017 (Saudi Aramco 2017e). Table 5.12 summarizes some of these key risks that are also applicable to the planned Aramco IPO listing.

Table 5.12 Saudi Aramco risk factors

Risk factor	Key aspects
<ul style="list-style-type: none"> • Risk related to Saudi Aramco's industry and business 	<ul style="list-style-type: none"> • Saudi Aramco is exposed to fluctuating prices of crude oil, natural gas, oil products, and chemicals, and such fluctuations could have adverse effect on Aramco's business, including on its cash flows and earnings. Additionally low oil prices have resulted and could result in reserve de-booking of proved oil and gas reserves if they become uneconomic • Saudi Aramco's ability to achieve strategic objectives depends on how it reacts to competitive forces, and any failure by Saudi Aramco to secure key supply contracts and/or access to desirable projects could result in a material adverse on Aramco's business, cash flows, and financial conditions • Saudi Arabia may be subject to natural disasters, terrorist activities, and/or other disruptive geopolitical events and their consequences • Saudi Aramco's production capacity, facilities, and business is subject to operational risks, and there is no assurance that Saudi Aramco's insurance will be sufficient to cover fully all potential hazards and risks to which Saudi Aramco will be exposed • Saudi Aramco's operations are subject to various environmental and other laws and regulations; and there cannot be any assurance that environmental laws will not change or become more stringent in the future, and if Aramco does not comply, then it could be fined or open to litigation • Saudi Aramco is exposed to risks related to conducting operations in several different countries, and the company's business is subject to risks related to differing legal, political, social, and regulatory requirements and economic conditions of multiple jurisdiction • Many of Saudi Aramco's major projects and operations are conducted in joint arrangements or with associates which could reduce Saudi Aramco's degree of control as well as its ability to identify and manage risks • Saudi Aramco's future hydrocarbon production depends on the delivery of large and complex projects, as well as on Saudi Aramco's ability to replace proved oil and gas reserves • The estimation of proved oil and gas reserves involves subjective judgments based on available information and the application of complex rules, so downward adjustments are possible
<ul style="list-style-type: none"> • Risk relating to the Kingdom and the wider MENA region 	<ul style="list-style-type: none"> • A slowdown in the economies of the Kingdom's key trading partners could adversely affect Saudi Aramco. The Kingdom has strong trading relationships with many countries and particularly the major oil-importing countries in Asia, North America, and Europe, and if there is a slowdown in the economies of any of these countries, this may have a negative impact on Saudi Aramco's sales of crude oil, refined products, and petrochemicals which would have a material adverse effect on Saudi Aramco's business, prospects and financial condition

Source: Saudi Aramco (2017e), SR 37.5 billion Sukuk Issuance Program, pp. 14–20

From Table 5.12, Saudi Aramco can mitigate and reduce some of the internal operational risks such as implementing advanced security measures against infrastructure and ITC attacks, proactive environmental programs, and delegation to local management in international joint venture operations as well as avoiding jurisdictions with frivolous litigation legal systems. The devastation left behind by Hurricane Harvey in Texas in September 2017, and the shutting down of all major refineries in the Port Arthur area, including Aramco's Motiva, the largest refinery in the USA, demonstrated the extent of natural disaster risk. The risk of attacks on Aramco's infrastructure is however present as demonstrated when the company foiled such incidents in April 2017 to blow up the *Jazan* oil terminal and an attempted sea attack in June on the *Marjan* offshore oil field (Zareen 2017).

Saudi Aramco can also ensure that it attracts as well as retains key personnel and that senior management possess a wide range of experience in various business segments to ensure that there is depth in skills as noted in our assessment of Aramco's management. However, Table 5.10 illustrates that Saudi Aramco has less flexibility in mitigating *external market-related risks*, especially concerning commodity price fluctuations, although it could aim to influence this through coordinated policies between OPEC and non-OPEC members, as well as opening new export markets for its crude and refined products.

The above factors, uncertain future commodity pricing, and lack of audited financials from Saudi Aramco, especially concerning cost of production per barrel, underscores the hurdles faced in trying to place an accurate valuation on the company. The section that follows attempts this based on several assumptions and scenarios.

What Value for Aramco?

Whatever a value is assigned for Saudi Aramco, the results are most sensitive to assumed oil prices, particularly in the near and medium term, and whether these prices can be sustained. As noted earlier, the Saudi government has made it clear that Aramco has to execute the Kingdom's OPEC policy and any other international energy agreement obligations. A move that sacrifices short-term revenues to boost long-term objectives could be rational for a country but negative for investors with higher discount rates and shorter-time horizons. Aramco's estimated value will necessarily involve a lot of assumptions, pending financial disclosures by the company. In essence a valuation will depend primarily on three variables: *oil prices, oil production, as well as cost of production*. A reasonable valuation has to be done on a bottom-up basis, estimating future cash flows and discounting them back to the present at a reasonable rate of around about 8–10% a year (Mills 2016).

The issue of disentangling Aramco from government finances and producing a set of financial data to investors ahead the planned IPO is being taken seriously. It is

reported that the company will present its 2015 and 2016 financial statements, alongside pro-forma accounts for 2017, as well as shifting historical debts from foreign governments, including Jordan and Iraq, from Aramco's accounts on to the government's books. The company will also need to create a mechanism via a special tax deduction, to compensate Aramco for this financial cost of subsidizing fuels such as petrol for domestic motorists and gas power for generation. Furthermore, payments that state entities such as national airline *Saudia* and the Saudi Electricity Company owe to Aramco will be moved to the Saudi Finance Ministry (Raval 2017a), as noted earlier in the chapter.

Table 5.13a and 5.13b set out estimated Saudi Aramco valuation of the company based on a \$6 pb production cost in Table 5.13a and \$12 pb production cost in Table 5.13b. Most analysts have tended to assume a low production cost pb level for Aramco, but as noted earlier, the company is embarking on substantial capital expenditure programs, and the assumed higher production cost level takes this capital depreciation into account. Both sets of data assume a daily average production level of 10 million bpd, a 20% royalty rate which is not forecasted to be changed in the immediate term, and a tax rate of 50% as recently announced by the government (Argaam 2017j). Oil prices are forecasted from \$40 pb to \$70 pb rising in \$5 bands. Both tables also assume a P/E ratio of 10 to arrive at Aramco's market capitalization to derive the expected proceeds from a 5% flotation. A discount rate of 10% is used to calculate the company's net present value (NPV) based on 60 years of production given current announced reserves. The discount rate is probably higher than IOC peers at around 5–6%, but the higher level takes into account the longer reserve period and political risk uncertainty.

Table 5.13a Estimated Saudi Aramco valuation based on different oil prices and cost of production scenarios (\$6 per barrel) and 20% royalty, 50% tax, and 10 mbpd

Oil price per barrel	\$40	\$45	\$50	\$55	\$60	\$65	\$70
• Production value mbpd (3.65 billion p.a.)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
• Production period (years)	60	60	60	60	60	60	60
• Gross revenue p.a. (\$Bn) (production × 365 days)	\$146 bn	\$164.3bn	\$182.5bn	\$200.8bn	\$219.8b	\$237.3bn	\$255.5bn
• Production cost (\$pb)	(\$6)	(\$6)	(\$6)	(\$6)	(\$6)	(\$6)	(\$6)
• Royalty (20%) (\$pb)	(\$8)	(\$9)	(\$10)	(\$11)	(\$12)	(\$13)	(\$14)
• Royalty (\$bn)	\$29.2bn	\$32.9bn	\$36.5bn	\$40.2bn	\$43.8bn	\$47.5bn	\$51.1bn
• Gross margin (\$pb)	\$26	\$30	\$34	\$38	\$42	\$46	\$50
• Gross income (\$ Bn)	\$94.9bn	\$109.5bn	\$124.1bn	\$138.7bn	\$153.3bn	\$167.9bn	\$182.5bn
• Tax 50% (\$pb)	(\$13)	(\$15)	(\$17)	(\$19)	(\$21)	(\$23)	(\$25)
• Tax income (\$Bn)	\$47.4bn	\$54.8bn	\$62.1bn	\$69.4bn	\$76.7bn	\$83.9bn	\$91.3bn
• Net revenue (\$pb)	\$13	\$15	\$17	\$19	\$21	\$23	\$25
• Annual (\$Bn)	\$47.4bn	\$54.8bn	\$62.1bn	\$69.4bn	\$76.7bn	\$83.9bn	\$91.3bn
• PE ratio (×10) market capitalization (\$Bn)	\$474bn	\$548bn	\$621bn	\$694bn	\$767bn	\$839bn	\$913bn
• 5% IPO proceeds (\$Bn)	\$23.7bn	\$27.4bn	\$31.0bn	\$34.7bn	\$38.4bn	\$42.0bn	\$45.7bn
• Discount rate	10%	10%	10%	10%	10%	10%	10%
• NPV (\$Bn)	234	262	288	315	342	379	406

Source: Author's estimations

Using the lower production cost of \$6 pb in Table 5.13a, it becomes clear the significant impact that changes in forecasted oil prices play in the estimated valuation of the company. The sensitivity of oil prices to Saudi fiscal fortunes has been often noted, with some estimating that a \$1 increase in average oil prices over a year reduces the Saudi budget deficit by between 0.3 and 0.4 percentage points if spending remains steady, while others have calculated that a \$10 pb swing in oil prices could make a difference of hundreds of millions of dollars to Aramco's IPO valuation, such as Sanford C. Bernstein's estimation that Aramco would make a net profit of \$13.30 a barrel with oil at \$50 pb, but \$16.90 at \$60 pb (Torchia 2017a).

The results from Table 5.13a indicates that, under the assumptions made, Saudi Aramco's net revenue would be around \$47.4 billion per annum at \$40 pb oil prices and reach \$91.3 billion per annum at \$70 pb oil prices. With oil prices hovering between the \$45 and 55 levels during 2017, the estimated annual net revenue would be \$54.8 billion, \$62.1 billion, and \$69.4 billion, respectively. Based on the assumptions made, and using the lower production cost per barrel, the expected IPO proceeds from a 5% listing would reach around \$24 billion at \$40 pb oil prices and \$46 billion at \$70 pb oil prices. This is far less than the hoped for \$100 billion based on a \$2 trillion valuation when the Aramco IPO was first announced. Based on a 10% discount rate, and taking into consideration 60 years of income, the NPV valuation reaches \$234 billion at \$40 pb prices and \$406 billion at \$70 per barrel prices, implying that a 5% IPO based on a discounted NPV basis would raise around \$12 billion at \$40 pb and \$20.3 billion at \$70 pb. The latter figure is in line with NPV estimations reached by others using \$70 pb oil prices, but assuming an 85% tax rate for the company, to arrive at \$251 billion or \$12.5 billion as proceeds from a 5% IPO (Boslego 2017b). Assessing the Aramco IPO valuation based on \$12 pb production cost in Table 5.13b, it indicates an even lower range of IPO proceeds.

Table 5.13b Estimated Saudi Aramco valuation based on different oil prices and cost of production scenarios (\$12 per barrel) and 20% royalty, 50% tax, and 10 mbpd

Oil price per barrel	\$40	\$45	\$50	\$55	\$60	\$65	\$70
• Production value mbpd (3.65 billion p.a.)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
• Production period (years)	60	60	60	60	60	60	60
• Gross revenue p.a. (\$Bn) (production × 365 days)	\$146 bn	\$164.3bn	\$182.5bn	\$200.8bn	\$219.8b	\$237.3bn	\$255.5bn
• Production cost (\$pb)	(\$12)	(\$12)	(\$12)	(\$12)	(\$12)	(\$12)	(\$12)
• Royalty (20%) (\$pb)	(\$8)	(\$9)	(\$10)	(\$11)	(\$12)	(\$13)	(\$14)
• Royalty (\$bn)	\$29.2bn	\$32.9bn	\$36.5bn	\$40.2bn	\$43.8bn	\$47.5bn	\$51.1bn
• Gross margin (\$pb)	\$20	\$24	\$28	\$32	\$36	\$40	\$44
• Gross income (\$ Bn)	\$73.0bn	\$87.6bn	\$102.2bn	\$116.8bn	\$131.4bn	\$146.0bn	\$160.6bn
• Tax 50% (%pb)	(\$10)	(\$12)	(\$14)	(\$16)	(\$18)	(\$20)	(\$22)
• Tax income (\$Bn)	\$36.5bn	\$43.8bn	\$51.1bn	\$58.4bn	\$65.7bn	\$73.0bn	\$80.3bn
• Net revenue (\$pb)	\$10	\$12	\$14	\$16	\$18	\$20	\$22
• Annual (\$Bn)	\$36.5bn	\$43.8bn	\$51.1bn	\$58.4bn	\$65.7bn	\$73.0bn	\$80.3bn
• PE ratio (×10) market capitalization (\$Bn)	\$365bn	\$438bn	\$511bn	\$584bn	\$657bn	\$730bn	\$803bn
• 5% IPO proceeds (\$Bn)	\$18.3bn	\$21.9bn	\$25.5bn	\$29.2bn	\$32.8bn	\$36.5bn	\$40.2bn
• Discount rate	10%	10%	10%	10%	10%	10%	10%
• NPV (\$Bn)	194	221	265	285	306	343	385

Source: Author's estimations

The estimated annual net revenue is now reduced to \$36.5 billion at \$40 pb and \$80.3 billion at \$70 pb. At the \$55 pb oil price level, this reaches \$58.4 billion, with \$29.2 billion raised through a 5% IPO, and \$40.2 billion at a \$70 pb oil price. The estimated NPV is also reduced to around \$194 billion at \$40 pb oil prices and \$385 billion at \$70 pb. The estimated 5% IPO amount raised would then be \$9.7 billion at \$40 pb and \$19.3 billion at \$70 pb at the assumed 10% discount rate for 60 years of forecasted production. Is this realistic?

In keeping with the SEC formula, the value of a barrel of oil which is *not* produced until 10 years from now is discounted by about a 60% discount rate, and if oil is not to be monetized for 40 years, its present value shrinks by 97.8%. According to some (Foreign Reports Inc. 2016), the 10% discount rate may be inappropriate for Saudi Aramco, as the market may believe that oil is an *appreciative asset*, potentially gaining in value more than the foregone opportunity cost of money. This view occurs when oil prices are at historically high levels, and the markets only start to worry that oil is a *depreciative asset* when prices are low. The question is then posed: *given the emergence of shale oil as a competitor to traditional producers and becoming the emergent oil swing producer, coupled with technological advances that can open up new production horizons both onshore and offshore, making current uneconomic fields become economic to exploit, can oil prices reach again the \$100 pb levels in the future?* An alternative view is that the current oil bust will inevitably lead to another oil price boom, to the detriment of many developing countries.

This view point was put very eloquently by Saudi Energy Minister Khalid Al Falih at the annual IHS CERA Week Conference in Houston in March 2017, when he noted that “neither climate change policies, nor technology shifts have quenched the insatiable thirst for oil and underinvestment amounts to nothing more than compromising the world’s energy security” (Eaton 2017). According to OPEC’s Secretary General Mohammed Barkindo, by 2040, the energy industry will need to plough \$10 trillion into new projects as demand grows by 17 million barrels per day (Eaton 2017). The message was simple: investments need to be made today to avoid future oil price spikes. If the Saudi government wanted to deplete its oil reserves over a shorter period of 10–12 years in order to maximize their “present value,” it would have to change drastically its current oil production policy and sell around 22–24 billion barrels a year or around 60 million bpd. Producing six times as much oil as it is producing today of around 10 million bpd, even if technically feasible, would flood the world’s market and lead to dramatically lower oil prices and hasten the day when Saudi Arabia exhausts its hydrocarbon potential, assuming no new reserves are found (Simmons 2006).

One of the criticisms raised against the planned IPO is that the state will lose revenue by giving up the national “cash cow.” Table 5.14 estimates the annual revenue that will accrue to the state as well as to private investors after an IPO, based on different oil price scenarios. The estimations are also based on \$12 pb production costs derived from Table 5.13b.

Table 5.14 Saudi Arabia estimated per annum post-IPO government and private investors' revenues based on different oil price scenarios and \$12 pb production cost

Oil price (\$ pb)	\$40	\$50	\$55	\$55	\$60	\$65	\$70
(A) Government revenue post IPO:							
• Royalty (20%) \$ Bn	29.2	32.9	36.5	40.2	43.8	47.5	51.4
• 50% Tax \$ Bn	36.5	43.8	51.1	58.4	65.7	73.0	80.3
• Dividend (\$ Bn) (95% of 15% payout)	4.21	5.24	6.29	7.32	8.36	9.41	10.35
Total \$Bn	69.91	81.94	93.89	105.92	117.86	129.91	142.05
(B) Income after 50% govt. tax	36.5	43.8	51.1	58.4	65.7	73.0	80.3
(a) Aramco operating expenses (\$ Bn pa)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)
(b) Net income	29.5	36.8	44.1	51.4	58.7	66.0	73.3
(c) Dividend 15% (\$ Bn)	(4.43)	(5.52)	(6.62)	(7.71)	(8.80)	(9.9)	(10.9)
(d) 5% of dividend payout (\$ Bn)	0.22	0.28	0.33	0.39	0.44	0.49	0.55
(C) Private investors revenue (b) plus (d) \$ Bn	29.72	37.08	44.43	51.79	59.14	66.49	73.85

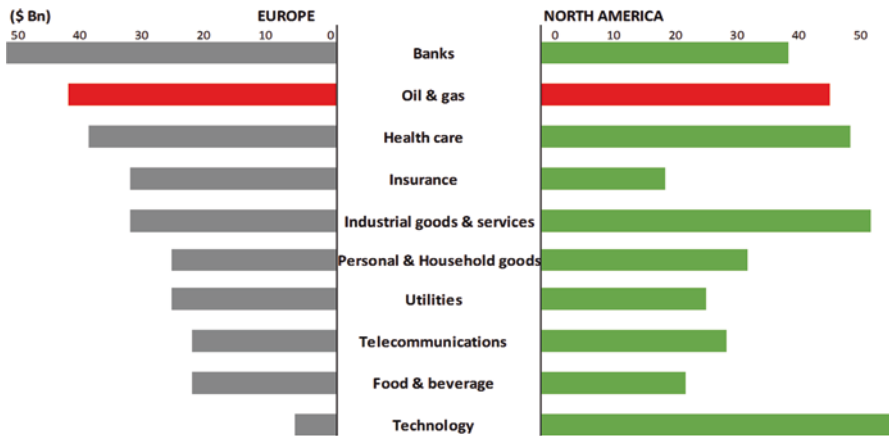
Source: Author's estimations

In Table 5.14, the government's royalty payment is set at 20%, as well as the 50% tax revenue, and both are closely related to the level of oil prices. The table sets out income due to private investors out of the remaining 50% revenues, after deducting Aramco's operating annual expenses, set at around \$7 billion per annum as noted earlier in the chapter and based on Aramco's own estimations. Capital expenditure of around \$33 billion per annum is capitalized in the \$12 pb production cost. Table 5.14 assumes a 15% dividend payout by Aramco on net income and distributed according to Aramco's shareholder ownership of 95% government and 5% private investors. As long as Saudi Aramco has a majority government shareholder, what it might lose out in taxes to private investors, it returns to its majority shareholder in dividends. From Table 5.14, the estimated dividend income to the government is around \$4.2 billion at \$40 pb and \$10.4 billion at \$70 pb, with the corresponding amount accruing to the 5% private shareholders representing \$220 million and \$550 million per annum, respectively. The total estimated private investors' revenue is around \$30 billion p.a. at \$40 pb oil prices and around \$74 billion at \$70 pb.

Saudi Aramco has not yet announced in detail its future dividend policy and payout rate to ensure that it is in line with the local stock exchanges dividend payouts which range between 12% and 15% for listed Saudi petrochemical companies and 10% and 12% for cement and telecommunications in 2015. However, the Saudi Basic Industries Corporation (SABIC) announced a cash dividend payout of 20% for Q1 2017. Our assumed 15% dividend payout for Saudi Aramco generally

compares favorably with local Saudi listed companies but is far lower than the 35% dividend payment that the Russian government demands from its state-owned NOCs in a move to boost both government coffers and private investors. Rosneft, the world’s largest listed oil producer by output, has said it plans to pay 35% of its 2016 earnings in dividends (Foy 2017). The high dividend payout rate by Rosneft is not peculiar to the company, as oil companies are big dividend payers, second to the banking sector as illustrated in Fig. 5.17.

Fig. 5.17 Comparative dividend payout (\$ bn) by sector for European and North American Companies, 2016



Source: Raval (2017b), Financial Times

Following the announcement of the new Aramco tax rate by Royal Decree in March 2017 to 50% from 85%, the Saudi Ministry of Finance stated that any tax revenue reductions are to be replaced by stable dividend payments by the affected hydrocarbon companies and other sources of revenue including profits resulting from investments. The ministry statement implies that the difference between the old and new tax regimes would now be paid as dividends, and by implication, there would be no change to total government revenue but that the change will eventually be under the government’s financial statement whereby oil revenues will decline, but at the same time there will be an equivalent rise in non-oil, investment income. However, given that following an Aramco IPO, the remaining Aramco ownership (95%) will be transferred to the Public Investment Fund (PIF), there will need to be detailed disclosure of Aramco’s dividend payments transferred from the PIF to the Ministry of Finance to be able to assess how much of Aramco’s dividend payments contribute to investment income versus PIF’s income from its domestic and international investments (Jadwa Investment 2017b, p. 9). According to the Saudi Ministry of Finance, the Q1 2017 actual budget results indicated that total investment non-oil income earned by the Saudi Arabian Monetary Authority (SAMA) and the PIF amounted to SR 18.2 billion (\$4.9 billion) and oil revenue, including petrochemicals,

reached SR112 billion or \$29.9 billion (Ministry of Finance 2017). Annualizing these returns for full year 2017 indicates that investment income would amount to SR 72.8 billion or \$19.4 billion and oil income SR 448 billion or \$119.5 billion. In 2016, actual oil revenue reached SR 329 billion (\$87 billion), while SAMA's investment return was SR 62 billion or \$16.5 billion, with lower oil prices affecting oil income as well as lower interest rates in 2016. From the above analysis, an oil price minimum average benchmark of \$60 pb is required to reach the estimated FY 2017 oil income, as Table 5.14 indicates that at this oil price level, the government's post-IPO revenue would be around \$118 billion. An average oil price of \$50 pb will not compensate for oil revenue losses at the new 50% tax rate, with estimated oil revenues from Aramco at around \$82 billion. However, the estimated government revenues in Table 5.14 do not take into account additional revenue from wholly owned and joint venture petrochemical entities. Given potential oil revenue losses that the state might incur if the Aramco IPO is carried out when oil prices are stressed and under the \$50–55 pb levels, what are the alternatives open to the government to raise capital besides an IPO option? Table 5.15 sets out the cost of borrowing equivalent amounts as those raised from IPO proceeds at different oil price levels and using different average cost of production per barrel scenarios.

Table 5.15 Saudi Aramco option of raising IPO proceeds versus borrowing the same amount for 10 years at different oil price scenarios

Oil prices \$ per barrel	\$40		\$45		\$50		\$55		\$60		\$65		\$70	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b
• Estimated company valuation (\$ Bn)	474	365	548	438	621	511	694	584	767	657	839	730	913	803
• Estimated IPO proceeds (5%) \$ Bn	23.7	18.3	27.4	21.9	31.0	25.5	34.7	29.2	38.4	32.8	42.0	36.5	45.7	40.2
• Cost of borrowing same amounts as IPO proceeds for 10 years at 3.75% p.a.^a (\$ Bn)	(0.88)	(0.68)	(1.02)	(0.82)	(1.16)	(0.96)	(1.30)	(1.09)	(1.44)	(1.23)	(1.58)	(1.37)	(1.71)	(1.51)
	8.9	6.8	10.3	8.2	11.63	9.8	13.0	10.95	14.4	12.3	15.8	13.69	17.13	15.1

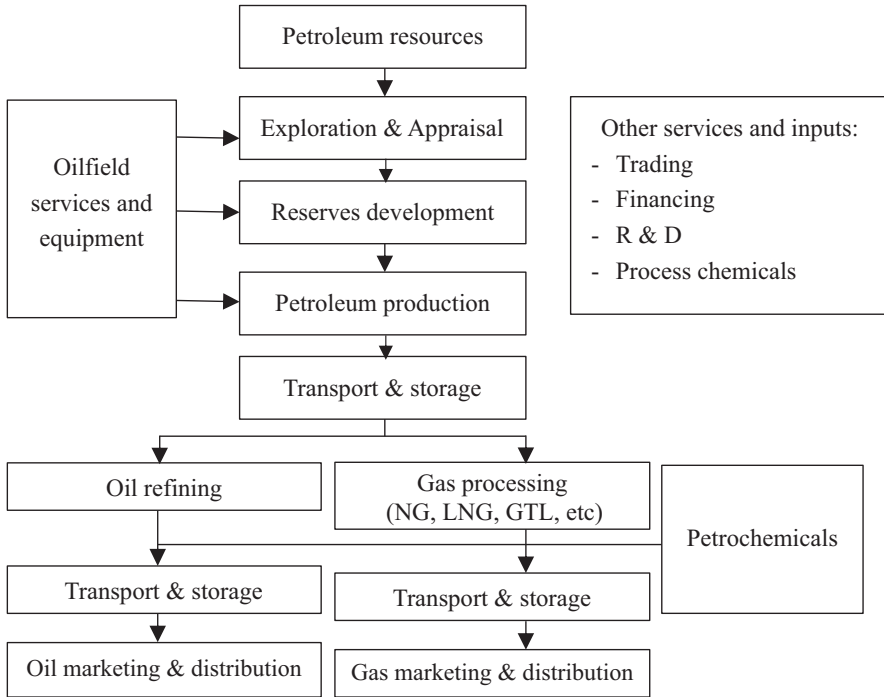
Note: (a) = Using Aramco average cost of production \$6 per barrel. (b) = Using Aramco average cost of production \$12 per barrel
^a10-year treasury rate of 3.75% used, compared with 3.25% for Saudi 10-year dollar bond issuance in Oct. 2016 (Moore and Kerr 2016)

From Table 5.15, assuming the IPO proceeds raised from a 5% listing, and a lower production cost of \$6 per barrel and oil prices at \$70 per barrel, the cost of borrowing \$40.2 billion for 10 years at 3.75% is lower at \$15.1 billion in interest paid, indicating a saving of \$25 billion over IPO proceeds. The 10-year interest rate of 3.75% used is 0.50% higher than the actual rate obtained by the Kingdom in its 10-year dollar bond issuance in October 2016, which reached book orders of \$67 billion before the Kingdom opted to borrow \$17.5 billion in 5-, 10-, and 30-year tranches at 5.25%, 2.375%, and 4.5%, respectively. The Saudi sovereign bond issue was the largest in 2016, surpassing Argentina's \$16.5 billion bond in the same year (Sharif et al. 2016). The fact that the Kingdom raised more in the longer 30-year tenor (\$6.5 billion) compared with \$5.5 billion in the short and medium tenors indicate that long-term investors, such as sovereign wealth funds, especially from Asia, were interested in buying Saudi debt and that there was Saudi borrowing capacity on the international capital markets. During the Saudi-China Jeddah Investment Forum held in August 2017, the Kingdom announced that it was willing to consider raising funds in the Chinese *yuan* currency to give itself a broader range of market liquidity access as well as announcing plans to establish a \$ 20 billion joint 50:50 investment fund with China (Shamseddine and Paul 2017b). The fact that Saudi Arabia held \$73 billion of direct government debt as of the end of August 2016, \$63 billion of which was raised from local banks, and with a debt to GDP ratio of 13%, one of the lowest in the G20 group of countries, ensured that there remains significant investor interest. The forecast for 2017 is for total debt level to reach around SR 450 billion or \$120 billion, representing 17% of GDP (Jadwa Investment 2017b).

The Downstream Sector Could Add to the IPO Valuation

As noted above, the Aramco IPO's final shape on whether it will only involve the upstream, or oil production, or whether it will also include the downstream petrochemical and refinery business is still be finally clarified and which could add a significant valuable component to the proposed IPO. The downstream sector provides producing nations like Saudi Arabia with a diversified business model, and the company has made it clear that it will pursue expanding its downstream operations, both within the Kingdom and abroad. In order to be active in the downstream sector, an NOC needs to be involved in many or all of the various elements that goes into the industry's "value chain" which includes development, processing, transportation, and marketing of hydrocarbon. This is illustrated in Fig. 5.18.

Fig. 5.18 Petroleum value chain



Source: Tordo et al. (2011, p. 2)

NOCs differ in a number of important variables concerning participation in the petroleum value chain, including the level of competition in the market in which they operate, their business profile along the value chain, their degree of commercial orientation, and their internationalization focus (Al Moneef 1988). Our earlier assessment of the four partially privatized NOCs indicated varying degrees of involvement in the “value chain.” By all accounts, Saudi Aramco is involved in all the petroleum value-chain processes, including possessing its own commodity trading unit, R&D, and process chemicals, as well as transportation through the company’s wholly owned subsidiary *Vela International Marine Ltd.*, and possessing one of the world’s largest very large crude carriers (VLCCs) and ultra large crude carriers (ULCCs) fleet in the world (Saudi Aramco 2011b).

According to reports, Aramco has no intention of opting out of its array of joint ventures ahead of the IPO, and, according to Aramco’s CEO Mr. Amin Nasser, “when we talk about listing, this means listing of the whole of Aramco with our JV’s” (Raval 2017b). However, as noted earlier in the chapter, while refining joint ventures with France’s Total in the *SATORP* refinery or with the USA’s Dow Chemical in *SADARA* clearly fall within the remit of an oil and gas producer, Aramco has other JV partnerships that fall outside their core business model like the Marine Shipyard Complex with Hyundai Heavy Industries in *Ras Al Khair*.

Such noncore activities, along with other social- and government-related projects and initiatives, could burden Aramco, and one possibility would be to hive off these activities into a separate subsidiary prior to the IPO, or soon after, but this requires a change of the company's culture and a wider public perception that Aramco is an indispensable vehicle in Saudi Arabia's social and economic transformation plans.

Saudi Aramco has previous experience in listing part of its stake in petrochemical joint ventures and had offered shares to Saudi citizens on the local stock market by selling 25% of the JV Saudi Aramco-Sumitomo Chemical Company of Japan, *Petro Rabigh* in 2008, with Aramco and Sumitomo each retaining 37.5% stake in the project which cost \$9.8 billion to construct, and had an estimated market capitalization value of \$8.94 in 2016 (La Fon 2017), but stood at SR 306 billion or \$81 billion in June 2017 as profitability and share prices rallied. As noted in earlier chapters, Aramco owns 50% or greater stakes in four other domestic refining joint ventures and total ownership of five domestic refining subsidiaries and four international joint ventures. Some see these assets as less risky and, given the availability of audited financial accounts, are more likely to go public and easier to value than the parent company. According to reports, Saudi Aramco plans to cut its 65% stake in *Sadara Chemical Company*, by 30% through an IPO to take place after Saudi Aramco's planned IPO in 2018. According to *Sadara's* former CEO Ziad Al Labban, the proposed sale would aim to even Aramco's shares with Dow's 35% stake in *Sadara*, similar to the Sumitomo shareholding structure (Argaam 2017i).

Valuing downstream operations is a complex matter, as there are different ways to value refining assets, many of which use a measure of their ability to turn different kinds of crude oil into much higher value products. According to some analysts, Saudi Aramco's total refining assets might be valued at a bit less than \$40 billion, but this did not include *Sadara* (Foreign Reports Inc. 2016). The company's wholly owned domestic refineries are of different ages, but some have been upgraded, and valuing them on the same basis could be problematical, issues raised in Chap. 2, with Table 2.9 setting out Aramco's options for including downstream assets in an IPO listing. What transpired is that it would be easier for the company to list some or all of its wholly owned domestic assets given valuation complexities for international joint ventures. Some have estimated the value of these domestic refineries at \$10 billion on the basis of a production valuation of \$10,000 per daily barrel of 1 million b/p day capacity, but the valuation could be lower if the majority of sales is in the subsidized domestic market which are below international prices. According to analysts, Saudi Aramco's total wholly owned and joint venture refining assets might be valued at around \$40–\$45 billion, with local wholly owned refineries accounting for \$10 billion and with the joint venture share at around \$35 billion (Foreign Reports Inc. 2016). However, until Aramco decides which of these domestic and joint venture assets will be included in any IPO, it is difficult to estimate a precise figure, especially if international high-value assets like the US-based Motiva refinery will be included. In the final analysis, it is not the size or cost of these refining assets that count but rather the cash flow earnings of the assets. Given that Crown Prince Mohammed has made it clear that all options are now on the table to think “outside the box,” one pos-

sibility is not to include refining and other downstream assets in the preliminary IPO but to hive these and merge with SABIC’s domestic operations into a new petrochemical and refining company to ensure synergy and avoid duplication between the two. This can be followed with a partial listing of shares in the domestic market, where both Aramco and SABIC have experience in listing joint venture, and to eligible and qualified foreign investors given that the Kingdom is looking forward to having the local stock exchange being included in the prestigious Morgan Stanley Emerging Market Index.

Another potential alternative to an IPO, or for borrowing on the international capital markets, would be for the Saudi government to raise funds by selling part of the concession currently owned by Saudi Aramco directly to other international oil companies, and there are examples of this from other GCC oil producers, especially by Abu Dhabi. The experience of Abu Dhabi, where the emirate has successfully renewed its onshore concession and sold 40% of Abu Dhabi Company for Onshore Petroleum Operation’s (ADCO) concession to a group of European and Asian energy companies, which included France’s Total, the UK’s BP, InPex of Japan, South Korea’s GS Energy, and the China National Petroleum Corporation (CNPC), is an illustrative example (Graves 2017; MEES 2017b). According to reports, the CNPC was awarded an 8% stake for \$1.77 billion while BP’s 10% stake amounted to \$2.2 billion for the 40-year concession, with ADNOC, the national oil company, maintaining a 60% stake (McAuley 2016, 2017).

These types of concession sale agreements ensure that the IOCs are long-term technology partners to national oil companies as well as ensure that there are long-term markets for their oil exports. In other steps being planned, the Abu Dhabi National Oil Company (ADNOC) may sell minority stakes in some of its private units to international partners in the refining, petrochemical, and other areas such as pipelines and storage as well as listing on the local market some of its service-related companies, as ADNOC will not sell stakes in the company itself (Dipaola and Habboush 2017). ADNOC announced in July 2017 that it is planning an IPO of its 300 service station units and may seek a value of as much as between \$14 and 10 billion and raise up to \$3 billion from a listing (Nair et al. 2017). Whether the Saudi government will opt for this type of model of cooperation is something that has not yet been put forward as an alternative to the planned IPO, but the ADNOC initiatives seem to insulate the parent company from oil price related valuations.

Launching the IPO

Preparing for and launching a successful IPO on the international markets that meets with sophisticated investors’ needs for detailed information is an important element that requires input from many stakeholders involved in the process. In order to start the process, the company has to carry out its own internal SWOT analysis – strengths, weakness, opportunities, and threats – as this will be a key element in assessing the company to respond to concerns that might be raised. In an earlier

chapter, we have set out a SWOT analysis for Aramco in Table 3.4, but the list below assesses some of the key threat elements facing Saudi Aramco.

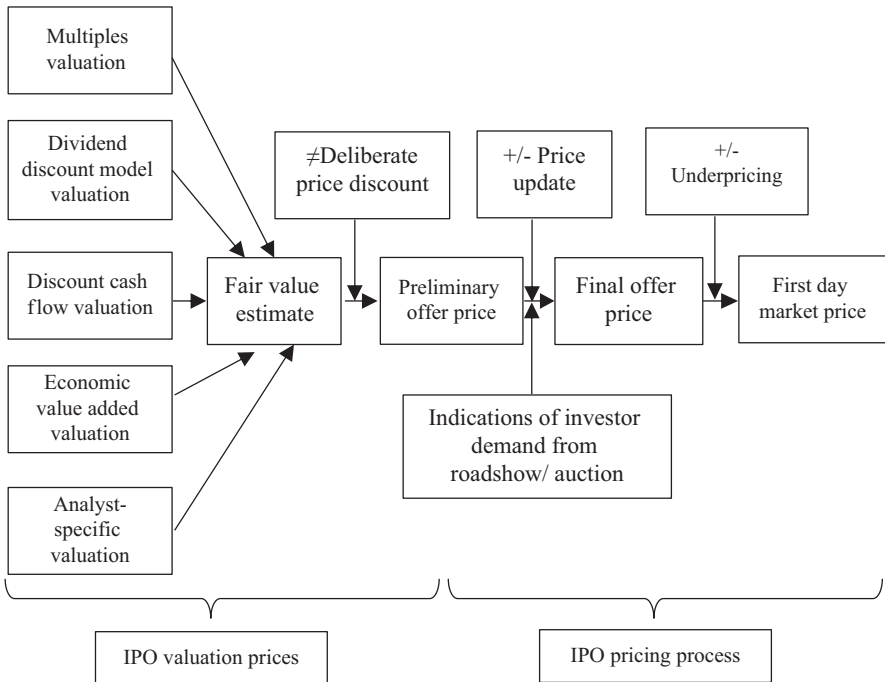
Threats

- *Climate change and fossil fuel disinvestment*
- *Susceptible to global economic fortunes*
- *Competition from large global non-OPEC players*
- *Loss of sovereign immunity*
- *Loss of government income*
- *Listing regulation and disclosures on reserves, minority rights, and anti-trust lawsuits*

The threats that Aramco faces remain the same whether the company is listed or not, except that a listing brings with it a range of external threats relating to loss of sovereign immunity and potential antitrust lawsuits. This can be partly mitigated if Aramco opts to list in an exchange that poses fewer risks in these areas.

Concerning the IPO process, this takes into account both a valuation and pricing process as illustrated in Fig. 5.19.

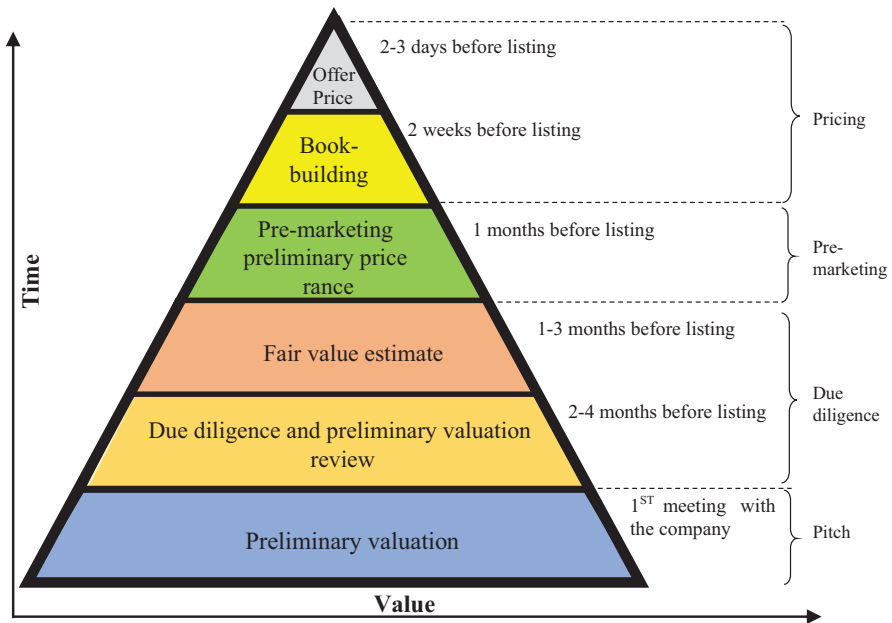
Fig. 5.19 IPO valuation and pricing process



Source: Roosenbloom (2012, p. 1656)

The IPO valuation process can follow different methods as noted earlier, including analyst specific valuation if none of the traditional valuation methods (dividend discount, discounted cash flow, economic value added, etc.), are deemed not applicable to the company due to limited financial data. Once this valuation process is finalized, the second stage, the IPO pricing process, takes place as noted in Table 5.14 starting with an initial first value estimation and then through a market demand assessment and trial and error, arriving to a final offer price and first-day market price. The valuation and pricing processes can take anywhere between 4 and 8 months as noted in Fig. 5.20.

Fig. 5.20 Average time phases required for IPO valuation and pricing processes



Source: Adapted from New York Stock Exchange (2013, pp. 103–105)

The process illustrated in Fig. 5.20 is not necessarily continuous, and although broken down into four stages, the process becomes progressively more defined due to successive updates until arriving at the offer price or the price at which the shares will be placed. The main phases of the process are:

- Valuation carried out during the “pitch” phase by advisory banks
- Valuation carried during the due diligence phase
- Premarketing and definition of the indicative price range
- Final pricing

As noted above, the process timeline can, on average and if the company is well advanced in its listing document, extend from 4–5 months to 8–9 months. Given

that the planned Aramco IPO is set for 2018, the earliest that the IPO can be completed is around May 2018 or September 2018 at the latest, again assuming that the company is well advanced in the preparation of the offering listing document followed by the investor prospectus. Once a listing exchange has been shortlisted, a listing document has to be submitted for approval by the exchange regulator, the content, and the depth of required information varying depending on individual regulators. In essence, such listing applications involve submitting the following documentation:

- *Executive summary*
- *Preliminary remarks*
- *Preference market (sector analysis, competition)*
- *Equity story (financial data, growth, profitability)*
- *Considerations on the valuation:*
 - *Market multiples used*
 - *DCF method used*
 - *Sensitivity analysis*
- *Conclusions*

The practice, a “Long-Form” listing application report is then submitted, which is summarized in Table 5.16, based on London Stock Exchange guidelines.

Table 5.16 IPO listing “Long-Form” report contents

Sector	Due diligence issues
• Business overview	<ul style="list-style-type: none"> • Markets and competition • Sales strategy, sales organization • Customers, contracts, and pricing • Size of market, growth potential • Regulatory, economic, or technological issues • Opportunities for expansion • Impact of related intercompany transactions and intended relationship post IPO
• Organizational structure, management, and personnel	<ul style="list-style-type: none"> • Ownership and board structure • Directors’ and Senior Executives’ biographies • Management committees • Suitability of current management structure • Staff shortages in key areas • Internal control
• Financial performance	<ul style="list-style-type: none"> • Balance sheets at each year/period and significant trends and “on balance” sheet exposures and financing arrangements • Cash flow performance and trends • Adjusted EBITDA • Historical trading performance by business segment • Reliance on key products/ geographies
• Accounting policies and basis of preparation	<ul style="list-style-type: none"> • Compliance of policies with GAAP/local law and differences between local country GAAP and IFRS • Alignment with industry practices and “best practice”

(continued)

Table 5.16 (continued)

Sector	Due diligence issues
<ul style="list-style-type: none"> • Information system 	<ul style="list-style-type: none"> • Significant information systems, applications, and hardware • Recovery and backup procedures • IT personnel/strategy • Controls over system development and data file access
<ul style="list-style-type: none"> • Overseas taxation and dividend policy 	<ul style="list-style-type: none"> • Impact of the IPO on current tax position • Compliance with local corporation tax • Details of the provisions for tax in the accounts • Proposed dividend policy
<ul style="list-style-type: none"> • Other information 	<ul style="list-style-type: none"> • Material litigation • Terms of the share offering and share capital • Principal risks of relevance to the company and an acquisition of its shares

Source: London Stock Exchange (2010, pp. 47–48)

Based on the “Long-Form” listing document, an investor prospectus is then prepared to launch the IPO bid process. It is important to highlight here the issue of principal risks facing the company whether internal or external, and how the company intends to mitigate these, especially for IT-related risks, a factor, and which now seems to become more prevalent given the spate of powerful cyber-attacks on key infrastructures. In June 2017, Rosneft suffered such a cyber-attack but insisted that production had not been hit due to a backup system in place, which ensured that production and extraction of oil is not stopped (Agence France-Presse 2017). Ensuring that Saudi Aramco is also well prepared for such an eventuality will be an important element of the IPO risk factor, given the geopolitical uncertainties of the Middle East region, with accusations that both private and state actors are involved in cyber-attacks.

Aramco and Post-IPO Realities

The appointment of Prince Mohammed bin Salman as Crown Prince Arab News (2017b) all but settled the issue on whether Aramco will be partly privatized or not, and the process will now be invigorated for a listing in 2018, despite doubts from an inquisitive and sometimes critical outside world. On the assumption that Aramco finalizes a successful IPO, questions then a rise over the role Saudi Arabia might play in the global energy markets and specifically, its continuing role in OPEC. Will Saudi Arabia continue to play the leading role as an OPEC member by being part of collective production agreements, to manage global oil supplies and affect price, or will it abandon its role of swing producer in the oil market and opt for a market-led production policy which was initiated in November 2014 but abandoned in 2016 after oil prices collapsed? Is the Kingdom destined to always assume its “destiny” as a swing producer, irrespective whether its NOC is partly privatized or not (Kemp

2017b)? In 2016, Saudi Arabia was forced back into this role, despite insisting since the mid-1980s, it would never assume the burden again.

The problem is that the role of swing producer is not one that Saudi Arabia voluntarily accepts but feels is thrust upon the Kingdom given its premier position in production and excess capacity, centralized in one national oil company, Saudi Aramco. Using its production output, the Kingdom can use the swing producer role in different ways, however, to balance supply and demand to keep prices close to an intended oil price target. The other method can be described as a “punitive” mode, whereby the Kingdom acts as a swing producer to try and regain lost market share it feels it has lost to others due to restraint in its own production capacity. In this punitive mode, Saudi Arabia opts for a higher production volume that floods the market and gains the Kingdom new market share but lowers prices as a means of disciplining others to comply once again with production quotas. During 2016, Saudi Arabia opted to adjusting production to achieve a desired price range, which is critical for the success of the Aramco IPO valuation, as analyzed under different price scenarios earlier in the chapter.

A key element in trying to support a relatively high but stable oil price level has been the surprise agreement with Russia to curtail production, given the reluctance of the Russians to join in earlier “freeze” production talks under former Saudi Oil Minister Ali Al Naimi during 2016. The Russians had insisted that OPEC members comply first among themselves to verifiable production levels and cuts before they, and other non-OPEC members, join in any agreements to stabilize oil prices. This took place in December 2016, and observers have noted the warm personal relationship established between Russian Energy Minister Alexander Novak and his Saudi counterpart Khalid Al Falih. Above all, the strong rapport between President Putin of Russia and Crown Prince Mohammed bin Salman is the cornerstone of this evolving Russian-Saudi energy cooperation, dubbed “the Axis of Love,” and possibly heralding a new oil order (Zhdannikov and Soldatkin 2017). Such a détente would have been unthinkable in the past given the geopolitical differences between the countries over issues like Syria, where they are on opposing sides. However, this unlikely partnership between Saudi Arabia and Russia has been born out of necessity for the two countries due to lower oil prices and the need for higher revenues by both, but for different reasons, with President Putin’s March 2018 elections requiring more federal funds and the planned Aramco IPO requiring a more stable and high oil price. The question is whether both countries will remain in partnership long after the March 2018 production cut agreement worked out between OPEC and non-OPEC expires and whether this new found energy strategic relationship heralds a framework principle for continued cooperation between the two blocks of producers.

The probability of this happening for a longer extended period beyond March 2018 is now more than likely, following on from the historic first visit by a Saudi monarch, King Salman bin Abdul-Aziz to Russia in October 2017, during which several bilateral agreements and strategic cooperations were signed including Saudi investments in Russian transport as well as in energy firms like Sibur in joint venture refining projects with Aramco, and a possible Saudi participation in an Arctic LNG project led by Novatek, as well as investment in Eurasia Drilling Company,

Russia's largest oil drilling contractor. It was the Russian- Saudi OPEC and Non OPEC production agreement however that captured centre stage, with Saudi Energy Minister Falih describing it as having "breathed life back into OPEC" and stabilised oil prices (Meyer et al. 2017; Soldatkin and Golubkova, 2017)

OPEC: One Foot In, One Foot Out?

Once an NOC becomes fully or partly privatized as noted in the analysis of the four NOCs, their relationship with shareholders changes. When fully government owned, they naturally cut supply when their government shareholder demands it for their own economic or geopolitical reasons. In the case of Rosneft and the other NOCs, they are now commercial entities, albeit with significant state shareholding, but are now also accountable to investors with shares traded in various exchanges, having to produce quarterly results, interim reports, business plans, and future strategies at shareholder general assembly meetings. Tensions between commercial and national interests will arise if the NOC feels that investor interests are being marginalized to meet government directives, as was the case with Rosneft's reluctant acceptance to production cuts, or more accurately, agreeing to a maintenance cycle production reduction (Denning 2017).

Once Aramco is listed, similar questions might arise from shareholders who will argue that their interests are being marginalized at the expense of state interest. The converse might also apply whereby the majority shareholder, the Saudi government, could use Aramco's commercial status, to argue *within OPEC* that it cannot comply with that organization's directives to members to follow an action that Saudi Arabia feels is harmful to its interests. Privatizing Aramco can then become double-edged sword for the Kingdom, raising questions on its membership of OPEC as a fully fledged member in the long term or whether it will opt, like Russia, to become an observer member nation that joins collective decisions when it feels it meets its short-term economic or political objectives but leaves it free to pursue commercial and market-led strategies when it deems necessary. Given the leading role that the Kingdom played, along with other fellow OPEC founding members, the probability that it would leave OPEC completely and become an observer member is somewhat remote in the short and medium term, but the privatization of Aramco is certain to raise many investor questions and possible antitrust litigation issues for the company, if investor and state interests do diverge significantly in the future. These types of difficult questions will be raised when the IPO investor "roadshow" takes place, especially in Western financial centers, unless the government opts for a more "friendly" stock exchange listing where sovereign wealth type of investors are more interested in acquiring a stake in Aramco for long-term geopolitical energy security and political relationships and with fewer questions being asked.

In conclusion, the planned IPO is a signal from the newly appointed Crown Prince that there are no "holy cows" in his economic reform program. The Prince has now acquired the full levers of economic, defense, and energy levers of state as he also chairs the Supreme Board of Aramco and heads the Public Investment Fund, the

other instrument for the economic, or more precisely, financial diversification of the Kingdom. Having someone overseeing the whole economy and political landscape can produce clarity of purpose, as well as bringing with it major responsibilities for final decision-making. Launching the Aramco IPO, in face of the many issues and obstacles that it will have to overcome as noted in the book, is a daunting task for anyone to take on, but Crown Prince Mohammed bin Salman is determined to take up the challenge and to succeed in his new vision for the company and the country, as the IPO of Saudi Aramco has been fundamentally linked to the rest of the transformation and reforms envisioned for the economy. The success of one will reinforce the other and vice versa should the expected positive outcomes not materialize. The stakes are high for both the country and the company with very little as a margin of error. According to media reports, Saudi Arabia is preparing for a possible delay in the Aramco IPO to 2019, as the planned 2018 timetable is deemed too tight and the IPO process is far more complicated than at first realized, although the company has restated that the IPO was still on track (Blas 2017a). For Aramco, the final company valuation should be realistic and based on hitherto nonpublic data to reduce political, economic, and operational risk premiums that might affect a final valuation and ensure its success at the right price. To remove some of these uncertainties, it has been reported that Aramco could reveal its audited accounts for the first time in early 2018 for the period 2015–2017 once the government had decided on a final venue for the listing, as different venues use different accounting standards such as U.S. GAAP or IFRS. These audited accounts would be shared first with a group of large investors and later incorporated in the full prospectus, with the 2017 accounts reflecting the new 50% taxation level while the 2015–2016 accounts will be done on a pro-forma basis (Argaam 2017m). Until that happens, a valuation of Saudi Aramco remains a highly subjective exercise.

Chapter 6

Conclusion and Recommendations

What you do today can improve all your tomorrows

Ralph Marston

Saudi Arabia's heir apparent and future King Mohammed bin Salman has made it abundantly clear that Saudi Aramco will play a central role in the economic transformation of the Kingdom. The Vision 2030 and the National Transformation Plan 2020 are strategic decisions to wean the Kingdom away from oil dependency and ensure that a more sustainable non-oil revenue base supports this transformation. Saudi Aramco's IPO, first announced during 2016, would assist the transformation, partly reversing the 1980 nationalization of Aramco by selling around 5% of the company to local and international investors. The objectives were clearly set out by Prince Mohammed: the flotation would transform Aramco into a global integrated energy company, increase its corporate governance, and use the proceeds of the IPO to invest in Saudi and international projects to generate non-oil revenue.

The Vision 2030 goals are set out in three key pillars, which underpin Aramco's role. These are, first, to maintain the status of Saudi Arabia as the heart of the Arab and Islamic worlds; second, support the Kingdom's determination to become a global investment powerhouse; and, third, to transform the Kingdom's unique strategic location into a global hub connecting three continents – Asia, Europe, and Africa. From these three pillars, the following objectives are derived:

- *Mineral resource exploitation would become a priority.*
- *Transforming Aramco from an oil-producing company into a global industrial conglomerate.*
- *Transforming the Public Investment Fund into the world's largest sovereign wealth fund.*
- *Encouraging major Saudi companies to expand into global markets.*
- *Localize local content.*
- *Provide better opportunities for partnerships with the private sector.*
- *Adopt wide-ranging transparency and accountability measures and reforms.*

The planned IPO touches upon all the above objectives whereby the newly empowered Ministry of Energy, Industry and Mineral Resources now oversees the

key pillars of the Saudi economy to ensure better coordination between the three sectors under the Minister, who is also the Chairman of Saudi Aramco. Not since Petromin's early vision to consolidate the above three sectors in the 1970s has Saudi Arabia taken such a fundamental step. The success of the planned Aramco IPO to raise substantial proceeds is key to transform the Public Investment Fund into the world's largest sovereign wealth fund. Saudi Aramco is set to pursue a viable local content and localization program that will open doors for Saudi companies to provide services and equipment, not only for Aramco but for other export markets. The IPO will also be a catalyst in Aramco's transparency and investor accountability.

The planned IPO reverses the early period of resource nationalism and the desire by producer countries to control their national oil companies and their production, instead of having this under the control of independent oil companies (IOCs). The history of Saudi Aramco though did not follow the traditional path of other NOCs, and the influence of the IOCs continued through a close relationship with Aramco and the presence of many expatriate managers working with Aramco. This embedded continuity in processes and gave rise to Aramco's unique corporate culture, which set it apart from other wholly, nationalized NOCs. The legacy ensured that those Saudi nationals who took over the most senior executive positions at Aramco had been groomed over many years and had rotated in both upstream and downstream operations as well as holding international assignment positions. This is important for the planned IPO of the company, as it requires a new outlook for Aramco whereby the partly privatized company will have a wider mandate in engineering services and refined product trading.

To carry out its new mandate, Aramco has been taking some significant steps in order to transform itself from an oil producer and exporter to become a significantly refined product player. The setting up of world-class petrochemical projects like SATORP and SADARA – the latter the largest complex in the world, costing \$20 billion and producing a wide range of specialty chemicals – is transforming Aramco. The company has also been active not only in carbon capture and storage and in its energy R&D programs in both upstream and downstream operations but also at the cutting edge in novel applications like the oil-to-chemicals initiative it is undertaking with SABIC and by itself.

An assessment of Aramco's SWOT analysis highlights some of the key issues the company faces to build upon its strengths and reduce some of its perceived weaknesses. Aramco's strengths include strong oil reserves as well as a significant production capacity reportedly taking this from 12.5 million bpd to the 15 million bpd if need be to support its global market position, especially in the Asian markets. Another strength is the growth in Saudi Aramco's refining assets and its focus on innovation, research, and development. The company's opportunities are an invigorated focus on local energy efficiency initiatives and investment and participation in an ambitious solar and renewable energy program and Aramco using this to expand the local supply contract chain, especially a higher local content in renewable energy and contracting services. The company's IKTVA or In-Kingdom Total Value Add program has set a high standard for the rest of the Kingdom in promoting a long-term and meaningful localization initiative in the manufacturing sector.

Aramco's weaknesses include a lack of worldwide retailing network for its refined products, as well as a concentration of oil reserves in the Kingdom which could be a potential risk due to geopolitical crisis in the region. Unlike some of the other partially privatized NOCs examined in the book like Sinopec and even Statoil, the Kingdom has not seen the need for expanding internationally to add to its current massive reserve base of around 266 billion barrels. Another potential weakness is that key Aramco personnel could become overstretched due to managing the multiple noncore mandates of the company. As for threats, Aramco's main ones are fluctuations in global oil prices, including natural gas and chemicals, as well as facing more stringent environmental regulations. Aramco is taking steps to mitigate these threats by focusing on specialty, high-value chemical products and carrying out advanced environment reduction policies through carbon capture and sequestration technology, with the Kingdom being the most advanced in this sector among OPEC producers. Establishing international refinery and petrochemical joint ventures in key growing Asian markets will assist Aramco to supply these markets using its own assets. The plan for Aramco to trade third party crude and refined products through its trading subsidiary will boost the company's bottom line profitability and place it on par with International Oil Companies.

The issue of reserve estimation and the actual amount of Saudi reserves is something that Aramco has to clarify in its IPO prospectus. This is to address the issue on whether the two appointed independent reserve auditors De Golyer and McNaughton and Gaffney, Cline, and associates will carry out their audits using a more vigorous US SEC regulation or according to the Society of Petroleum Engineers (SPE) definitions, especially if no detailed field-by-field reserve audit is made, as Aramco has already advised that the preliminary reserve audit data are in line with Aramco's own estimates. Another issue is the release of Aramco's first audited financials going back over several years and whether these will be presented in accordance with International Financial Reporting Standards (IFRS), especially US GAAP, if Aramco still decides to pursue a New York Stock Market listing. Prospective investors will also want to know more about Aramco's proposed dividend policy and whether this will be on an assured basis or would depend on the company's financial performance, as well as whether the reduced tax rate to 50% might also be liable to change in the future should the government decide to raise this due to changed fiscal fortunes. Will this be done in a separate side commitment by the Saudi government or implied in the offering prospectus?

The issue of subsidized energy to both individual consumers and corporate users and how the government addresses this will have an impact on Saudi Aramco, as the government has recognized that it cannot indefinitely provide energy products at differentiated and discounted prices to international export prices resulting in lost revenues. The Kingdom's fiscal balance 2020 program has estimated that energy subsidy benefits reached around SR 300 billion (\$80 billion) in 2015 with water and energy typically accounting for the vast majority. For Saudi Aramco's operating subsidiaries, until the full subsidy price reforms set in by 2020, the industrial sector, including the important refinery and petrochemical sectors, will have a window of opportunity to transform and become more energy efficient and globally competitive.

To this end, Aramco has been an active participant in various energy efficiency programs like the National Energy Efficiency Program and the Saudi Energy Efficiency Center in close coordination with leading Saudi research centers.

Saudi Aramco has been entrusted with a wide range of corporate social responsibility tasks with the aim of encouraging and fostering a Saudi knowledge-based society. These initiatives involve establishing incubators such as *Wa'ed* to develop local enterprises by offering non-collateralized loans or venture capital partnerships. Women's Business Parks also aimed to provide employment to Saudi female graduates along with international partners like General Electric and Tata, while initiatives like *Maharat* aim to develop young Saudis for specialized construction trades. In the medical sector, Aramco has established the Aramco-John Hopkins joint venture to set best practice not only for its own employees but to the wider Saudi health sector, as well as partnering with the Technical and Vocational Training Corporation and the Saudi Commission for Tourism and National Heritage to establish the National Training Center for Facilities and Hospitality Management with a target of reaching a training capacity of 5000 male and female trainees over the next few years.

On the knowledge-based frontier, Aramco has been a pioneer with its *iDiscover* Knowledge Incubator, *iThra* Youth, and *iSpark* helping youth and teachers in math and science teaching techniques and advanced technology. To ensure that the energy sector's workforce skills are also advanced, Aramco has established the Saudi Petroleum Services Polytechnic for the upstream sector and the National Industrial Training Institute for the downstream sector and has plans for establishing a National Power Academy, a High-Fund Construction Institute, as well as a National Civil Security Training Academy.

While the above are laudable corporate social responsibility activities, Aramco does not reveal the cost of undertaking such initiatives and how they are managed or overseen by current Aramco line managers or third-party contractors. It is Aramco's increasing focus on noncore engineering activities that have seen the company embark on significant projects to make it compete for the title of the Kingdom's "master builder," whether it is in building, overseeing, and staffing the Kingdom's first co-educational science-based King Abdullah University of Science and Technology (KAUST) or in managing mega-industrial projects like the joint venture with Hyundai and Lamprell to build the King Salman International Complex for Maritime Industries and Services in *Ras Al Khair* which will provide engineering, manufacturing, and repair facilities for rigs and vessels. Other megaprojects are the *Ras Al Khair* fabrication yard as well as developing and managing the industrial and energy city in Dammam to attract a wide variety of oil, petrochemical, automotive, medical, and renewable energy companies. These projects are expected to generate thousands of direct and indirect national jobs and have a significant impact on Saudi GDP. Besides being a "master builder," Aramco is also planning to create a financing system for Saudi Arabia's maritime industry, akin to the Export Credit Agency approach, that will provide investors and customers with competitive financing options for services, equipment purchased, or work performed at the King Salman Maritime Complex.

Corporate governance to ensure that it meets international listing standards will also be a high priority for Saudi Aramco. “Model” governance for a national oil company involves two levels, a corporate governance and public sector governance approach. Corporate governance involves relevant objectives, autonomy, independent Board Members, independent budgets, internal financial oversight and corporate planning, and the ability to fund out of company cash flow. Public sector governance includes relevant policy and clear roles, independent functions of the NOC, a ministry regulator, requirements for noncommercial activity reporting and measurement, and clear information on fiscal regime. The above can assist a partly privatized NOC in how to manage “two masters,” private investors, and the controlling government shareholder, with different objectives.

Irrespective of how the final valuation of Aramco turns out to be and what assumptions are made, the analysis of the company’s early history, its mandate over time, and the specific requirements for an international listing have ensured that the company needs to address several issues. The following are some recommendations that Aramco may consider to meet its forthcoming IPO launch:

- *Ensure employee buy-in and public acceptance of the IPO.* As discussed in the book, the history of Aramco, its place in Saudi society, and the development of both the country and the economy bestowed upon the company a unique status. Aramco needs to conduct employee “town hall” meetings to appraise all level of staff about progress of the IPO and what steps are being taken and to address concerns in a transparent manner in terms of employment, benefits, and management in a post-privatized company. Employee buy-in to the planned change reduces uncertainty and is critical for the company’s future success. In a wider context, Aramco needs to become more proactive and use its public relations and media Advisors and Consultants, like the recently hired PR Company Brunswick of the UK, to put out the message on why and how the Aramco IPO will be conducted, especially to the Saudi public, and welcome feedback, given the perception among some on the need to sell part of the national “crown jewel.”
- *Enhanced board governance and employee representation.* On a company governance level, Aramco should consider appointing employee board representatives, like Statoil and Petrobras. This will “democratize” the company’s governance structure and ensure that employees feel they have a say in the company’s performance and its future prosperity. The company can specify criteria for employee board selection and ensure that the appointed employees represent both downstream and upstream operations.
- *Gender board diversity.* Saudi Aramco should consider gender diversity for board membership, drawn from among its senior and talented pool of female employees as was noted in the book or from outside. This will bring Saudi Aramco into line with senior-level female appointments in Saudi banks and at the Capital Market Authority, as well as fulfilling one of the aims of Vision 2030 for female empowerment in the workforce and wider participation in society.
- *Removing government debt from Aramco balance sheet.* The company needs to disentangle itself from the government’s finances and debt that foreign

governments and other government agencies owe to Saudi Aramco, by removing such debt off Saudi Aramco's balance sheet to that of the Ministry of Finance and ensure that its audited accounts are "clean" before the IPO listing.

- *CSR activities' new participation model.* The company should consider hiving off its noncore activities into a new subsidiary with its own board and budget and management structure, especially for the corporate social responsibility elements outlined earlier. Alternatively, Aramco could make specific contributions to such CSR activities on the board's recommendations but that these activities are managed in a separate entity, either completely separate from Aramco or through a subsidiary that is not part of the IPO and run by qualified private sector entities.
- *Noncore engineering activities spin off.* Saudi Aramco's commercial oriented but noncore engineering projects could also be hived off into a separate Aramco subsidiary with its own profit-and-loss balance sheet, managed through a separate board of directors and dedicated management, with transactions between this subsidiary and Saudi Aramco carried out on a market pricing basis. This will incentivize the subsidiary to perform on a commercial basis, rather than as a cost center, making its management seek commercial opportunities not only in the Saudi market but also in the wider GCC and internationally. The planned maritime complex is an example whereby rigs can be manufactured for clients in other oil producer countries.
- *More independent board membership.* The number of independent Board Members needs to be increased, with the audit committee mostly composed of independent Board Members and chaired by an independent member.
- *Commercializing R&D initiatives.* Aramco's R&D and existing patents are a source of potential commercialization and revenue generation. A separate subsidiary should be considered for these activities with a focus on commercializing patents and either selling the IPR rights to the private sector, for a royalty fee whether to Saudi or international investors, or through a venture capital joint venture with Aramco's venture capital subsidiary. Advanced R&D processes in the energy sector and carbon capture and storage applications can be sold to other oil producers who want to maximize oil field production and at the same time reduce fossil fuel carbon emission.
- *Independent budgetary control.* Saudi Aramco's budgetary needs should be clearly ring fenced from its operating cash revenues, and the board should resist pressure from the majority shareholder to adjust the company's annual budget requirements due to the state's fiscal needs.
- *Selling part of refining and petrochemical assets.* Until it is clarified which of the company's operating refining and petrochemical assets will be included in any privatization process, whether these are wholly owned, joint venture, domestic, or international, Saudi Aramco could consider the partial flotation of some of these assets on the domestic or international markets. These could involve wholly owned assets or those with international joint ventures like SADARA to bring the equity ownership of Aramco and the foreign partner to an equal ownership basis. These types of partial asset sales are ones that Abu Dhabi National Oil

Company (ADNOC) is considering for its service units and even for its onshore concession sale to foreign energy partners.

- *Creating a new Aramco-SABIC petrochemical joint venture.* In lieu of partial or full privatization of some or all of Saudi Aramco's refining assets, consider the creation of an Aramco-SABIC joint venture for their domestic downstream assets as a first step to generate synergy in international acquisition opportunities, enhance market penetration, induce a more equitable sharing of Saudi gas feedstock and lead to a partial listing of shares of this new entity on the local exchange to Saudi citizens and qualified foreign investors, and, at a later stage, cross listing in selected international stock markets.
- *Alternative sources of capital raising.* The merits of the IPO as a source of finance for the Vision 2030, and empowering the Public Investment Fund with the proceeds, should be critically assessed against other alternatives such as raising international capital and debt, which could be cost-effective and meet the same financial diversification investment objective of the Vision 2030 plan.
- *Choosing the right listing location.* A final listing location choice for Saudi Aramco, whether it is in one or more international locations besides the local stock market, should be approached with caution, especially in jurisdictions that grant investors more extensive litigation rights against the company. In this case, how Aramco operates post-IPO in meeting all investor interests rather than being part of restrictive antitrust production agreements or price setting will become important factors in deciding whether to list in one jurisdiction over another.
- *Index linking the government's 20% royalty payments to changes in international oil price trigger points.* One of the criticisms raised against the planned IPO is that the state has given up on a significant revenue cut in taxes from 85% to 50% while keeping the royalty rate at 20%. One possibility to ensure future higher government revenues is for the Kingdom to link an upward rise in the 20% royalty payment to higher international oil prices as an index link, whereby the state can raise the level of the royalty based on a pre-agreed formula of oil price increases over a period of time. The agreed-upon base change period (e.g., every 6 month's review), and an oil price rise (e.g., \$10 thresholds), has to be of a significant nature and with likelihood of a more permanent nature to trigger the upward revision (e.g., staggered at 2% levels), to avoid a downward revision in royalty to the 20% floor. This type of investment banking "bonus performance formula" is generally accepted by investors.
- *List Aramco in the Saudi Tadawul Exchange only as a first step.* Given some outstanding issues that need to be clarified for the IPO to be listed in a dual venue besides the Saudi Tadawul Stock Exchange, one option is to list the whole IPO on the Saudi Exchange as a first step before considering further incremental listings internationally. The current Saudi market capitalisation is around U.S \$440 billion and it has been argued that the local stock exchange does not have the depth to absorb such a large listing as the Aramco IPO, and that this could destabilise existing stock holding as investors sell out to invest in the Aramco offering. The counter argument is that the Capital Market Authorities have been

introducing significant reforms to allow foreign qualified institutional investors to enter the Saudi stock market. This can be accelerated to allow for more participation by foreign investors to enable capital inflows. Foreign institutional investors are long term investors, as opposed to the short term investment volatility exhibited by individual Saudi investors, and foreign institutional investors have demonstrated counter cyclical investment strategies in their Saudi equity portfolios that have balanced such volatility. A domestic listing will allow Aramco to implement any needed structural and pricing changes, especially in subsidies to its downstream operating units, and to release appropriate audited financials which will help with future incremental IPO listings in international venues. The prospective inclusion of Saudi Arabia to the Russell FT Emerging Market Index in 2018, and the MSCI Emerging Market Index at a later date should also ensure that a local Tadawul Aramco IPO listing attracts significant passive capital inflows, but more importantly, ensures that any future international listing will be well received given that Aramco will have established a positive track record in dividend payments and cash flow from operations.

Some of the above recommendations can be initiated more quickly than others, especially the recommendation for an Aramco-SABIC joint venture, which would bring into full circle the hopes and ambition of the Saudi government when it created Petromin to become a truly local and international player. The Aramco IPO requires the same level of internal transformation and reforms like the ones taking place or being planned for the wider economy where nothing is being taken for granted by the reformist Crown Prince and heir to the throne, through bold steps rather than incremental measures, and where nothing is held sacred and untouchable. The two the Aramco IPO and the total transformation of the Saudi economy are interlinked if both are to succeed. One will not succeed without the other. Without doubt and given the many tasks to prepare the company for its partial privatization, the risks are inherent in carrying out the IPO but so are the rewards which can improve the Kingdom's fortunes and its future strategic economic orientation.

References

- Abdul Ghaffour, P. (2005) "Petromin to be merged with Saudi Aramco". *Arab News*. Jeddah. 25 Oct. 2005.
- Abrams, K. C., Martin M., Dick, T. and Tom, F. (1981) "*The story of the American Oil Industry: Brine to Bonanza*". The Woodlands, TX: Pioneer Publication Inc.
- Afanasieva, D. and Denina, C. (2017) "Britain seeks looser IPO rules to lure Saudi Aramco, worries investors". *Reuters*, 13 Jul. 2017.
- Afanasieva, D. and Price, M. (2017) "Exclusive: London tries to lure Saudi Aramco with new listing structures – sources". *Reuters*, London. 4 May 2017.
- Agence France-Presse. (2017) "Russian oil giant Rosneft hit by 'powerful' cyber-attack". *Agence France-Presse*. 27 June 2017.
- Aharoni, Y. (1986) "*The Evolution and Management of State Owned Enterprises*". Cambridge, MA: Ballinger Publishing.
- Aizhu, C. (2017) "China's Norinco and Saudi Aramco line up \$ 10 billion refinery plan". *Reuters*. 17 May 2017.
- Al Arabiya. (2017) "Deputy Crown Prince Interview". *Al Arabiya TV*. 3 Apr. 2017.
- Al Arabiya News. (2016) "Interview of HRH Prince Mohammed bin Salman with Turki Al Dakhil". *Al Arabiya News*. 26 Apr. 2016.
- Al Meshari, A. (2011) "Carbon capture and storage: value creation or cost?" *KAPSARC*, Riyadh. Energy Dialogue at KAPSARC, 20–22 Nov. 2011.
- Al Moneef, M. (1988) "*International Downstream Integration of National Oil Companies*" in Strategic Positioning in the oil industry, ed. P Steven's, pp. 45–60. Abu Dhabi, Emirates Centre for Strategic Studies and Research, I.B Tauris.
- Al-Naimi, A. (2016) "*Out of the Desert: My journey from nomadic Bedouin to the Heart of Global Oil*". London: Portfolio Penguin.
- Al Rajhi Capital. (2017) "Saudi Aramco IPO: To Boost Transparency and Efficiency". *Strategic Report*. Al Rajhi Capital, Riyadh. April 2017.
- Al Riyadh Newspaper. (2017) "Saudi Government Subsidies 'directly linked' to Energy Prices: Al Jadaan" Riyadh. 3 Feb. 2017.
- Al Yami, N. (2015) "Creating Value in the Kingdom" *IKTVA Launch*. 1st Dec. 2015. Dhahran. <https://www.iktva.sa/downwards>.
- Al-AbdulKarim, A. (2015) "Supply Chain Opportunities Oil and Gas". *IKTVA Launch*. 1st. Dec. 2015. Dhahran. <https://www.iktva.sa/downwards>.
- Al-Kasim, F. (2006) "*Managing Petroleum Resources: The Norwegian Model in a Broad Perspective*". Oxford: Oxford Institute for Energy Studies.
- Almana, M. (1982) "*Arabia Unified: A portrait of Ibn Saud*". London: Hutchinson Benham.

- Almashabi, D. (2016) "Saudi Aramco, Sabc looking at joint U.S. Shale gas investment". *Bloomberg*. 19 Apr. 2016.
- Alon, I. and McIntyre, J.R. (2008) "*Globalization of Chinese Enterprises*". Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.
- Anderson, Irvine. (1981) "*Aramco, the United States, and Saudi Arabia; A Study of the Dynamics of Foreign Oil Policy, 1933-1950*". Princeton Legacy Library. 21 July.
- Arab News. (2016a) "UN Expert to Visit KSA to Study Efforts to Fight Poverty". *Arab News*, Jeddah. 31 Dec. 2016.
- Arab News. (2016b) "Kingdom Issues Clarification on Energy Price Increases". *Arab News*, Jeddah. 30 Dec. 2016.
- Arab News. (2016c) "Sabic and Saudi Aramco agree to study oil-to-chemicals project". *Arab News*, Jeddah. 28 Jun. 2016.
- Arab News. (2017a) "Saudi Efficiency Reviews up to SR 17 bn of Cost Savings". *Arab New*. 22 Apr. 2017.
- Arab News. (2017b) "Mohammed bin Salman named Crown Prince – SPA". *Arab News*, Jeddah. 21 Jun. 2017.
- Arab News. (2017c) "Saudi Aramco set to sign China's Yunan refinery deal". *Arab News*. Jeddah, 24 Aug. 2017.
- Argaam. (2017a) "Kuwaiti Parliament Revokes Decision to Hike Fuel, Energy Prices". 19 Feb. 2017. www.argaam.com
- Argaam. (2017b) "Saudi Arabia Shortlists firms for Solar, Wind Power Projects". 11 Apr. 2017. www.argaam.com
- Argaam. (2017c) "Bechtel Bags Contract for Saudi Project Management Role". 20 Feb. 2017. www.argaam.com
- Argaam. (2017d) "Independent audit said to confirm Saudi Aramco's oil reserves". www.argaam.com. 28 Jan. 2017.
- Argaam. (2017e) "Hong Kong bourse vies to win part of Aramco listing". *Argaam*. 28 Feb. 2017.
- Argaam. (2017f) "Singapore said to plan incentives to lure Aramco listing". *Argaam*. 6 Feb. 2017.
- Argaam. (2017g) "Saudi Aramco may seek cross-listing in several exchanges: Al Falih". *Argaam*. 2 Feb. 2017.
- Argaam. (2017h) "Saudi Aramco said to mull discounted shares for citizens". *Argaam*. 22 Feb. 2017.
- Argaam. (2017i) "Saudi Aramco to cut stake in Sadara via IPO, says Al Labbban". *Argaam*. 3 May 2017.
- Argaam. (2017j) "Saudi Arabia lowers income tax rate for Aramco ahead of IPO". *Argaam*. 27 Mar. 2017.
- Argaam. (2017k) "Saudi Aramco signs MOU's with China's Norinco, Aerosum". *Argaam*, 20 Mar. 2017.
- Argaam. (2017l) "Saudi Arabia shortlists firms for solar, wind power projects". *Argaam*, 11 Apr. 2017.
- Argaam. (2017m) "Dow plans to increase stake in Sadara JV with Saudi Aramco". *Argaam*, 29 Aug. 2017.
- Argaam (2017n). "Aramco said to have asked FTI to suspend advisory work on IPO". *Argaam*, 17 Oct. 2017.
- Arnold, T., Barbuscia, D. and Al Sayegh, H. (2017) "Saudi Aramco picks SAMBA Capital as local IPO advisor – sources". *Reuters*, London. 23 Mar. 2017.
- Arocena, P. and Oliveros, D. (2012) "The Efficiency of State-owned and Privatized Firms: Does Ownership make a Difference?". *International Journal of Production Economics*, 140: pp. 457–465.
- Astakhova, O. and Aizhu, C. (2017) "China invests \$9.1 billion in Rosneft as Glencore, Qatar cut stakes." *Reuters*, London. 8 Sept. 2017.
- Asthana, A and Taylor M. (2017) "Britain to ban sale of all diesel and petrol cars and vans from 2040". *The Guardian*. London, 25 July 2017.

- Associated Press. (2017) "Sept. 11 Families Sue Saudi Arabia over 9/11 Attacks". *Associate Press*, New York. 21 Mar. 2017.
- Atalla, T., Gasin, A. and Hunt, L. (2017) "Gasoline Demand, Pricing Policy and Social Welfare in Saudi Arabia". *KAPSARC*, Riyadh. Mar. 2015.
- Azhar, S., Al Sayegh, H and Barbaglia, B. (2017) "Exclusive: Saudi Aramco advisors favor London for historic IPO- sources". *Reuters*. London 27 July 2017.
- Baddock, E., Lang, P. and Srivastava, V. (2016) "Size of the Public Sector Government wage bill and employment". *World Bank*, Washington, Data Set. 17 Feb. 2016.
- Baster, L. Efid, B. and Wise, B. (2015) "Reforming the Role of State-owned Enterprises in China's Energy Sector: An Analysis of Collective Decision Making Processes Using the KAPSARC Toolkit for Behavioral Analysis". *KAPSARC*, Riyadh. July 2015.
- BBC. (2017). "Anger as German ex-Chancellor Schroeder heads up Rosneft Board". *BBC*, London, 29 Sept. 2017.
- Beirman, S. (2017) "Billionaires, Spies, Oil men: meet the board of a Russian Gant". *Bloomberg*, London. 21 Jun 2017.
- Bell, R., Filatotchev, I. and Aguilera, R. (2014) "Corporate Governance and Investors' Perceptions of Foreign IPO Value: An Institutional Perspective". *Academy of Management Journal*, Vol. 57, No. 1, pp. 301–320.
- Bian, M. L. (2005) "*The Making of the State Enterprise System in Modern China: The Dynamics of Institutional Change*". Cambridge, MA: Harvard University Press.
- Black, J. and Boat, K. (1994) "Strategic Resources: Traits, configurations, and paths to sustainable competitive advantage". *Strategic Management Journal*, Vol. 15, pp. 131–148.
- Blas, J. (2017a) "Inside Saudi Arabia's Big Bet on Plastics". *Bloomberg Businessweek*. 2nd July 2017.
- Blas, J. and Mahdi, W. (2016) "In Saudi Aramco IPO, Global refining empire may become the prize". *Bloomberg*. 28 Jan. 2017
- Blas, J. and Mahdi, W. (2017) "Saudi Arabia's \$ 2 trillion Aramco Vision runs into market reality". *Bloomberg*. 23 Feb. 2017.
- Bloomberg. (2017) "Saudi Arabia's Full Statement to Bloomberg on its 2017 Agenda". *Bloomberg*, London. 6 Mar. 2017.
- Boslego, R. (2017a) "Why the Aramco IPO is Doubtful". <https://seekingalpha.com/article/4047600>. 20 Feb. 2017.
- Boslego, R. (2017b) "Debunking the 'Aramco IPO Valuation' Argument for Higher Oil Prices". <https://seekingalpha.com/article/4047600>. 26 Feb. 2017
- Bouso, R. (2017) "Aramco Splits IPO advisory roles, appoints Brunswick". *Reuters*, London. 5 May 2017.
- BP. (2016) "Statistical Review of World Energy". *BP*, <https://www.bp.com>.
- Braga, B. (2017) "Petrobras unveils investment plans for biggest Onshore field". *E & P*. 21 June 2012.
- Cardoso, Fernando Henrique. (2001) "Democracy as a Starting Point". *Journal of Democracy*, Vol. 12, No. 1, pp. 5–14.
- Carey, G. and Nereim, V. (2017) "Saudi Arabia's Full Statement to Bloomberg on its 2017 Agenda". *Bloomberg*, London. 6 Mar. 2017.
- Carroll, J. (2017) "Oil sands batter major explorers' reserves as rout sinks value". *Bloomberg*, London. 23 Feb. 2017.
- Carroll, J. and Katz, A. (2017) "U.S. Treasury won't give Exxon a Waiver for Russian Drilling". *Bloomberg*, London. 21 Apr. 2018.
- Cheney, M. S. (1958) "*Big oil man from Arabia*". New York: Balantine Books.
- Chrisafis, A. and Vaughan, A. (2017) "France to ban sales of petrol and diesel cars by 2040". *The Guardian*, London. 6 Jul. 2017.
- Claes, D. H. (2002) "Statoil - between Nationalization, Globalization and Europeanisation". *ARENA Working Paper 02134*. Oslo, University of Oslo.

- Clark, P. and Raval, A. (2016) "Saudi Arabia set to reveal depth of oil reserves: Khalid Al-Falih says IPO of \$ 2 tn. Saudi Aramco to be 'most transparent' of all times". *Financial Times*, London. 17 Nov. 2016.
- Couto, V., Karisson, P. and Neilson, G. (1999) "Putting Headquarters in its Place: A Lean, Global Corporate Core". *Booz & Company*, London.
- Crilly, R. (2017) "Donald Trump pulls U.S. out of Paris climate accord to 'put American workers first'". *The Telegraph*, London. 2 Jun. 2017.
- Cuervo-Cazurra, A., Inkpen, A., Musacchio, A. and Ramaswamy, K. (2014) "Governments and Owners: State-owned Multinational Companies". *Introduction to Special Issues of Journal of International Business Studies on State owned Multinational Companies*. 9 Jul. 2014.
- Dajani, M.S. and M.S. David (1985) "*Economic Diplomacy: Embargo leverage and world politics*". Boulder, CO: Westview Press.
- Dann, U. (1988) "*The great powers in the Middle East 1919-1939*". New York: Holmes & Meier.
- Defterios, J. (2017) "The King of Saudi Arabia's Asia tour". *Arab News*, Jeddah. 8 Mar. 2017.
- Denning, L. (2017) "Russia's oil majors and the problem with privatizing OPEC". *Bloomberg*. 20 May 2017.
- Dharwadkar, R., George, G. and Brandes, P. (2000) "Privatization in emerging economies: An agency theory perspective". *Academy of Management Review*, Vol. 25, pp. 650–669.
- Dipaola, A. (2017) "Aramco plans to buy non- Saudi crude in Global Trading expansion". *Bloomberg*, London, 18 Sep. 2017.
- Dipaola, A. and Habboush, M. (2017) "Abu Dhabi's oil producer may sell shares in units to expand". *Bloomberg*. 10 Jul. 2017.
- Donnellan, A. (2007) "City threat to Saudis \$ 2 trillion oil float". *Financial Times*, London. 4 Jun. 2016.
- Downs, E. and Meidan, M. (2011) "Business and Politics in China". *China Security Issue*. No. 19, pp. 3–21. 8 February.
- Dummett, B., Said, S. and Farrell, M. (2017) "Saudi Aramco IPO plans slowed over where to list". *The Wall Street Journal*. 14 Jun. 2017.
- Eaton, C. (2017) "Worries shift from oil glut to oil shortages". *Houston Chronicle*, Houston, USA. 7 Mar. 2017.
- Edens, D. G. (1979) "*Oil and development in the Middle East*". Westport, CT: Praeger Publishers.
- Ernst & Young. (2009) "IPO insights: comparing global stock exchanges". *Ernst & Young*, London. 2009.
- Facey, W., Paul, L., Michael, M.M. and Thomas A. P. (2006) "*A land transformed: The Arabian Peninsula, Saudi Arabia, and Saudi Aramco*". Ed. Arthur P. Clark and Mohammad A. Tahlawi. Dhahran, Saudi Aramco.
- Farchy, J. and Hume, N. (2016) "Glencore and Qatar take 19.5% Stake in Rosneft". *Financial Times*, London. 10 Dec. 2016.
- Fattouh, B. and Harris, L. (2017) "The IPO of Saudi Arabia: Some Fundamental Questions". *The Oxford Institute for Energy Studies*, No. 9, Oxford. Mar. 2017.
- Field, M. (1985) "*The Merchants: The big business families of Saudi Arabia and the Gulf States*". Woodstock, NY: The Overlook Press.
- Filatotchev, I. and Aguilera, R. (2014) "Corporate governance and investors' perceptions of foreign IPO value: An institutional perspective". *Academic of Management Journal*, Vol. 57, No. 1, pp. 301–330.
- Financial Conduct Authority. (2017) "FCA proposes new premium listing category for sovereign-controlled companies". *FCA, London*. Press release. 13 Jul. 2017.
- Financial Times. (2010) "Petrobras Offering Raises \$ 70 billion". *Sao Paulo*. 24 Sept. 2010.
- Foreign Reports Inc. (2016) "Saudi Aramco's value". *Washington, D.C. Bulletin*, 20 Apr. 2016.
- Foy, H. (2017) "Russia demands big dividend payouts from state-owned companies". *Financial Times*, London. 28 Apr. 2017.
- Francisko, E. (2013) "Petroleum Politics: China and its National Oil Companies". *Europe Institute*. 26 June 2013.

- Gapper, J. (2017) "Do not bend the IPO rules for Saudi Aramco". *Financial Times*. 7 Jun. 2017.
- Ghanem, S. (1986) "*OPEC: The rise and fall of an exclusive club*". London: KPI Ltd..
- Ghazal, S. (2011) "*The Merger of the Two Giants: Saudi Aramco and SAMAREC*". LULU.com
- Ghosh, A. (1983) "*OPEC, the Petroleum Industry and United States Energy Policy*". Westport, CT: Quorum Books.
- Goldsmith, C. (2017) "Saudi Aramco is set to pay Shell \$ 2.2 bn to finalize the breakup of a U.S. joint venture". *City A.M.* 7 Mar. 2017.
- Golubkova, K., Zhannikov, D. and Jewkes, S. (2017) "How Russia sold its Oil Jewel without saying who bought it". *Reuters*. 20 Jan. 2017.
- Graves, LeAnne. (2017) "Adnoc awards China's CNPC 8 per cent of ADCO concession". *The National*, Abu Dhabi, 19 Feb. 2017.
- Gross, S. (2017) "The Saudi Aramco IPO is a game-changer for the Saudi economy". *MARKAZ*, 6 Jun. 2017.
- Hamilton, C. W. (1962) "*Americans and Oil in the Middle East*". Houston Gulf Publishing.
- Hapgood, D. (2000) "*Charles R. Crane: The Man who bet on people*". Hanover, NH: Institute of Current World Affairs.
- Hassard, J., Sheehan, J., Zhou, M., Terpstra-Tong, J. and Morris, J. (2007) "*China's State Enterprise Reform: From Marx to the Market*". London: Routledge.
- Heath, J. (1997) "Privatization in perspective" in A. Bennet (Ed.), *How does privatization work*. London: Routledge. pp 23–32.
- Henderson, J. (2012) "Rosneft-On the Road to Global NOC Status?" *The Oxford Institute for Energy Studies*, Oxford. January, 2012.
- Hertog, S. (2008) "Petromin: The slow death of statist oil development in Saudi Arabia". *Business History*. 50(5). pp. 645–667.
- Hertog, S. (2013) "Saudi Aramco as a National Development Agent: Recent Shifts". *NOREF – Norwegian Peacebuilding Resource Centre*, Policy Brief, August 2013.
- Hertog, S. (2016) "The One Thing in Saudi Arabia that works well is under threat". *Reuters*, London. 3 Feb. 2016.
- Hirtenstein, A. (2017) "Saudi Aramco's Green Energy Push Seen Widening Appeal of IPO". *Bloomberg*, London. 6 Mar. 2017.
- Hodge, G.A. (2000) "*Privatization: An international review of performance*". Boulder, CO: Westview Press.
- Hong Kong Stock Exchange. <http://www.hkex.com.hk>
- Houser, T. (2008) "The Roots of Chinese Oil Investments Abroad". *Asia Policy Paper* No. 5. pp. 141–166.
- Ignatius, D. (2017) "A Young Prince is Reimagining Saudi Arabia. Can he make his Vision come True?". *Washington Post*. 20 Apr. 2017.
- IMF. (2014) "Subsidy Reform in the Middle East and North Africa: Recent Progress and Challenges Ahead". *IMF*, Washington.
- Intertax. (2017). <http://www.intertax.ru/>. 24 Apr. 2017.
- Jadwa Investment. (2016a) "Saudi Vision 2030". *Jadwa*, Riyadh. May 2016.
- Jadwa Investment. (2016b) "NTP 2020: The Kingdom's Path to Sustainable Economic Development". *Jadwa Investment*, Riyadh. June 2016.
- Jadwa Investment. (2016c) "National Gas and Vision 2030". *Jadwa Investment*, Riyadh. Oct. 2016.
- Jadwa Investment. (2017a) "Quarterly Oil Market Update". *Jadwa Investment*, Riyadh. Feb. 2017.
- Jadwa Investment. (2017b) "Macroeconomic update". *Jadwa Investment*, Riyadh, Jun. 2017.
- Jadwa Investment. (2017c) "Petrochemicals and the Vision 2030". *Jadwa Investments*. Feb. 2017.
- Jessop, S. (2017) "British investors' wary of Aramco as London courts listing". *Reuters*, London. 10 May 2017.
- JP Morgan Cazenove. (2017) "Europe Equity Research 28 March 2017". London.
- Jungers, Frank. (2013) "*The Caravan Goes on: How Aramco and Saudi Arabia Grew Up Together*". Medina Publishing.
- KAPSARC. (2017) "Energy Dialogue 2016 Summary". *KAPSARC*, Riyadh. Mar. 2015.

- Keitz, A. (2017) "Saudi Aramco's IPO Financial Advisors have deep ties to Kingdom, Industry". *The Street*, New York. 31 Mar. 2017.
- Kemp, J. (2017a) "Saudi Arabia's Oil Reserves: How big are They Really?" *Reuters*, London. 11 Jul. 2016.
- Kemp, J. (2017b) "Saudi Arabia cannot escape destiny as swing producer" *Reuters*, 01 Feb. 2017.
- Kerr, S. (2017) "Sleepy Saudi Sovereign Wealth Fund Stirs and Shakes Global Finance". *Financial Times*, London. 27 Jan. 2017.
- Kerr, S. and Al Omran, A. (2017) "Saudi Aramco IPO Sparks fears of loss of 'Cash Cow'". *Financial Times*, London. 10 May 2017.
- Kibe, H. (2017) "Toyota to sign off on feasibility study for Saudi plant". *Nikkei Asian Review*, Tokyo. 11 Mar. 2017.
- Kim, K.I. and Yelkina, A. (2003) "Privatization in Russia: its Past, Present, and Future". *SAM Advanced Management Journal*, Vol. 68, pp. 14, 21.
- Kingdom of Saudi Arabia. (2016) "Global Medium Term Note Program". *Prospectus*, Ministry of Finance, Riyadh. Dated 10 Oct. 2016.
- Kingstone, Peter R. (1999) "*Crafting Coalitions for Reform: Business Preferences, Political Institutions, and Neoliberal Reform in Brazil*". University Park, PA: Pennsylvania.
- Kombargi, R., Karisson, P., Sastry, A. and Mathieu, N. (2011) "Governance in the GCC Hydrocarbon Sector: The Right Time to Act". *Booz&Company*, London.
- Kong, B. (2010) "*China's International Petroleum Policy*". Santa Barbara, CA: Praeger Security International.
- La Fon, H. (2017) "Should value investors buy IPO of world's most valuable company, Saudi Aramco?" *Guru Focus*. www.gurufocus.com/news/384349
- La Porta, R., de Silanes, F. and Shleifer, A. (2008) "The Economic consequences of legal origins". *Journal of Economic Literature*, Vol. 62, No. 2, pp. 285–332.
- Lacey, R. (1981) "*The Kingdom*". New York: Harcourt Brace Jovanovich.
- Lane, D. and Seifulmulukov, I. (1999) "Structure and Ownership" in D. Lane. *The Political Economy of Russian Oil* (15–45). Oxford: Rowman & Littlefield.
- Latiff, R. (2017) "Saudi Aramco to invest \$ 7 billion in Petronas RAPID oil refinery". *Reuters*. 28 Feb. 2017
- Lawson, C. (1994) "The Theory of state-owned Enterprises in Market Economies". *Journal of Economic Surveys*, Vol. 8, pp. 284–309.
- Leach, A., Livsey, A., Bernard, S. and Pearson, T. (2017) "IPO calculator: how much will Saudi Aramco be worth?" *Financial Times*, London. 4 Apr. 2017.
- Lebkicher, R., George, R. and Max, S. (1952) "*The Arabia of Ibn Saud*". New York: Russell F. Moore Co.
- Leblein, M. J. (2003) "The Choice of Organizational Governance form and Performance: Predictions from- transaction cost, resource-based, and real Options Theories". *Journal of Management*, No. 29, pp. 937–961.
- Lee, John. (2012) "China's Geostrategic Search for Oil". *The Washington Quarterly* No. 35:3, pp. 75–92. Center for Strategic and International Studies.
- Lester, L., Efirid, B. and Wise, B. (2015) "Reforming the Role of State Owned Enterprises in China's Energy Sector: An Analysis of Collective Decision Making Processes Using the KAPSARC Toolkit for Behavioral Analysis". *KAPSARC*, Riyadh. July 2015.
- Lewis, S. (2004a) "*Critical Issues in Brazil's Energy Sector – Deregulating and Privatizing Brazil's Oil and Gas Sector*". The James A. Baker III Institute for Public Policy. Rice University, USA. Mar. 2004.
- Lewis, S. (2004b) "Privatization and Decentralization in China's Oil Industry". *Institute for Public Policy*. Rice University, USA. 30 June 2014.
- Lex. (2017) "Aramco: King Kong: Ping Pong". The Lex Column, *Financial Times*, London, 6 Jun. 2017.
- Lipman, F. D. (2006) "*Corporate Governance Best Practice*". New Jersey: Wiley & Sons.

- Liu, H., Tellez, B., Atallah, T. and Barghouty, M. (2012) "The role of CO₂ capture and storage in Saudi Arabia's energy future". *International Journal of Greenhouse Gas Control*, Vol. 11, pp. 163–171.
- Livsey, A. (2017) "Lex in depth: the \$ 2 trillion Saudi Aramco question". *Financial Times*, 3 Apr. 2017.
- London Stock Exchange. (2010) "A guide to listing on the London Stock Exchange". *London Stock Exchange and White Page Ltd.*, London. Nov. 2010.
- London Stock Exchange. <http://www.londonstockexchange.com>
- Longrigg, S. H. (1954) "*Oil in the Middle East: Its discovery and development*". London: Oxford University Press.
- Maaden. (2016) www.maaden.com.sa/leadership.
- Mahdi, W. (2017a) "Saudi Aramco Said to Make Leadership Changes Ahead of IPO". *Bloomberg*, London. 16 May 2017.
- Mahdi, W. (2017b) "Aramco to spend \$ 300 billion as CEO frets about world oil supply". *Bloomberg*. 10 Jul. 2017.
- Mahdi, W. and Nereim, V. (2017) "Saudis seek 30 Solar, Wind Projects in \$50 billion Pledge". *Bloomberg*, London. 17 Apr. 2017.
- Mainwaring, J. (2012) "Statoil targets 60 % average oil recovery rate ". *Rigzone*. 29 August 2012.
- Marcel, V. (2006) "*Oil Titans: National Oil Companies in the Middle East*". London: Chatham House.
- Martin, M. (2017) "Saudi Aramco Said to Weigh up to \$ 5 bn of Renewable Deals". *Bloomberg*, London. 29 Jan. 2017.
- McAuley, A. (2016) "BP takes 10 Percent of Abu Dhabi's ADCO Onshore Oilfields for \$ 2.2 bn". *The National*, Abu Dhabi, 17 Dec. 2016.
- McAuley, A. (2017) "Total in Deal Making Mode Could Add to Abu Dhabi Shareholding". *The National*, Abu Dhabi. 19 May 2017.
- McKinsey & Company. (2015) "Saudi Arabia beyond oil: the investment and productivity transformation". Report. December 2015. McKinsey Global Institute, London.
- McPherson, C. (2008) "State Participation in the National Resource Sectors: Evolution, Issues and Outlook". *IMF Conference. Taxing Natural Resources: New Challenges, New Perspective, Washington, DC*. 24 Sept. 2008.
- Mearns, E. (2007) "Ghawar: an estimate of remaining oil reserves and production decline". *The Oil Drum*, Europe. 27 Apr. 2007.
- Mearns, E. (2016) "The Aramco IPO and the black art of estimating oil reserves". *Energy Matters*. 21 Nov. 2016.
- MEES. (2017a) "Saudi Aramco IPO plans progressing but key challenges lie ahead". London, Vol. 60, Issue No. 8, 24 Feb. 2017.
- MEES. (2017b) "Abu Dhabi Finalizes Onshore concession with Chinese Partnerships". *MEES*, London. 24 Feb. 2017.
- Meggison W. L. and Netter, J. (2001) "From State to Market: A Survey of Empirical Studies on Privatization". *Journal of Economic Literature*, Vol. 39, No. 2.
- Mekay, E. (2017) "Saudi Arabia and the world's largest IPO". *International Bar Association*, 5 May 2017.
- Meyer, H., Arkhipov, I. and Bierman, S. (2017) "Putin hosts Saudi King on 'landmark' Russia visit." *Bloomberg*, London, 5 Oct. 2017.
- Miao, Y. (2012) "*Oversea Listing and State-owned Enterprise Governance in China: Role of the State*". Harvard Law School. Harvard University. April.
- Mills, R. (2016) "How much would 5% of Saudi Aramco be worth?" *Petroleum Economist*. 27 Apr. 2016.
- Ministry of Finance. (2017) "Quarterly Budget Performance Report Q1 of FY 2017". *Ministry of Finance*, Riyadh. Apr. 2017.
- Moore, E. and Kerr, S. (2016) "Saudi Arabia's \$ 17.5 bn bond sale has lessons for debt market". *Financial Times*, London. 20 Oct. 2016.

- Motavalli, G. (2017) "European companies flocking into Tehran widen divide with Trump". *Bloomberg*. 5 Jul. 2017.
- Mufson, S. (2017) "Saudi Arabia, a Kingdom Built on Oil, Plans a Future Beyond it". *Washington Post*. 21 Apr. 2017.
- Nair, D., Habboush, M. and Martin, M. (2017) "ADNOC to plan IPO of retail unit at \$ 14 billion value". *Bloomberg*. 11 Jul. 2017.
- Nasser, A. (2014) "Aging Workforce at Saudi Aramco: Implications, Challenges and Strategic Directions". Lap Lampert Academic Publishing.
- Nasser, A. and Sabri, N. (2004) "Reserves and sustainable oil supplies: Role of technology and management". *5th International Oil Summit*, Paris, France. 28 Apr. 2004.
- Naughton, B. (2006) "Top-Down Control: SASAC and the Persistence of State Ownership in China". Paper for China and the World Economy. Leverhulme Centre for Research on Globalization and Economic Policy. University of Nottingham. 23 June.
- Nazer, H. (1991) "The Economic Development and Oil Policy in Saudi Arabia". *Eminent Speaker Series, Harvard Business School, Boston, USA*. May 1991.
- Neate, R. (2013) "Rosneft Takes TNK-BP in \$ 55 billion Deal". *The Guardian*, London. 21 March 2013.
- Nereim, V. and Abu-Nasr, D. (2017) "Saudi Billionaire says Companies Struggled to 'Absorb' Reforms". *Bloomberg*, London. 20 May 2017.
- Nereim, V. and Wilkin, S. (2016) "Sabic, Saudi Aramco form team to rush oil-to-chemicals project". *Bloomberg*. 19 Oct. 2016.
- Nereim, V., Carey, G. and Shahine, A. (2017) "Saudi Arabia's Al Twaijri Talks Bonds, Budget and Big Spending". *Bloomberg*, London. 10 May 2017..
- Nereim, V., Mahdi, W. and Stanley, B. (2017) "Saudi Oil Minister says Aramco reserves 'very reassuring'". *Bloomberg*, London. 2 Feb. 2017.
- Nereim, V. (2017) "Saudi Arabia Redoing Reform Plan it Rushed Last Year". *Bloomberg*, London. 7 Sept. 2017.
- New York Stock Exchange. (2013) "IPO Guide", Second Edition. Chicago: Caxton Busienss & Lega Inc..
- New York Stock Exchange. <http://www.nyse.com>
- Noreng, O. (1980) "The Oil Industry and Government Strategy in the North Sea". London: Croom Helm.
- Noreng, O. (1994) "National Oil Companies and their Government owners: the Politics of Interaction and Control". *Journal of Energy and Development*, Vol. 19, pp. 197–226.
- Noreng, O. (1997) "Oil and Islam: Social and Economic Issues". Chichester: John Wiley & Sons.
- Obaid, Nawaf. (2001) "The Oil Kingdom at 100: Petroleum Policymaking in Saudi Arabia". *Washington Institute for Near East Policy Papers*. No. 55. 1 Dec. 2001.
- Oil and Gas. (2012) "Aramco in Corruption Clampdown Following Tyco Case". *Arabian Oil and Gas*. 4 Nov. 2012.
- OPEC. (2015) "Annual Statistical Bulletin". OPEC, Vienna, www.opec.org/publications.
- Pacheco, F. (2017) "Qatar crisis bashes Gulf assets' status as Middle East haven". *Bloomberg*. 15 Jun. 2017.
- Parra, F. (2004) "Oil Politics: A modern history of petroleum". New York: I.B. Tauris.
- Pelin, Eli Roberto. (1997) "The Brazilian Energy Sector: Challenges for Development, Environment and Commercial Policy" in Maria J.F. Willumsen and Eduardo Giannetti da Fonseca, *The Brazilian Economy: Structure and Performance in Recent Decades*. Miami, FL: North-South Center Press, pp. 87–116.
- Petrobras. (2015) "Sustainability Report 2015". Petrobras, Brazil.
- Petrobras. (2016a) "Report to the Administration". Petrobras. Brazil.
- Petrobras. (2016b) "Strategic Plan 2017-2021 Business and Management Plan". Petrobras, Brazil. Sept. 2016.
- Petrobras. (2017) "Form 20-F Annual Report 2016 pursuant to Section 13 of 15(d) of the SEC Act of 1934". U.S. Securities and Exchange Commission, Washington, USA. April 26, 2017.
- Petroleum Economist. (2017) "Saudi Aramco's shifting strategy". 11 May 2017.

- Pledge, T. and Tahlawi, W.A. (1998). "Aramco and Its People: A History of Training". *Saudi Arabia Oil Company*.
- Poussenkova, N. (2007) "Lord of the Rigs: Rosneft as a Mirror of Russia's Evolution". Houston: James Baker III Institute for Public Policy: Rice University.
- Prizzia, R. (2001) "Privatization and social responsibility: a critical evaluation of economic performance". *International Journal of Public Sector Management*. Vol. 14(6), pp 450–464.
- Putin, V. V. (1999) "Mineral and Raw Material Resources and the Development Strategy for the Russian Economy". St Petersburg.
- PWC. (2012) "Listing in the U.S.: A guide to a listing of equity securities on NASDAQ and NYSE". www.pwc.com/ua/capital-markets
- Ramady, M. (2010) "The Saudi Arabian Economy: Policies, Achievements and Challenges". New York: Springer.
- Ramady, M. (2014) "Political, Economic and Financial Country Risk: Analysis of Gulf Cooperation Council". New York: Springer.
- Ramady, M. and Mahdi, W. (2015) "OPEC in a Shale Oil World: Where to Next?" New York: Springer.
- Randall, Laura. (1993) "The Political Economy of Brazilian Oil". Westport, CT: Praeger.
- Rashad, M. (2017) "Exclusive: Saudi to Shelve, Reform billions of Dollars of Unfinished Projects-Sources". *Reuters*, London. 17 Apr. 2017.
- Rasooldeen, M. (2017) "King Salman to begin Asian tour in Malaysia". *Arab News*, Jeddah. 27 Feb. 2017.
- Raval, A and Johnson, M. (2007) "Boost for London bid to land Saudi Aramco IPO". *Financial Times*, London. 8 Jun. 2017.
- Raval, A, Fontanella-Khan, J. and Massoudi, A. (2017) "Banks secure key advisor roles on Saudi Aramco IPO: JP Morgan, Morgan Stanley and HSBC to work on what is expected to be a record listing". *Financial Times*, London, 30 Mar. 2017.
- Raval, A., Johnson, M. and Fontanella-Khan, J. (2017) "Lawyers warn Aramco of New York litigation risks". *Financial Times*, London. 5 Jun. 2016.
- Raval, A. (2017a) "Saudi Aramco cleans up financials to bolster valuation". *Financial Times*, London. 18 Jun. 2017.
- Raval, A. (2017b) "Saudi Aramco strives to curb its state role before IPO". *Financial Times*, London. 18 Jun. 2017.
- Raval, A. and Kerr, S. (2017) "JP Morgan, Morgan Stanley set for key Aramco IPO role". *Financial Times*, London. 17 Feb. 2017.
- Raval, A. and Sheppard, D. (2016) "Non-OPEC Producers Agree to Cut Output". *Financial Times*, London. 10 Dec. 2016.
- Reed, S. and Merced, M. (2017) "Britain aggressively courts \$ 2 trillion Saudi Aramco listing". *The New York Times*. 13 Jul. 2017.
- Reuters. (2016) "Saudi-Iran Tensions Scupper Deal to Freeze Oil Output". *Reuters*, UK. 18 Apr. 2016.
- Reuters. (2017) "Mohammed bin Salman: Aramco Sale won't be for off 5 Pct, will happen in 2018". *Reuters*, London, UK. 3 May 2017.
- Rihani, A (1928) "Ibn Saud of Arabia: His People and His Land". London: Constable & Co. Ltd.
- Robert, Bacon. (1999) "A Scorecard for Energy Reform in Developing Countries" in *Public Policy for the Private Sector*, Note no. 175, April 1999, available at [<http://www.Worldbank.org/html/fpd/notes/175/175bacon.pdf>].
- Robinson, J. (1988) "Yamani: The inside story". London: Simon & Schuster.
- Rodrik, D. (2007) "One Economics, Many Recipes: Globalization, Institutions, and Economic Growth". Princeton, NJ: Princeton University Press.
- Roosenbloom, P. (2012) "Valuing and pricing IPO's". *Journal of Banking and Finance*, Vol. 36, No. 6, pp. 1653–1664.
- Rosneft. (2006). "Offer Document". Moscow: Rosneft.
- Rosneft. (2007) "Annual Report 2006". Moscow: Rosneft.

- Rosneft. (2010) “*Company Highlights*”. Moscow: Rosneft.
- Rosneft. (2011) “*Annual Report 2010*”. Moscow: Rosneft.
- Rosneft. (2016) “*Annual Report 2015*”. Moscow: Rosneft.
- Rosneft. (2017) “*Annual Report 2016*”. Moscow: Rosneft
- Sabah Z., Shahine, A. and Neriem, V. (2017) “Saudi King names son as Heir to throne in shakeup”. *Bloomberg*. 21 June 2017.
- SABIC. (2017) “Annual Report 2016: Driving Change Accelerating Growth”. *SABIC*, Riyadh. 2017.
- Said, S., Farrell, M. and Scheck, J. (2017) “Hurdles Mount for Saudi Aramco IPO”. *Wall Street Journal*, New York. 17 Feb. 2017.
- Sampson, A. (1976) “*The Seven Sisters*”. New York: Bantam.
- Saudi Arabian Government. (2016a) “Vision 2030 Official Website. www.vision2030.gov.sa”. June 2016.
- Saudi Arabian Government. (2016b) “Fiscal Balance Program: Balanced Budget 2020”. pp. 58, 61. <http://vision2030.gov.sa>
- Saudi Aramco. (2011a) “Energy to the world: The story of Saudi Aramco. Volume 1”. *Aramco Services Company*, Houston, USA. Vol. 1.
- Saudi Aramco. (2011b) “Energy to the world: the story of Saudi Aramco: Volume 2”. *Saudi Aramco Services Company*, Houston, USA, Vol. 2.
- Saudi Aramco. (2015) “Citizenship Report 2014”. *Saudi Aramco*, Dhahran. 11 May 2015.
- Saudi Aramco. (2016a) “*The Arabian Sun*”. Vol. LXXI, No. 17, *Saudi Aramco*, Dhahran. 27 Apr. 2016.
- Saudi Aramco. (2016b) “Annual Review 2015”. 26 May 2016. www.saudiaramco.com. Dhahran, Saudi Arabia.
- Saudi Aramco. (2016c) “Facts and Figures 2015”. *Saudi Aramco*, Dhahran. 21 June 2015.
- Saudi Aramco. (2016d) “Saudi Aramco confirms it Unveiled a Corruption Case Associated with Embraer”. *Saudi Aramco*, Media Centre, Dhahran. 26 Oct. 2016.
- Saudi Aramco. (2017a) <https://www.iktva.sa>
- Saudi Aramco. (2017b) “Board meets in Shanghai, Appoints Nine to Positions”. *The Arabian Sun*, Vol. LXXII, No. 20, 17 May 2017, pp. 1–3.
- Saudi Aramco. (2017c) “Saudi Aramco Sukuk Company SR 37.5 billion Sukuk Issuance Program”. *Base Prospectus, Saudi Aramco*, Dhahran. 21 Mar. 2017.
- Saudi Aramco. (2017d) “Saudi-U.S. collaborating toward a Vision: MOU’s and Agreements Signed at Forum”. *The Arabian Sun*. Vol. LXXII. No. 21. 24 May 2017. P. 3.
- Saudi Aramco. (2017e) “Saudi Aramco Annual Review 2016”. *Saudi Aramco*, Dhahran, Jul. 2017.
- Saudi Gazette. (2017) “Aramco to establish hospitality training center for Saudi youth”. *Saudi Gazette*, Jeddah. 18 May 2017.
- Saudi Press Agency. (2016a) “Saudi Arabia’s Vision for 2030”. Riyadh. 25 April 2016.
- Saudi Press Agency. (2016b) “Royal Court Statement”. 7 May 2016.
- Scheck J. (2017) “Saudi Aramco Struggle to Untangle Government Ties – Energy Journal”. *The Wall Street Journal*, Washington. 26 May 2017.
- Seba, E. (2017) “Saudi Aramco plans up to \$ 30 billion investment in MOTIVA by 2023”. *Reuters*. 27 May 2017.
- Selar, E. (2000) “*You don’t always get what you pay for: The economics of privatization*”. Ithaca, NY: Cornell University Press.
- Sequeira, J. (2017) “Sadara CEO says Jubail chemical complex nearly complete”. *Argaam*, 12 Jan. 2017.
- Sfakaniakis, J. (2017) “Aramco IPO is just first Step for Saudi Arabia”. *Bloomberg*. 5 Apr. 2017.
- Shamseddine, R. (2017a) “Saudi Aramco names Company Veteran to Oversea IPO Preparations-Source”. *Reuters*, London. 24 Apr. 2017.
- Shamseddine, R. (2017b) “Saudi Aramco says to set up new chemicals unit”. *Reuters*, London. 17 May 2017.
- Shamseddine, R. (2017c) “Saudi Aramco, France’s Total in talks for mixed-feel crackers: report”. *Reuters*, 4 Jul. 2017.

- Shamseddine, R. (2017d) "Saudi Aramco gets approval to set up companies for energy industrial city". *Reuters*. 10 Jul. 2017.
- Shamseddine, R. and Aswad, C. (2017) "Saudi Aramco Selects FTI as Global Media Advisor for IPO-Sources". *Reuters*, London. 13 Mar. 2017.
- Shamseddine, R. and Paul, K. (2017a) "Saudi Aramco CEO says to sign \$ 50 billion of deals with U.S. companies". *Reuters*. 20 May 2017.
- Shamseddine, R. and Paul, K. (2017b) "Saudi Arabia may seek funding in Chinese Yuan". *Reuters*, London. 24 Aug. 2017.
- Shamseddine, R. and Rashad, M. (2017) "Saudi Arabia sweetens huge Aramco IPO with tax cut". *Reuters*, London. 28 Mar. 2017.
- Shamseddine, R., El Gamal, R. and Chen, A. (2017a) "Aramco Board to meet in Shanghai as it seeks Chinese investors for IPO". *Reuters*, London. 10 Apr. 2017.
- Shamseddine, R., El Gamal, R. and Lawler, A. (2017b) "Trillion-dollar question looms as Aramco audits oil reserves". *Reuters*, London. 11 Mar. 2017.
- Sharafadin, B. (2017) "Total makes Iran return with South Pars gas deal". *Reuters*. 3 Jul. 2017.
- Share, Jeff. (2000) "Energy Giant Must Change to Prosper, Statoil CEO Says". *Pipeline & Gas Journal*, August, pp. 38–39.
- Sharif, A., Narayanan, A. and Pronina, L. (2016) "Saudi Arabia raises \$ 17.5 billion in record sovereign bond sale". *Bloomberg*, London. 19 Oct. 2016.
- Sheldrick, A. and Tsukimori, O. (2017) "Tokyo bourse, Aramco considering group to study IPO listing in Japan". *Reuters*, London. 13 Mar. 2017.
- Sheshinski, E. and Lbpez-Calva, L. F. (1999) "Privatization and its Benefits: Theory and Evidence". *CESifo. Economic Studies*, Vol. 49, pp. 429–459.
- Sim, Li-Chen. (2017) *The Rise and fall of Privatization in the Russian Oil Industry*. London: Palgrave MacMillan.
- Simmons, M. (2006) *Twilight in the Desert: The coming Saudi oil shock and the world economy*. USA: John Wiley.
- Simmons, Matthew. (2005) *Twilight in the Dessert: The Coming Oil Shock and the World Economy*. John Wiley & Sons.
- Singapore Stock Exchange. <http://www.ses.com>
- Sinopec. (2015a) "Annual Results for the Year Ended 31 Dec. 2015". *Hong Kong Exchanges and Clearings Ltd.*, Hong Kong, 2015.
- Sinopec. (2015b) "Sinopec Oilfield Services Corporation: Annual Report 2015". *Sinopec*, China.
- Sinopec. (2017) "Annual Results and Accounts for the Year ended 31 Dec 2016". *Hong Kong Exchanges and Clearings Ltd.*, Hong Kong, 2017.
- Smith, Peter Seaborn. (1976) *Oil and Politics in Modern Brazil*. Toronto: Macmillan.
- Soldatkin, V and Golubkova, K. (2017) "Russia, Saudi Arabia cement new friendship with King's visit". *Reuters*, London, 5 Oct. 2017.
- Statoil. (2001) "IPO Prospectus". *Statoil*, Norway. 18 June 2001.
- Statoil. (2016a) "Annual Report 2015 on Form 20-F". *Statoil*, Norway.
- Statoil. (2016b) "Board Statement on Corporate Governance 2015". *Statoil*, Norway.
- Statoil. (2016c) "Statutory Report 2015". *Statoil*, Norway.
- Statoil. (2017) "Annual Report 2016 on Form 20-F". *Statoil*, Norway.
- Stegner, Wallace. (2007) *Discovery: The Search for Arabian Oil*. Selwa Press. 1971/2007.
- Stevens, P. (2011) *A Methodology for Assessing the Performance of National Oil Companies*. Washington: World Bank.
- Svenda, J. (2017) "The Most Important Question Regarding Aramco's IPO". <https://seekingalpha.com/article/4048256>. 22 Feb. 2017.
- Symonds, W. (1993) *Jebel Dhahran and the New Saudi Generation*. Houston: Brockton Publishing.
- Tan, F. (2017) "Indian Oil Corp. in early talks with Aramco for downstream project". *Reuters*. 8 May 2017.
- Taylor, M. (2012) *The Political Economy of State-owned Enterprises in China and India*. New York, NY: Palgrave Macmillan. pp. 69–93.

- The Economist. (2016) "Transcript: Interview with Mohammed bin Salman". *The Economist*, London. Jan. 2016.
- The Oil Drum. (2007) "Simple mathematics – the Saudi reserves, GOSPS and water injection". *The Oil Drum*, Europe. 9 Apr. 2007.
- Thurber, M., & Istad, B. T. (2010) "*Norway's Evolving Champion: Statoil and the Politics of State Enterprise*". Stanford: PESD Stanford.
- Tokyo Stock Exchange. <http://www.tse.or.jp/english>
- Torchia, A. (2017a) "Budget pressure likely to keep Saudis propping up oil prices". *Reuters*, London. 22 May 2017.
- Torchia, A. (2017b) "Qatar debt rating downgraded by S&P as Riyal hits 11 year low". *Reuters*, London. 8 Jun. 2017.
- Tordo, S. (2009) "*Petroleum Exploration and Production Rights. Allocation Strategies and Design Issues*". Washington: World Bank.
- Tordo, S., Tracey, B. and Arfaa, N (2011) "National Oil companies and value creation". *The World Bank*, Washington, working paper No. 218. 2011.
- Twitchell, K. (1947) "*Saudi Arabia: with an account of the Development of its Natural Resources*". Princeton: Princeton University Press.
- U.S. Senate. (1979) "*The future of Saudi Arabian oil production: Staff report to the subcommittee on International Economic Policy of the committee on Foreign Relations*". Washington, D.C., USA. Apr. 2979.
- UBS. (2017) "Global oil and gas: Focus on Saudi Aramco". *UBS*, London. Global Research. 9 Jul. 2017.
- United Nations. (2017) "United Nations Human Rights – Office of the High Commission: End of Mission Statement by Professor Philip Alston, Riyadh. www.ohchr.org, 19 Jan. 2017.
- Vitalis, R. (2007) "*America's Kingdom: Mythmaking on the Saudi Oil Frontier*". Stanford: Stanford University Press.
- Viola, J. (1986). "*Human resource development in Saudi Arabia*". Boston, MA: International Human resources Development Corporation.
- Wainberg, M. and Foss, M. (2007) "Commercial Frameworks for National Oil Companies". Working Paper. *Bureau of Economic Geology*, Jackson School of Geosciences, University of Texas, Austin, USA. Mar. 2007.
- Waldman, P. (2016) "The \$ 2 Trillion project to get Saudi Arabia's economy off oil". *Bloomberg*, London. 21 Apr. 2016.
- Wang, J. (2006) "*Strategic Challenges and Strategic Responses: The Transformation of Chinese State-owned Enterprises*". Oxford: Chandos.
- Warner, J. (2017) "Saudis whopping Aramco listing faces a long slog to the LSE". *Daily Telegraph*, London. 7 Jun. 2017.
- Watkins, S. (2017) "Doubts remain Despite Aramco's IPO Charm Offensive". *MEOG – Middle East Oil and Gas*. Week 16, Apr. 2017.
- Watts, J. (2017) "Operation car wash: is this the biggest corruption scandal in history?" *The Guardian*, London. 2 Jun. 2017.
- Wharton. (2017) "A boutique investment bank's Aramco IPO grand slam". *Knowledge at Wharton*, Wharton University, USA. 16 Feb. 2017.
- Wolf, C. and Pollitt, M. (2009) "The Welfare Implication of Oil Privatization: A Cost-Benefit Analysis of Norway's Statoil". *Cambridge Working Paper in Economics*, 0912. Cambridge, UK. Jan, 2009.
- Wolf, C. (2008) "Does Ownership Matter? The Performance and Efficiency of State Oil vs. Private Oil 1987-2006". *EPRG Working Paper 0813*, Cambridge University, Cambridge, UK.
- Wolf, C. and Pollitt, M. (2008) "Privatizing National Oil Companies: Assessing the Impact on Firm Performance". *Judge Business School*. Working Paper 02/2008, University of Cambridge.
- World Bank. (2008) "A Citizen's guide to National Oil Companies – Part A. Technical Report". *World Bank*, Washington, USA. Oct. 2008.

- World Petroleum Council. (2008) "Petroleum Resources Management System". *World Petroleum Council*, USA. 7 Jan. 2008.
- Wright, M., Hoskisson, R. E., Filatotchev, I. and Buck, T. (1998) "Revitalizing privatized Russian Enterprises". *Academy of Management Executive*, Vol. 12, pp. 74–85.
- Yusuf, S., Nabeshima, K. and Perkins, D. H. (2006) "*Under New Ownership: Privatizing China's State-owned Enterprises*". Palo Alto, CA: Stanford University Press.
- Zareen, N. (2017) "Saudi Arabia disrupts attack on Marjan oil field". *Argaam*, 19 Jun. 2017.
- Zhang, Y. (2008) "*Large Chinese State-owned Enterprises: Corporatization and Strategic Development*". Houndmills, Basingstoke, Hampshire, UK: Palgrave MacMillan.
- Zhdannikov, D. and Soldatkin, V. (2017) "'Axis of Love': Saudi-Russia détente heralds new oil order". *Reuters*. 1 June 2017.
- Zhu, J., Shamseddine, R. and El Gamal, R. (2017) "Exclusive: China gathers state-led consortium for Aramco IPO – sources". *Reuters*, London. 20 Apr. 2017.

Index

A

- Abdul-Aziz, King*, 5, 6, 8, 12, 21, 49, 50, 56, 64
Abdul Aziz, Nayef bin, 64
Abdullah, King, 19
Aberdeen, 35, 187
Abqaiq, 27, 178, 198
Abraaj Group, 220
Abu Dhabi, 9, 52, 225, 226, 241
Abu Dhabi National Oil Company (ADNOC), 100, 241, 255
Addax Petroleum, 155
 Sinopec acquisition, 155
Alibaba IPO, 223
Al Faqeer, Faisal, 182
Al Jad'aan, Mohamed, 68, 87
Al Naimi, Ali, 9–11, 14, 15, 18, 22, 67, 246
Alrowaily, Sheila, 18, 174
Alston, Philip, 76
Angola, 83, 120, 121
Apache Corporation, 155
Arab embargo, 9
 1973 war, 9
Arab Spring, 64, 225
ARAMCO
 Board of directors, 11, 184
 carbon capture, 74, 200, 250, 251, 254
 CEO's, 2, 11, 14, 28, 53, 58, 152, 174, 185, 225
 concession agreements, 1
 CSR, 23, 90, 91, 112
 domestic assets, 58
 employees, 12, 16, 18, 91, 181, 182
 employment, 252, 253
 gas reserves, 74, 168
 Ghawar, 204
 governance, 188
 history, 1, 17, 23
 IKTVA, 82, 84
 IPO, 8, 21, 31, 43, 44, 49, 50, 58, 66, 94, 99, 130, 167–256
 JV's, 178, 179
 listing, 203
 localization, 84
 logo, 1
 management, 10, 12, 21, 171, 179
 ownership, 28, 235
 production, 4
 refineries, 29
 reserves, 204
 royalty, 4, 130
 Supreme Council, 184, 188
 tax, 169, 235
 training, 18
 valuation, 171, 229–232
 women, 16, 18, 90
Aramco Overseas Company B.V. (AOC), 48
 Offices, 48
ARLANXEO, 48
ASEAN, 34
Assaf, Ibrahim, 68, 186
Associated gas, 26, 27, 43
ATC, 35
Awami, Fatema, 18

B

- Baker Hughes*, 90, 128, 203
BAPCO, 27
Bargar, Thomas, 11–13, 17
Barkindo, Mohammed, 233

Basic chemicals, 51
 Bechtel, 87
 Beijing, 35, 55, 151, 206
BlackRock Inc., 104, 136, 151
 BP, 8, 74, 96, 103–105, 107, 113, 193, 241
 Brazil
 car wash scandal, 136
 concessions, 8
 corruption, 83, 136, 206
 deep water reserves, 143
 government, 133
 salt water reserves, 133
 Senate, 200
 Brunei, 49, 50
 Brunswick, 190, 253
Buainain, Ibrahim, 18, 35

C
California Arabian Standard Oil Company (CASOC), 1
 Canada, 90, 120, 122
 oil sands, 120
Cantor, Eric, 219
 Carbon capture and storage (CCS), 56, 122
 carbon capture, 56, 122
 CCP. *See* Chinese Communist Party (CCP)
 Chemicals
 growth, 41
 potential, 38, 236
 products, 31
 Chevron, 9, 107, 133, 176
 China
 communist party, 147–149, 152, 157
 exports, 49
 imports, 26, 85
China National Petroleum Industry (CNPC), 48, 103, 148, 241
 Chinese Communist Party (CCP), 147–149, 152, 157
 College of Petroleum and Minerals (CPM), 9
 students, 9
 Concession
 agreement, 1, 5, 6, 19, 176
 Aramco, 19, 221
 Conoco Phillips, 203, 208
 Corporate governance, 75, 104, 113, 114, 118, 125, 127, 128, 133, 134, 139, 147, 151, 159–162, 169, 183, 184, 188, 190, 193, 206, 212, 214–216, 249, 253
 Cracker plants, 48, 51
Crane, Charles, 5

D
 DCF. *See* Discounted Cash Flow (DCF)
DeGolyer & MacNaughton, 105, 107, 122, 124, 125, 143, 203
 Delft, 35, 129
 Dhahran, 1, 3, 56, 91
Dhahran Techno Valley Company (DTVC), 56
 Directors, 114, 138, 154, 160, 188, 211–213, 217, 219
 independent, 114, 138, 160, 188, 211, 213, 217
 Discounted Cash Flow (DCF), 224, 243
 Dividend, 85, 94, 105, 110, 117, 118, 130, 131, 136, 146, 220, 221, 225, 234, 235, 243, 245, 251
 payout, 116–118, 135, 171, 234, 235
 Dow Chemical, 15, 31, 42, 90, 182, 239
 Downstream, 8, 15, 25, 31, 41, 48, 51, 54, 58, 59, 62, 72, 73, 75, 91, 98, 107, 120, 133, 138, 148, 158, 165, 174–178, 181, 182, 193, 238–241, 250, 252, 253, 255
Dudley, Robert, 115

E
 Economic, 5, 7, 11, 12, 16, 25, 26, 28, 40, 48, 49, 61, 62, 64, 65, 68, 70, 87, 90, 93, 98–101, 105, 119, 124, 127, 134, 135, 152, 158, 167, 168, 170–172, 222, 233, 240, 242, 243, 247, 248, 256
 diversification, 34–38, 48, 119, 170
 Economic value-added (EVA), 224
 Egypt, 155, 225
 Embraer
 corruption, 21, 118
 payments, 21
Emerson, 90
 Energy
 city, 89, 252
 efficiency, 74, 75, 79–82, 171, 178, 250–252
 Eni, 21, 48, 108
 Esso, 8
 Ethane, 26, 31, 46, 47
 Ethylene, 41–43, 46, 51, 154
 European Union (EU), 130, 215
 EVA. *See* Economic value-added (EVA)
 Evercore, 219
 Exploration and Petroleum Engineering Center (EXPEC), 14, 55, 179
 Exxon Mobil, 28, 31, 32, 107, 108, 116, 210

F

Fadhili, 26
Fahd, King, 9, 21–23, 71, 91, 181, 186
Faisal, King, 6, 7, 18, 19, 21, 186
Falih, Khalid, 11, 15, 16, 20, 22, 59, 67, 71,
 72, 82, 89, 91, 152, 184, 186, 188, 203,
 205, 219, 220, 225, 233, 246
 Financial, 7, 58, 93, 99, 108, 112, 114, 156,
 162, 164, 165, 170
 diversification, 170, 248, 255
Financial Conduct Authority (FCA), 206, 207, 217
Fouad, Abdullah, 13
 France, 54, 96, 179, 239, 241
 elections, 246
 FTI, 190
 FTSE Index, 207
 inclusion, 207, 217
*Fujian Refining and Petrochemical Company
 (FREP)*, 32

G

Gaffney, Cline & Associates, 203, 251
 Gas oil separation plan (GOSP), 200
 GDP
 growth, 37, 38
 Saudi, 38, 252
General Electric, 90, 252
 Ghawar, 5, 27, 57, 75, 81, 193, 195–200, 204, 223
Ghpson, Huda, 18, 174
 Glencore, 105
Gould, Andrew, 187
 Gulf Cooperation Council (GCC), 26, 32, 64,
 225, 241, 254

H

Hadrami, Said, 35, 175, 177
 The Hague, 35
 AOC office, 48
Halliburton, 90
Hamilton, Lloyd, 5, 12
Haradh, 27, 197
Holmes, Frank, 5
Honeywell, 90
 Hong Kong, 50, 150–154, 205, 206, 209–213,
 216, 218, 219
 listing, 205
 Horizontal drilling, 15
 HSBC, 82, 104, 187, 209, 219
Husseini, Najdat, 18
Husseini, Sadad, 18, 204
 Hyundai, 88, 239, 252

I

iDiscover, 91, 252
 India, 25, 35, 48, 51, 85, 224
Indian Oil Corporation (IOC), 51
 Indonesia, 19, 48–50, 95, 193
 In-Kingdom Total Value Add (IKTVA), 12, 72,
 82–87, 89, 250
 International Energy Agency (IEA),
 42, 51
 IPO
 alternatives, 236, 255
 assumptions, 223, 228, 231, 253
 issues, 31, 58, 94, 247, 253
 listing, 50, 183, 188, 207, 209, 214, 217,
 219, 226, 240, 244, 254
 planned, 7, 15, 23, 35, 50, 58–59, 75,
 82, 91, 166, 181, 182, 188, 203,
 225, 228, 233, 240, 241, 247,
 249, 250, 255
 prospectus, 119, 251
 timing, 43
 valuation, 183, 193, 208, 223, 231,
 238–243, 246
 Iran, 47–49, 95, 119, 193
 iSpark, 91, 252
 Israel, 9
iThra, 91, 252

J

Jacobs Engineering, 89
Jasser, Mohammed, 68, 85
 Jeddah, 20, 29, 178, 238
Jinping, Xi, 49, 157
 JP Morgan Chase, 226
 Jubail, 20, 27, 29, 31, 39, 48, 71,
 86, 88
Judaimi, Abdulaziz, 41, 48,
 175, 176
Juma'h, Abdullah, 2, 11, 15, 18
Jungers, Frank, 11, 12, 14, 18
 Justice Against Sponsors of Terrorism Act
 (JASTA), 172, 208, 218

K

KA-CARE, 71, 82
 KAPSARC, 85, 177
 Karan, 81
Kelberer, J., 11, 12, 14, 18
Khowaiter, Ahmed, 18, 179
Khurais, 27, 198
Khursaniyah, 27, 197

King Abdullah University of Science and Technology (KAUST), 15, 55, 56, 71, 74, 175, 176, 179, 186, 187, 252
 King Fahd University of Petroleum and Minerals (KFUPM), 9, 56, 71, 74, 173, 176–179, 181, 182, 186, 187
Klein, Michael, 219
 Korea Advanced Institute of Science and Technology (KAIST), 55
 Kuwait, 8, 9, 49, 95, 155, 193–195

L

Labban, Ziad, 42, 182, 240
 Lamprell PLC, 88, 252
 LANXESS, 48, 180
Latsis, John, 21
 Lava Jato, 136
 scandal, 136
 Liquefied petroleum gas (LPG), 30, 43, 47, 125, 142
 London, 35, 103, 104, 131, 150, 178–180, 183, 205–212, 214–218, 244
 listing, 217, 218
 London Stock Exchange (LSE), 207, 209

M

Ma'aden, 40, 71, 221
Ma'ashouq, Motassem, 180
Macron, Emmanuel, 54
Mady, Mohammed, 38
Maharat, 90, 252
 Malaysia, 48–50, 95, 193
 Maldives, 49
Manifa, 27, 31, 198
Mansour, Nabeel, 73, 175, 176
 Market share, 10, 32, 64, 79, 246
 strategy, 10
May, Theresa, 206
Medvedev, Dimitri, 115
 Methane, 26, 46
 Middle East and North Africa (MENA), 76, 227
 Midyan, 26, 81, 88
Miller, Bert, 5
 MIT, 74, 176
 Mobil, 1, 8, 9, 20, 31, 200
Moelis & Co., 219, 220
Mohammed bin Nayef, 64
Mohammed bin Salman (MbS), 5, 7, 22, 23, 35, 40, 49, 59, 64, 66, 87, 167–169, 184, 245, 246, 248, 249

Moneef, Majid, 187, 239
Moody–Stuart, Mark, 187
 Moody's, 118, 147
 Morgan Stanley, 116, 219, 241
 Motiva
 acquisition, 180
 debt, 32, 36, 229
 expansion, 32, 36
Mousli, Naila, 18
Mufti, Yasser, 179
Mustafa, Ameer, 18

N

Nakheel, 220
Nasser, Amin, 11, 15, 18, 22, 28, 30, 51, 53, 58, 72, 128, 174, 239
National oil companies (NOCs)
 governance, 159, 191
 state relations, 134
National Project Management Organization (NPMO), 87
 National Transformation Program (NTP) 2020, 35, 45, 48, 52, 63, 69–72, 75, 81
 Natural gas liquids (NGL), 4, 20, 26, 34, 120, 125, 132, 144, 145, 175, 178
Nawwab, Fawaz, 182
Nazer, Hisham, 11, 21, 22, 61
 Net present value (NPV), 229–231, 233
 Nigeria, 83, 121
 Non-associated gas, 15, 27, 47, 58, 81
 Saudi Arabia, 15, 27, 81
 Non-OPEC, 10, 62, 63, 65, 105, 127, 167, 228, 242, 246, 247
 agreement, 63, 105
 Norsk Hydro, 126, 129
 Norway, 57, 83, 95, 96, 99, 118–132, 155, 166, 191
 Norwegian Petroleum Act, 125
Novak, Alexander, 108, 115, 116, 246
 NYSE, 161, 172, 188
 listing rules, 161, 188

O

Occidental Petroleum, 9
 Libya, 9
 Oil
 dependency, 8, 71, 249
 exports, 7, 32, 49, 75, 241
Olayan, Lubna, 169
Olayan, Sulaiman, 13
 One Belt, One Road, 49

- Organization for Economic Cooperation and Development (OECD), 122
- Organization of Arab Petroleum Exporting Countries (OAPEC), 8, 9
formation, 8
- Organization of the Petroleum Exporting Countries (OPEC)
agreement, 7, 105
policies, 228
production, 8, 10, 105, 127, 167, 168, 193, 200, 245, 246
- P**
- Palestine, 9
war, 9
- Paris, 35
- Peak demand, 16, 61, 81, 224
- Pertamina*, 50
- Petrobras
assets, 108, 133, 142, 156, 166
board, 140
corruption, 136, 222, 224
dividends, 136, 146
financials, 133, 141, 156, 159, 162, 164, 188, 224, 253
governance, 133
management, 138, 142, 160
ownership, 135
production, 146, 204, 224
- Petrochemicals
expansion, 8, 46
growth, 45
industry, 7, 25, 46, 78
input, 43
output, 34, 42, 45
products, 31
- Petrochina, 51, 95, 96, 107
- PETROMIN
corruption, 21
history, 19, 23, 250
management, 19–23
mandate, 19
- Petro Rabigh, 29–31, 41, 90, 176, 180, 182, 240
- Philippines, 35, 178, 180, 182
- Plas Chem Park*, 90
- Polymers, 38–40, 46, 48
- Poverty, 76–78
- Premium listing, 206, 207, 214, 217, 218
- Pricing, 142, 172, 208, 221, 224, 228, 242–244, 254
IPO, 242
- Privatization
policies, 94, 97, 99, 161, 247
problems, 7
- Production freeze, 65
- Public Investment Fund (PIF)
governance, 168, 170, 171, 235
investments, 170
strategy, 170
- Public sector, 62, 65, 68, 217
governance, 65, 159–161, 164, 173, 188–189, 253
- Putin, Vladimir*, 100, 101, 104, 108, 246
- Q**
- Qahtani, Mohamed*, 73, 176
- Qatar, 26, 47, 64, 105, 225
disputes, 26, 225
- Qatif*, 27, 198
oilfield, 30
- R**
- Rabigh*, 20, 21, 30, 90, 176, 182
- Ras Al Khair*, 88, 89, 222, 239, 252
- R&D
Aramco, 122, 254
Petrobras, 104
Rosneft, 122
Sinopec, 51, 251
Statoil, 119, 122
- Reserves
possible, 171
probable, 200, 201
proved, 113, 122–124, 132, 142, 144, 156, 200, 201, 203
- Resource
classification, 202
endowment, 190
nationalism, 7, 12, 19, 250
- Risk factors, 245
Aramco, 226
- Riyadh, 9, 20, 28, 30, 205
- Roadshow, 247
- Rowan Companies*, 86, 89
- Rumayyan, Yasir*, 67, 186
- Russia
oligarchs, 100, 104
OPEC agreement, 63
- S**
- Saadani, Abdullah*, 73, 177
- Sa'adi, Ahmad*, 73, 175
- SADARA, 6, 15, 31, 41–45, 49, 176, 180, 182, 250, 254
- Saggaf, Mohamed*, 173, 175
- Salman, King*, 22, 49–51, 59, 64, 74, 88, 89

- SASREF, 29–31, 177, 178
- SATORP, 15, 30, 31, 49, 176, 177, 182, 239, 250
- Saudi Acrylic Polymers Company (SAPCO)*, 38
- Saudi Arabia Advanced Research Alliance (SAARA), 56
- Saudi Arabian Basic Industries (SABIC)
- assets, 22, 40
 - expansion, 38
 - history, 252
 - oil to chemicals, 40, 41
 - US shale, 10, 34, 38, 41, 47, 120, 132, 158, 167
- Saudi Arabian Monetary Authority (SAMA), 68, 85, 235
- Saudi Aramco Mobil Refinery Company Ltd. (SAMAREF)*, 31, 177, 182
- Saudi Energy Efficiency Centre (SEEC), 81
- Saudi General Authority for Investment (SAGIA), 68
- Saudi Telecom Company (STC)*, 173
- Saudization, 9, 11, 14, 18
- policies, 10
- Schlumberger*, 90, 128
- Schroeder, Gerhard, 105
- Science, technology, engineering, mathematics (STEM) program, 90
- Sechin, Igor*, 99, 103
- Securities and Exchange Commission (SEC), 105–107, 131, 136, 143–145, 156, 161, 171, 188, 201–204, 208, 221, 233, 251
- New York, 136
- Sen Mei Petroleum, 32
- Seven Sisters, 7–10
- Shale
- gas, 15, 46, 120
 - oil, 10, 47, 62, 233
 - U.S., 34, 47, 120, 132, 158, 167
- Shaybah*, 15, 26, 27, 75, 198
- Shell, 8, 20, 28, 31, 74, 133, 186
- Showa Shell, 29, 32
- Singapore, 35, 39, 205, 206, 209–216, 218
- listing, 205, 206, 208–210, 215
- Sinopec
- assets, 147–149
 - board, 151, 153
 - dividends, 156
 - financials, 156, 160, 251
 - governance, 104, 151–153, 160, 164, 188–189
 - management, 52, 147, 149, 151, 156, 157, 160, 188
 - ownership, 28, 32, 39, 51, 149, 150, 160, 161, 188
 - production, 28, 31, 51, 96, 148, 149, 154–156, 158, 166, 204
- SME, 50, 171
- Society of Petroleum Engineers (SPE)
- definitions, 201, 251
 - valuation, 143
- Softbank, 50
- investments, 50
- S-Oil, 29, 32, 177, 178, 182
- South Korea, 31, 32, 35, 40, 55, 74, 177, 182
- South Pars, 47
- S&P, 118, 225
- Specialty chemicals, 32, 39, 41, 44, 48, 250
- Standard listing, 206, 208, 214, 215, 217
- Standard Oil of California (SOCAL), 1, 5, 6, 8, 19, 200
- Statoil
- assets, 149
 - board, 129, 130
 - dividends, 94, 117, 131, 136
 - financials, 94, 119, 130, 133, 134, 149
 - governance, 104, 118, 119, 127, 128, 136, 138, 147, 149, 158–162, 188–189, 200, 251
 - management, 138, 139, 160, 190
 - ownership, 119
 - production, 118–120
- Statoil Hydro, 126
- Steineke, Max*, 5
- Subsidies
- energy, 76, 77, 171, 251
 - policy, 80, 159, 220
- Sukuk, 1, 26, 131, 183, 223, 227
- Sulayman, Abdullah*, 5
- Sultan bin Abdul Aziz*, 21, 64, 71
- Sultan, Khaled*, 186
- SWOT, 241
- Aramco, 73, 250
- T**
- Tadawul, 50, 58, 169, 172, 186, 219
- Taher, Hadi*, 19, 20, 22
- Taiwan, 35
- Tamimi, Ali*, 13
- TAQNIYA, 56
- Tariki, Abdullah*, 7, 11, 19
- TASI, 45
- Texaco, 1
- Tokyo
- Aramco office, 50, 177, 205, 207, 209, 216
 - listing, 50, 216
- Total, 15, 30, 32, 46, 47, 52, 73, 117, 120, 182, 186, 204, 210, 239, 240
- Toyota, 48, 50, 53, 210, 224
- Saudi SUV car hub, 50

Trump, President, 48, 108
Tunisi, Nabila, 174
 Tyco, 21, 190
 bribery case, 190

U

UK, 12, 39, 54, 57, 96, 121, 124, 127, 129,
 177, 178, 187, 190, 206, 207, 215, 217,
 218, 253
 Ultra large crude carriers (ULCCs), 239
 United Arab Emirates (UAE), 47, 49, 100,
 193, 194, 220
 Upstream, 8, 15, 19, 25–27, 31, 41, 54, 73, 91,
 98, 107–109, 119, 133, 148, 156, 158,
 165, 174, 176–178, 181, 182, 186, 238,
 250, 252, 253
 USA, 5, 13, 14, 18, 20, 32, 39, 42, 44, 47, 52,
 58, 74, 102, 106, 108, 122, 124, 126,
 131, 132, 136, 143, 153, 172, 176, 177,
 182, 193, 209, 224, 228

V

Value-added taxes (VAT), 66, 167
 Venezuela, 19, 95, 100, 193, 194
 Very large crude carriers (VLCCs), 88,
 89, 239

Vision 2030, 5, 7, 13, 22, 25, 36, 40, 42, 45,
 46, 48, 52, 63, 64, 66–76, 79, 81,
 87–89, 169, 249, 253, 255

W

Wa'ed, 90, 252
Wahbah, Hafiz, 12
Wasit, 27, 81, 88
Weatherford, 90
 White & Case, 208, 219
Woicke, Peter, 187
Wuhaib, Abdulrahman, 73

X

Xavier, Rolet, 206

Y

Yamani, Zaki, 7–9, 19–22
 Yanbu, 20, 27, 29–31, 71, 178
 YASREF, 29–31, 178, 182
 Yuan currency, 238

Z

Zamil, Abdulaziz, 21