Chapter 4
Lessons from Other Petroleum-Rich States

Abstract The aim of this chapter is to assess the various policies adopted with respect to petroleum resource management in Norway, Kuwait, Azerbaijan and Nigeria. The author conducts a comparative analysis of the institutional design, human resource capacity development, and revenue management policy frameworks implemented by the four petroleum-producing countries in order to identify best practice. The main findings indicate that a petroleum resource curse is not inevitable. Prudent and sound institutional, human resource capacity building and petroleum revenue management policies help avoid transmission of the resource curse. This study suggests that a well-designed institutional governance model for the petroleum industry is vital to addressing common problems associated with effective economic and human resource development.

Keywords Resource curse · Institutional design · Human resource · Revenue management · Petroleum rich countries · Petroleum resource management

4.1 Introduction

The fact that some resource abundant countries, such as Norway, have escaped the resource curse while many others, such as Nigeria, have not is of particular interest to this study. The limitations of the economic literature on the resource curse lie in the inability of statistical analysis to answer a crucial question: why are some resource-rich countries able to utilise their natural resources to promote development while others are not?

The cross-country quantitative method of research is the most common analytical approach to analysis of the natural resource curse (Rosser 2006). However, as demonstrated in the previous chapter, this method falls short when attempting to explain obvious differences in the development experiences of various petroleum-rich countries. Ross (1999) highlights a gap between economic understanding and the politics of resource-rich countries. Furthermore, explaining causality in the transmission mechanisms of the resource curse requires deeper

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analysis of the particular natural resource at individual country level (Stevens and Dietsche 2008). As Maxwell (2004) emphasises, the qualitative approach considers causality in terms of processes and mechanisms, rather than simply demonstrating a correlation between existing variables. Ebbinghaus (2005) suggests that qualitative cross-country analysis is a more appropriate method than cross-country statistical analysis, based on assumptions regarding homogeneity, independence and the representativeness of the sample.

The qualitative method used in this chapter is a cross-country comparative approach (Bryman 2004; Rosser 2006). The goal is to demonstrate that, although statistical analysis of the resource curse seems to account for most of the difficulties confronting oil-rich states, a different picture is revealed when oil-abundant countries' economic, political and social policies and strategies are viewed in relative rather than absolute terms. From this perspective, the resource curse no longer appears to be inevitable or inescapable. Furthermore, undertaking cross-country comparative research will allow the Kurdistan region to learn from other countries' best practice in the governance of their oil and gas industries, enabling the Kurdistan Regional Government (KRG) to frame policy options for developing a long-term sustainable economy.

However, comparative analysis suffers from certain limitations, such as comparability, availability of datasets and generalisability. There is also the potential for differences, such as cultural factors, to be unobserved, while the historical, political and institutional context may make it difficult to replicate a policy from one country in another (Lijphart 1971; Synder 2001; George and Bennett 2005). Therefore, in this research an issue-oriented strategy (Stake 1995; Yin 2003) is used to analyse the adopted polices and measures across four selected cases. These policy areas are limited to the economic, political and socio-economic policies adopted by four major oil-exporting countries in response to the related transmission channels of the resource curse, based on the resource curse literature.

These countries—Norway, Kuwait, Azerbaijan and Nigeria—were selected on the basis of the research questions, the theoretical framework and prior knowledge of the cases (Ragin 1987). As major oil-exporting countries, considering their role in global energy security, the four case studies represent both the extremes and the middle range of oil-rich and resource curse characteristics. They also represent different approaches to governance of the oil and gas sector.

The following research questions framed the investigation of the best policy tools for addressing economic, political and socio-economic issues across the selected petroleum-producing countries:

1. How effective are institutional design and structure measures in addressing the political and economic issues associated with accountability, transparency and checks and balances?
2. How effective are policies and measures aimed at human resource capacity building?
3. How effective are economic policies in dealing with macroeconomic and petroleum revenue management issues?

Documentary sources were used for this cross-country comparative research. The general principles involved in handling and dealing with documentary resources are similar to those in other areas of social research. According to Scott (1990, p. 6), in handling documentary resources it is necessary to consider four criteria:

1. "Authenticity—whether the evidence is genuine and is of unquestionable origin;
2. Credibility—whether the evidence is free from error and distortion;
3. Representativeness—whether the evidence is typical of its kind and, if not, whether the extent of its specificity is known; and
4. Meaning—whether the evidence is clear and comprehensible."

Against this background, analysis of surveys, documents and reports published by governments relating to governance of the oil and gas sector provides information about the political, economic and social mechanisms that policy makers have chosen to manage their oil and gas resources and associated revenues.

The rest of this chapter is structured as follows. Section 4.2 starts with general information relating to the oil and gas industries of the selected countries, and then describes the implementation of institutional and administrative policies in governing the oil and gas sectors of the four petroleum exporters. Section 4.3 presents policies adopted by the respective governments to enhance their human resource capacity. Section 4.4 explains the economic policies adopted by the four cases to manage their petroleum revenues, as well as the measures taken to reduce their economic dependence on hydrocarbon revenues. Section 4.5 compares the institutional, human resource capacity-building and economic policies adopted by the four major oil-exporting countries, and Sect. 4.6 discusses the lessons learned from best practice.

4.2 Institutional Policy: The Role of Institutional Design and Frameworks in Petroleum Sector Governance

Institutional design should be taken into account in attempts to enhance the performance of the petroleum sector (Turber et al. 2011). Furthermore, setting up an effective petroleum-sector management system allows governments to make more efficient decisions on ways to manage their petroleum wealth.

The World Bank (Alba 2009) has set out an "extractive industry value chain" approach, which offers potential insights into the governance and institutional arrangements of petroleum-rich countries (Alba 2009). The natural resource management value chain focuses on institutional arrangements across the following key pillars of the extractive industry's value chain: (1) award of contracts or licences; (2) regulation and monitoring of operations; (3) revenue collection; and (4) revenue

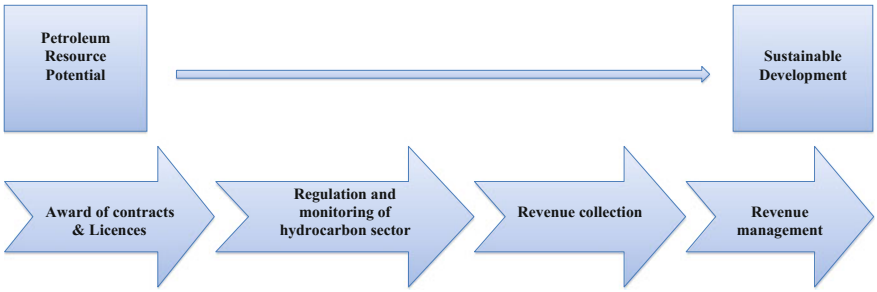

Fig. 4.1 Extractive industry value chain. *Source* Alba (2009)

management (Alba 2009, p. 3). This section considers the first three of these pillars, as shown in Fig. 4.1, while the fourth is discussed in Sect. 4.4.

4.2.1 Norway

Oil production began in Norway in 1971. The country has a population of more than five million. At that time, the country had well-functioning institutions, and shipping, fishing and the hydroelectric industry dominated its economy. However, petroleum exports formed 65% of its total merchandise exports in 2014 (World Bank 2015b).

Norway is now an important supplier of both oil and natural gas to other European countries. At the end 2014, its proven oil and natural gas reserves were about 6.5 billion barrels and 1.9 trillion m^3, respectively (BP 2015). All of Norway's oil reserves are located offshore on the Norwegian Continental Shelf (NCS), which is divided into the North Sea, Norwegian Sea and Barents Sea areas (NPD 2015). Norway is one of the major exporters of natural gas and crude oil. In 2013, it ranked as the third largest natural gas exporter after Russia and Qatar, and the twelfth largest exporter of crude oil in the world (OECD 2007; EIA 2014a). However, its petroleum production has gradually declined since 2001, as its oil fields have matured (see Fig. 4.2). The Norwegian Petroleum Directorate (NPD) recognises that maintaining production levels will be a big challenge for Norway as result of a continuing decline in crude oil production. Potential new discoveries will be the determining factor of future production levels (NPD 2015).

By contrast, the share of natural gas in Norway's total primary energy supply has grown since 1973, as it has progressively developed its large offshore gas fields on the NCS (IEA 2011). Only a small proportion of oil and natural gas is consumed domestically in Norway, as illustrated in Figs. 4.2 and 4.3. This is enabled by domestic reliance on renewable energies, including hydropower, wind and biomass (EIA 2014a). Consequently, Norway exports the vast majority of its oil and gas, and

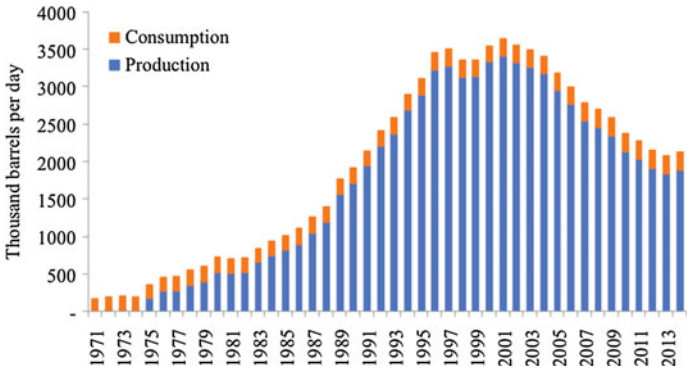

Fig. 4.2 Norway's crude oil production and consumption, 1971–2014. *Source* BP (2015)

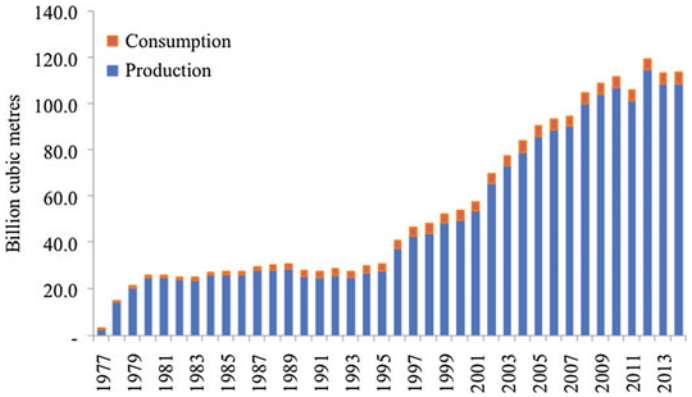

Fig. 4.3 Norway's natural gas production and consumption, 1977–2014. *Source* BP (2015)

is a significant exporter of crude oil and natural gas to EU countries, including the United Kingdom, Germany, France, the Netherlands, Belgium and Italy (NPD 2015). Norway is also a major supplier of refined fuel products, such as gasoline and diesel fuel, to European countries.

Figure 4.4 illustrates the location of the governance functions of the oil and gas sector in three separate organisational bodies: (1) policy-making (ministry), (2) regulation (NPD) and (3) operation (national oil company) (Hunter 2014).

Petroleum resources and all related revenues are the property of the Norwegian state. The fiscal regime in Norway is based on a concessionary system, under which the Norwegian government grants a licence to one or more oil companies giving exclusive rights for a limited period to the surveying, exploratory drilling and production of petroleum within the geographical area covered by the licence. This fiscal regime works through the payment of royalties and taxes to the state. Under the Petroleum Act, the Ministry of Petroleum and Energy (MPE) is authorised to

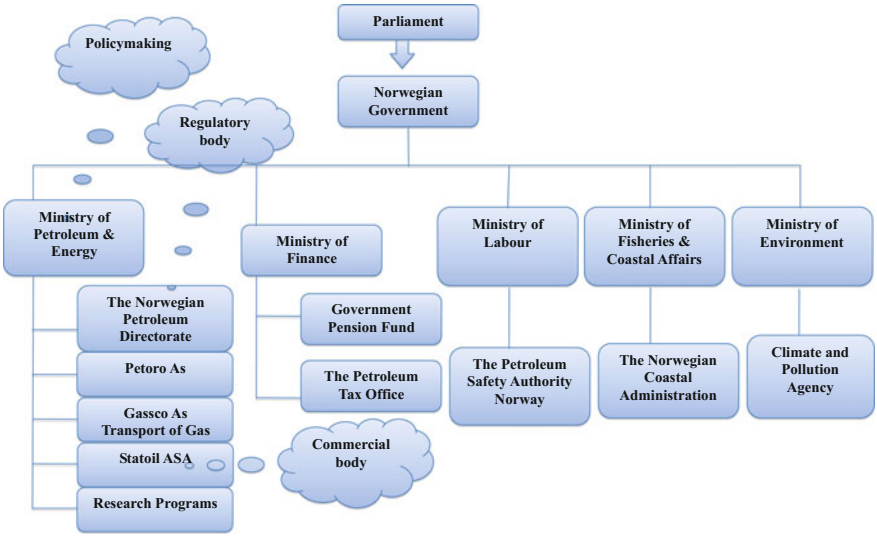

Fig. 4.4 Organisational structure of Norway's petroleum sector. *Source* NPD (2015, p. 17)

award licences and approvals for operators' field and pipeline development plans, while the NPD plays an advisory role in all steps of the licensing process when it comes to negotiation with individual companies (NPD 2015).

The Norwegian parliament has delegated responsibility for policy making to the MPE, which manages resources on the NCS to ensure that petroleum activities are carried out in line with guidelines set by the parliament and the government. The MPE is also charged with impact assessment regarding environmental and social aspects of petroleum activities prior to the opening of new areas. It fully owns two companies, Petro AS and Gassco AS, and partially owns Statoil. In order to gain control of the transmission of natural gas, the Norwegian government established a stated-owned company, Gassco AS, which manages the transportation of gas in the NCS and is the operator for Gassled (NPD 2015). The petroleum sector has cooperative links with a number of ministries, such as the Ministry of Labour, as well as the Ministry of Fisheries, the Ministry of Coastal Affairs and the Ministry of the Environment (NPD 2015).

The NDP is an independent technocratic agency and has a regulatory function. It reports to the MPE. Its key duty is to collect and analyse data relating to the NCS. When it was established in 1973, this was a challenging task due to its limited knowledge and resources (Engen 2009), but systematic efforts to increase its technical competence have transformed it into an independent, well-established regulatory body that monitors and controls petroleum activities in the Norwegian oil and gas sector. It is also an advisory body in the policy-making process (Engen 2009).

The Norwegian organisational model includes the national oil company (NOC), Statoil, which handles the commercial functions of the sector. It is a state-owned oil company established in 1972, with 50% participatory interest in all licences granted and a dominant role in the decision-making process. It also serves as a channel for technology transfer and economic development. Statoil has pursued the development of Norwegian industrial and technological capability through long-term research and development programmes, as well as through direct involvement in highly technological projects. It has also played a key role in the development of domestic service companies (Thurber and Istad 2010; Thurber et al. 2010b).

The Norwegian state restricted Statoil's power to a commercial function by transferring the state's holdings into the State Direct Financial Interest Agency (SDFI), which was established in 1985, eliminating its veto power over field decisions (Hunter 2014). Statoil also lost its right automatically to grant interest in all licences, in line with Article 4 of EEA agreement and EU Directive 94/22 EC, which requires objective, non-discriminatory granting of licences (Hunter 2014). Statoil was partially privatised in 2001. The Norwegian state has a 67% holding in Statoil, managed by the MPE. The major shareholders of the remaining 33% are the USA, Norwegian private owners, the rest of Europe, the UK, and the rest of the world (Statoil 2015).

The Norwegian state participates in production licences through a fully state-owned, non-operational company called Petoro. In addition to its commercial interest as a licensee, it regulates petroleum activities as a member of management committees in the field (Hunter 2014).

In summary, the primary goal of Norwegian petroleum governance has been to gain comprehensive state control over the petroleum industry; therefore, the NOC helped build domestic expertise through learning by doing. In this context, Statoil became a global competitive oil company. Norway's institutional design, which separates the different roles within the petroleum sector, has played a key role in increasing the checks and balances and avoiding conflicts of interest.

4.2.2 Kuwait

Oil production started in Kuwait in 1965. The country has a population of less than four million and has the fifth largest conventional oil reserves in the world. It is a small economy, with proven crude oil reserves of about 101.5 billion barrels and proven natural gas reserves of about 1.9 trillion m^3 at the end of 2014. Petroleum exports account for about 94% of total exports. Thus, its economy is heavily reliant on petroleum rents (EIA 2014b; BP 2015).

Kuwait's oil exports started in 1946 and it is now a major oil-exporting country. It is one of the few OPEC members with spare capacity, which is used to compensate when there is a shortage of supply in the world market. For example, it increased oil production in response to the loss of Libyan supplies in 2011 (EIA 2014b; BP 2015).

Production capacity is growing following a collapse in production resulting from the invasion of Kuwait by Iraq in 1990. The major customers for Kuwaiti oil are the United States, Europe, South Korea and India. As shown in Fig. 4.5, the proportion of domestic oil consumption is small: most of its production is available for export. However, the consumption of crude oil has been steadily increasing owing to the use of oil by power plants for electricity generation and by domestic refineries (EIA 2014b).

Kuwait has tended to develop its natural gas sector by attracting international oil companies to invest in the exploration and production of natural gas. Increasing domestic demand for natural gas and oil is attributable to the high consumption of combined power and water desalination plants. A subsidisation policy plays a major role in keeping electricity prices low, resulting in inefficient use. Therefore, in recent years the Kuwaiti government has stepped up efforts to increase its supply of natural gas to the domestic market. Kuwait's refinery sector grew during 2014, with a production capacity of 936 barrels per day, and Kuwait exports petroleum products to various global markets (EIA 2014b).

Kuwait is dependent on imported natural gas on account of its small natural gas production, which is unable to meet domestic demand (see Fig. 4.6).

Current fiscal policy for the petroleum sector is based on technical services agreements (TSAs). The Kuwaiti Constitution limits the involvement of international oil companies (IOCs) to the operation of local fields. TSAs provide a fixed rate of return on investment. Under such agreements, IOCs cannot acquire any interest in the underlying resource (Stevens 2008). Following nationalisation of Kuwait's petroleum industry in 1977, the entire oil and gas sector was brought under the control of the Supreme Petroleum Council (SPC), which is headed by the prime minister. The council is charged with setting government policy on petroleum wealth. However, it lacks the capability to address issues facing the Kuwait Petroleum Corporation (KPC), and hence has been unable to develop an effective strategy for the oil and gas sector. SPC is not accountable to parliament because the emir, rather than the parliament, appoints the government's cabinet. A lack of trust

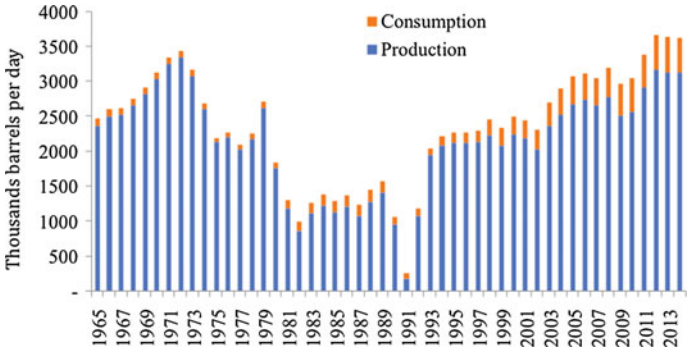

Fig. 4.5 Kuwait's crude oil production and consumption, 1965–2014. *Source* BP (2015)

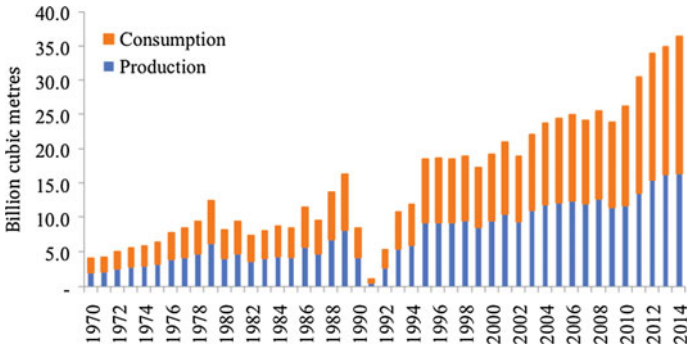

Fig. 4.6 Kuwait's natural gas production and consumption, 1970–2014. *Source* BP (2015)

between parliament and government has resulted in obstacles being set up by parliament to protect natural resources (Stevens 2008).

The Ministry of Oil is responsible for policy making and regulating the KPC. The Minister of Oil is the chair of KPC; thus, it is under the direct control of the Ministry, and has the power of veto over all KPC decisions. Consequently, the KPC seems not to be an independent entity in managing petroleum activities. The board of KPC comprises all directors of its subsidiaries. KPC is a fully state-owned company responsible for all petroleum activities. In 1980, the organisational structure of the petroleum sector was changed and KPC began to bring all related state-owned entities under a single umbrella, as shown in Fig. 4.7. KPC is accountable to its shareholder (the SPC) as well as parliament. It has faced difficulties in controlling its subsidiaries and implementing its projects effectively, a burden stemming from poor cooperation between the various subsidiaries and KPC,

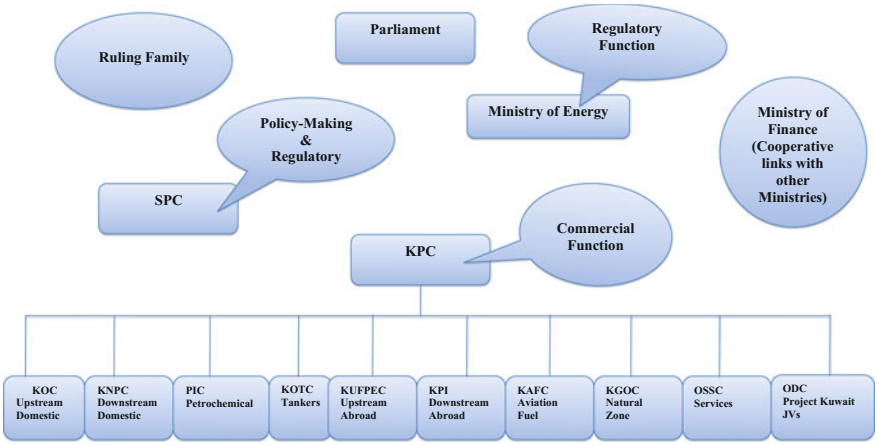

Fig. 4.7 Organisational structure of Kuwait's petroleum sector. *Source* Based on data from World Bank (2007), Stevens (2008)

long hierarchical and bureaucratic decision-making processes, political and elite interference, and low technical skills (World Bank 2007; Stevens 2008).

Authority over the oil sector is fragmented. Governance of the oil and gas sector lacks clarity of goals, roles and responsibilities between the agencies involved in the sector, as illustrated in Fig. 4.7. Moreover, in practice, there is no regulatory agency in the Kuwaiti oil and gas sector; thus, both the Ministry of Oil and PSC supervise KPC (Stevens 2008).

4.2.3 Azerbaijan

Azerbaijan is one of the world's oldest oil-producing countries. It is located in the South Caspian Sea basin with a population of more than nine million people. Since becoming independent from the Soviet Union in 1991, Azerbaijan's economy has relied heavily on its vast deepwater, offshore oil and gas resources in the Caspian Sea (EIA 2014c). British Petroleum (BP 2015) estimated Azerbaijan's crude oil and natural gas reserves at the end of 2014 to be 7.0 billion barrels and 1.2 trillion m^3, respectively. Crude oil exports account for 93% of total merchandise exports (World Bank 2015a).

As illustrated in Fig. 4.8, oil production in Azerbaijan grew from 307,000 barrels per day (bpd) in 2002 to 1.0 million bpd in 2010. However, the production volume has since declined, falling to 919,000 bpd in 2011 and 848,000 bpd in 2014. Falling production has contributed to technical problems in the Azeri-Chirag-Guneshi (ACG) field, which is Azerbaijan's main production field. Crude oil is exported through pipeline, truck and rail to world markets (EIA 2014c).

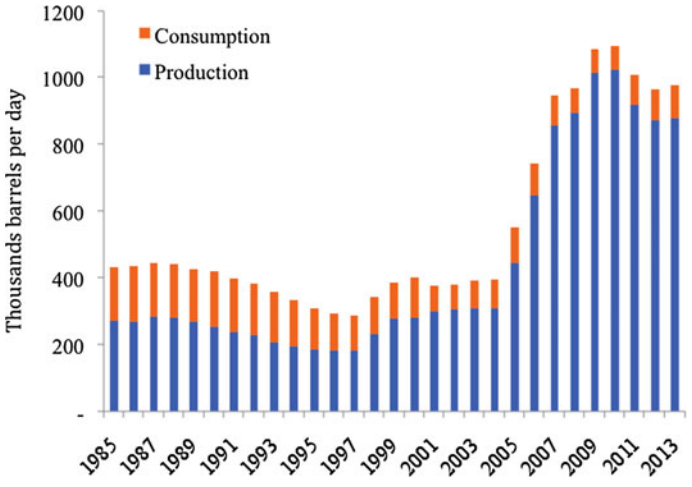

Fig. 4.8 Azerbaijan's crude oil production and consumption, 1985–2014. *Source* BP (2015)

Since 2007, natural gas production has increased with the commencement of production in the Shah Deniz field, developed by BP. Figure 4.9 also shows an increase in the consumption of natural gas, which is a major domestic energy source. The plan is that natural gas will be used for the country's future power generation. At present, the major natural gas customers are Turkey and Greece (EIA 2014c). Turkey is the major importer of Azerbaijani natural gas, and natural gas to Greece is transported through Turkey. However, under the 2011 Izmir agreement, Azerbaijan exports natural gas directly to Europe through Turkish territory. Azerbaijan has two refineries with a combined production capacity of 399,000 bpd as of 2014. The refineries need to be modernised to increase production (EIA 2014c).

In Azerbaijan, the fiscal regime is a contractual system. Under production sharing agreements (PSAs), Azerbaijan allows IOCs to invest in the oil and gas sector. The President of the Republic approves the rules for negotiations and contracts with IOCs, and the State Oil Company of the Azerbaijan Republic (SOCAR) is involved in the negotiation process. SOCAR has its own share in all contracts. At the same time, it acts as a government representative in contracts. This dual role results in conflicts of interest. Furthermore, SOCAR plays a major role in setting policy on petroleum resources as a result of its close cooperation with the president. It has a dominant role in the oil and gas industry, and thus it manages and regulates all petroleum activities. The role of the Ministry of Fuel and Energy is very limited (EIA 2014c; Energy Charter Secretariat 2011; Kjaernet 2010; Gojayev 2010).

In short, Azerbaijan has NOC-dominated governance model for its oil and gas sector. The NOC, namely SOCAR, has multiple responsibilities and functions, including policy-making, regulatory and commercial (see Fig. 4.10).

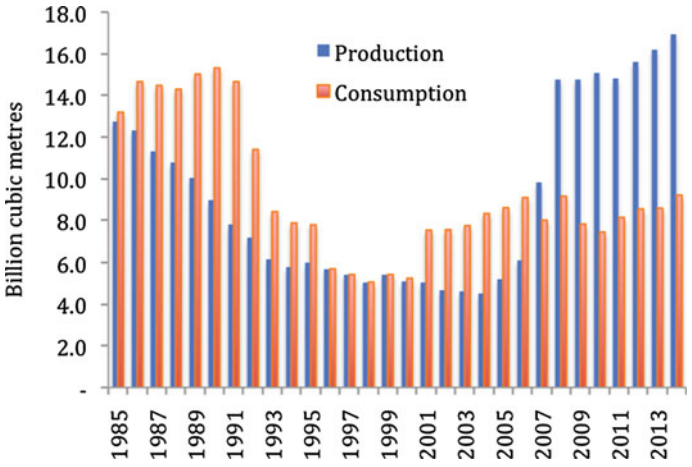

Fig. 4.9 Azerbaijan's natural gas production and consumption, 1985–2014. *Source* BP (2015)

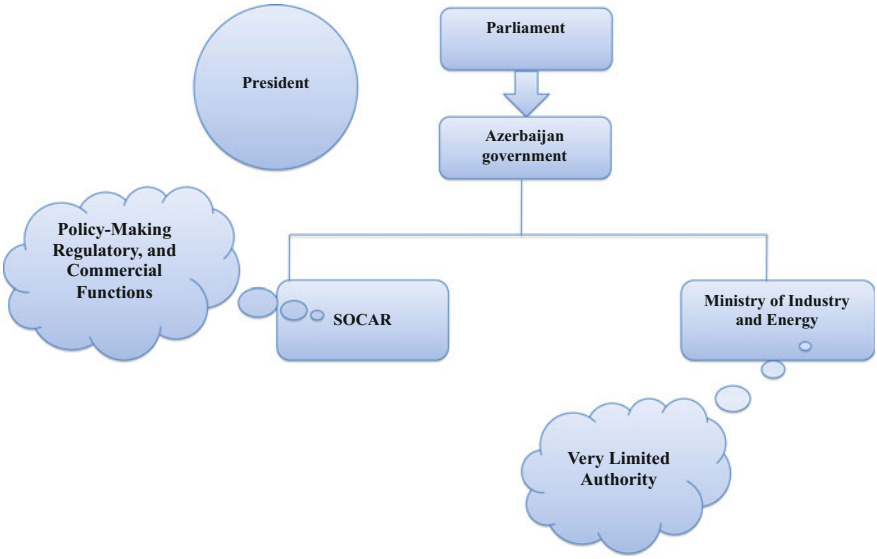

Fig. 4.10 Organisational structure of Azerbaijan's petroleum sector. *Source* Author, based on data from EIA (2014c), Energy Charter Secretariat (2011), Kjaernet (2010)

4.2.4 Nigeria

Nigeria is rich in oil and gas. It is located on the Gulf of Guinea on Africa's western coast, and has a population of 172 million. Nigeria is a member of the Organization of the Petroleum Exporting Countries (OPEC), and petroleum exports account for 88% of total national exports (OPEC 2014). Nigeria's petroleum reserve was estimated to be 37.1 thousand million barrels of crude oil and 5.1 trillion m^3 of natural gas at the end of 2014 (BP 2015).

Crude oil production reached a peak of 2.4 million bpd in 2005. As shown in Fig. 4.11, its oil production suffers from significant volatility, stemming from social conflicts resulting in attacks on oil pipelines and related infrastructure. Nigeria is a major crude oil exporter to the United States; however, the volume of exports to the US has been falling due to a growth in shale oil production. The refinery sector accounts for the largest share of domestic consumption, but capacity cannot meet local demand and Nigeria has to import oil products (EIA 2014d).

Nigeria's natural gas production capacity has been growing gradually since 2003 and reached a peak of 12.28 billion m^3 in 2008 (see Fig. 4.12), but this has been declining due to the same security issues threatening oil production capacity. It is the world's twenty-fifth largest natural gas producer, and the majority of its natural gas reserves are located in the Niger delta (EIA 2014d). Widespread natural gas flaring is a critical issue that the Nigerian government has failed to resolve. Despite the presence of a vast natural gas energy source, shortage of electricity remains an unresolved problem (Bloom 2010).

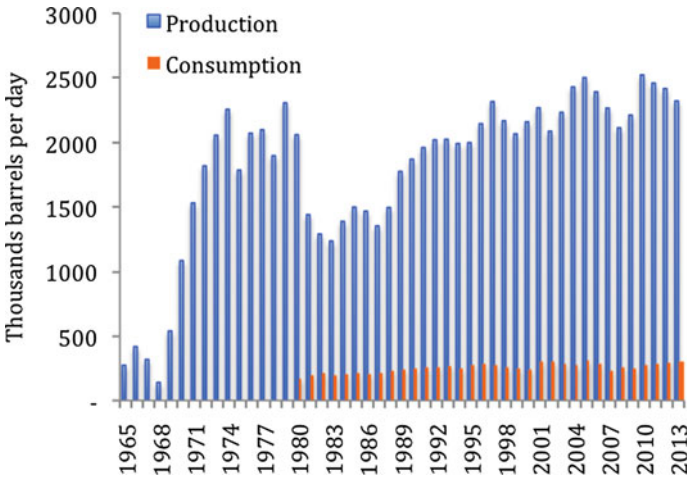

Fig. 4.11 Nigeria's crude oil production and consumption, 1965–2013. *Source* BP and EIA (2014d)

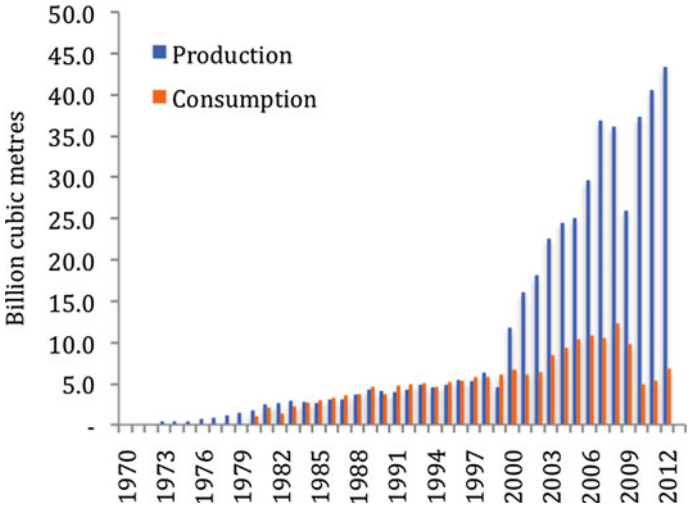

Fig. 4.12 Nigeria's natural gas production and consumption, 1965–2012. *Source* BP and EIA (2014d)

Nigeria has four refineries, which operate below full capacity because of operational failures, fires and sabotage, mainly on the crude pipelines feeding refineries. As a result, Nigeria has to import petroleum products. The government has planned for the construction of new refineries, but these have been delayed due to shortage of finance (EIA 2014d; OPEC 2014).

In view of the financial burden on the Nigerian National Petroleum Corporation (NNPC) in funding numerous joint venture operations, since the 1990s the Nigerian government has relied on production sharing agreements (PSAs) with IOCs (Thurber et al. 2010a). NNPC was created in 1977 to oversee regulation of the oil and natural gas industry. In 1988, the government divided NNPC into 12 subsidiaries, which expanded the scope of activities of NNPC in the oil and gas sector. The most significant functions of subsidiaries of NNPC include control over international companies operating in Nigeria, buying and selling crude oil and refined petroleum products, upstream and downstream operations, gas transportation and service activities (NNPC 2015; Thurber et al. 2010a).

The Federal Ministry of Petroleum Resources (FMPR) is responsible for initiating policies for the oil and gas sector, and supervises the implementation of approval policies. It is organised into a number of departments and agencies, as illustrated in Fig. 4.13. The Department of Petroleum Resources (DPR), within the FMPR, is the key regulator responsible for processing all applications for licences, for monitoring upstream and downstream activities, and for all rent payments in the oil and gas sector (NNPC 2015; Thurber et al. 2010a).

In summary, the governance model of the oil and gas sector in Nigeria has an overlapping institutional framework in which various agencies are involved. This results in duplications and conflicting regulatory functions.

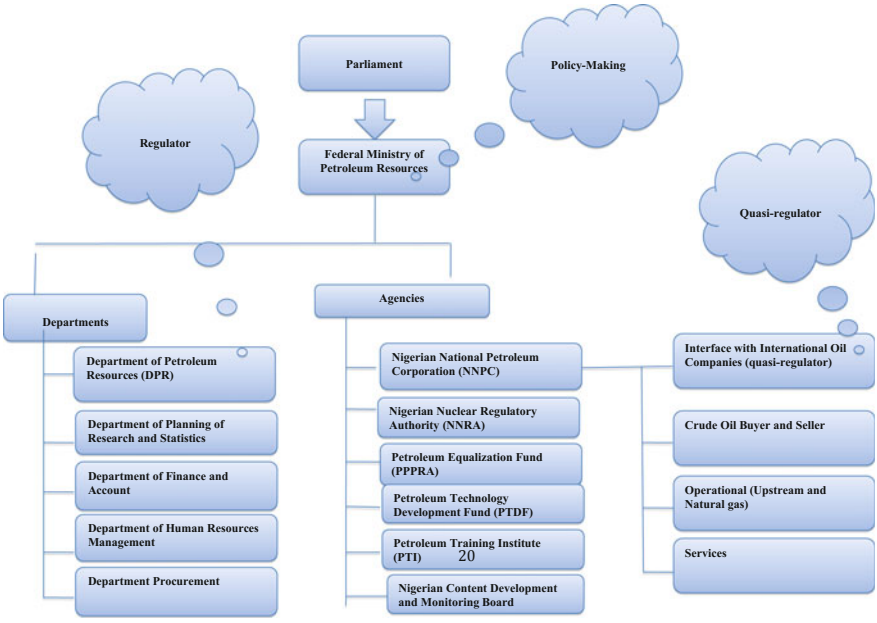

Fig. 4.13 Organisational structure of Nigeria's petroleum sector. *Source* Based on data from FMPR (2015), NNPC (2015), Thurber et al. (2010a)

4.3 Capacity-Building Policy: Role of Human Resource Development in Petroleum-Exporting Countries

Building capacity is a major determinant of the effective and efficient management of natural resources, particularly with regard to petroleum wealth. The shortage of local administrative and technical know-how, as well as new knowledge and technology, restricts the contribution of an indigenous labour force to industrial activities (ILO 2012; Marcel 2015). Support for education and training policies to build the right skills may contribute to economic prosperity through the improvement of productivity and growth. It contributes to social cohesion by increasing employment in good quality jobs and social engagement (OECD 2014). This section considers human capacity-building policies across the four cases.

4.3.1 Norway

The Norwegian government's policy for the oil and gas sector pursues the development of local capacity to maximise participation in exploration and development of the petroleum industry (Tordo et al. 2013). The establishment of a state-owned company stemmed from the need for an appropriate tool to implement national petroleum policy and also to fulfil the ambition of localising petroleum-related activities in order to increase national control over the country's oil and gas industry. Norway's advanced technological capacity in its shipbuilding industry facilitated the development of local engagement in the petroleum sector, which is located offshore (Wolf and Pollitt 2009; Heum 2008).

The MPE sought to enhance the technical capability and competiveness of NPD by providing incentives to attract adequate technical expertise (Thurber and Istad 2010). The MPE has also established various research programmes and partnerships covering a wide range of activities relating to employment creation, engagement of society in the petroleum industry, expansion of business markets, and building links with other industries (NPD 2015).

The Norwegian government's expenditure on education and training is 9% of GDP, which is the highest of all OECD countries (OECD 2014). With a vast fund for education and training purposes, the government aims to design a better-performing skills system in cooperation with employers, trade unions, universities, students and teachers. Furthermore, Norway's expenditure of GDP on research and development (R&D) is 1.61% of GDP. In addition to financial support, foreign companies operating on the NCS are committed to conducting at least 50% of research activities related to the development of fields in Norwegian institutions (Leskinen et al. 2012).

In summary, capacity building forms the key policy for the development of Norway's oil and gas sector.

4.3.2 Kuwait

Education expenditure accounts for 9% of Kuwait's GDP. However, the poor quality of the education and training system has led to a shortage of competent labour in Kuwait (IMF 2013). Kuwait has one of the lowest levels of expenditure on R&D among Gulf states, and there is no effective link between universities and industry (IMF 2014a).

Kuwaitis are employed mainly in the public sector. High pay and benefits for public jobs reduce incentives to work in the private sector, a classic problem in the "rentier states" of the Gulf (Gelb et al. 2002). The attractiveness of public employment also limits the number of workers engaging in entrepreneurship and skills training programmes to match their competence with the tradable labour market. Therefore, Kuwait suffers from a lack of specialised indigenous skills in the industrial sector (IMF 2013), a problem exacerbated by the small size of its population.

In addition, the lack of highly skilled workers is reflected in weak middle-level management across KPC's subsidiaries. The lack of managers with a deep knowledge of the oil industry stems from political interference in the recruitment process and the failure of KPC to devise a system that identifies training needs and promotes the most talented employees (Victor et al. 2011).

In short, the human resource capacity-building policy with respect to Kuwait's oil and gas sector has not been successful in educating and training the manpower to perform creditably the functions required by the petroleum industry.

4.3.3 Azerbaijan

There is growing concern about a decline in the number of participants in higher education institutions and the vocational training sector in Azerbaijan (Allahveranov and Huseynov 2013). Another factor that plays a major role in increasing the unemployment rate is a noticeable mismatch between the skills supplied by the educational system and labour market demands. Consequently, shortage of skills remains a significant barrier to productivity increases (Allahveranov and Huseynov 2013). In response, the government has adopted a range of measures to develop this capacity, such as introducing new curricula in academic institutions, new bachelor and master's programmes, and the establishment of new training centres (World Bank 2015a).

The Azerbaijani government uses local content rules in PSAs with foreign companies to develop its workforce through employment and training. These local content rules also target the development and procurement of local supplies and services. However, the effective implementation of regulations calling for local skills and suppliers is dependent on the quality and quantity of the domestic workforce and manufacturing companies (Tordo et al. 2013).

Human capacity-building for Azerbaijan's oil and gas industry faces many challenges, such as funding limitations and the low quality of the education system and training programmes.

4.3.4 Nigeria

The low skills of college graduates in Nigeria reflect the poor quality of the education system (Anyaehie and Areji 2015). This can be explained by a low level of public capital spending on human capacity development. Public funding of education and R&D is inadequate to meet the needs for development of the education system. The share of education spending in the 2013 budget was 8.5% (Barungi 2014). Consequently, the inadequacy of funding in education and training has a negative effect on economic development, thereby reducing living standards and welfare in Nigeria (Omoijmite 2011).

The local content policy introduced to develop a petroleum-competent Nigerian workforce started in 1971. In compliance with the Oil and Gas Industry Content Development Act of 2010, foreign petroleum companies in Nigeria must support the skills acquisition and empowerment of Nigeria's workforce and the enhancement of its existing manpower capacity. The local content rule also aims at effective involvement of Nigerian companies in the service and supply side of the oil and gas sector (Tordo et al. 2013).

The NNPC has established a Nigerian content development strategy investing in human capacity building. It awards joint venture agreements as a prime vehicle for the development of a range of skills in different disciplines, including engineering, geology and geophysics. However, achievement of the second objective of the content development strategy associated with enhancing the active participation of indigenous service companies in oil and gas activities is facing obstacles owing to poor fiscal policy and inadequate infrastructure (Balouga 2012).

The Nigerian government has set up a separate authority called the Nigerian Content Development and Monitoring Board that has responsibility for local content management. The Petroleum Technology Development Fund (PTDF) was established to develop domestic manpower for the oil and gas industry through training and education. For example, in order to fill the skills gap, overseas scholarships are granted to increase the number of master's and doctoral degree holders in several scientific disciplines related to the oil and gas industry (PTDF 2015).

The ineffective local capacity-building policy has resulted in an acute local skills shortage and a dearth in the competent technical manpower required by the oil and gas industry.

4.4 Economic Policy: To Maintain Macroeconomic Sustainability and Long-Term Economic Development

In the wake of the recent sharp fall in oil prices, as discussed in Chap. 2, economic growth and macroeconomic stability are big challenges facing oil-centred economies. According to the research reviewed in Chap. 2 and the results of Chap. 3, the uncertain and volatile nature of oil revenues, when they are the dominant source of government income, has a significant impact on inflation and the account balance in oil exporting countries and often delays sustainable growth of the non-oil economy. Stevens et al. (2015) emphasises the importance of an effective fiscal policy in response to unstable oil revenues in the major petroleum exporters. He argues that the more successful oil-exporting nations insulate their economy from fluctuating oil prices through the establishment of revenue stabilisation or savings funds. These well designed petroleum funds allow petroleum-exporting countries to manage their hydrocarbon revenues efficiently in order to stimulate long-term economic growth.

This section focuses on the fourth pillar of the extractive value chain, namely revenue management and long-term economic growth. The problems facing petroleum revenue management are two-fold. First, there is the question of large and unpredictable swings in oil prices, which make oil revenues uncertain. The second problem is associated with high dependence on the petroleum sector, which plays a dominant economic role in terms of generating national income. Therefore, it is important to analyse the economic policies and mechanisms that the four countries have undertaken to create a buffer against economically damaging oil shocks. It is also important to assess how they have formulated economic policies to ensure the diversification of the national income portfolio, and thus sustainable economic development in the post-petroleum era.

4.4.1 Norway

In the most successful petroleum-exporting countries such as Norway, the establishment of a sovereign wealth fund as a fiscal policy instrument serves both as a buffer for fluctuations in government revenues, and as a long-term investment. The Norwegian "Petroleum Fund" was set up in 1990 and was renamed the "Government Pension Fund" in 2006. The fund absorbs surpluses of petroleum revenues and pursues four objectives: (1) to shield the Norwegian economy from overheating and "Dutch disease"; (2) to save revenues for future generations; (3) to provide a fiscal buffer for "rainy days"; and (4) to ensure that physical oil and gas assets are gradually transferred into financial assets to replace oil and gas income as a source of state revenue (Ovesen 2008; Fearnley 2012).

The fund is integrated into the government budget, which means all spending and allocation should happen through the normal budget. A fundamental principle of Norwegian fiscal policy is a budgetary rule that restricts government spending to

4% of the balance of the fund over the course of an annual business cycle. Norges Bank manages the fund, and the Ministry of Finance sets the investment policy and the broad allocation of assets. Transfers from the fund require parliamentary approval (Humphreys et al. 2007).

The Government Pension Fund is divided into two parts: the Government Pension Fund Global (GPFG), which is invested abroad, and the Government Pension Fund Norway, invested in Norway. The GPFG holds 60% of its assets in equities, 35–40% in fixed income and as much as 5% in real estate. Its investments are spread globally outside Norway (Ovesen 2008; Fearnley 2012).

In addition to revenue management measures, Norwegian economic policies aim to reduce dependence on oil and gas revenues, thereby promoting Norway's long-term economic health and stability. Leskinen et al. (2012) highlight that the Norwegian local content policy aims for greater engagement of local service companies in the oil and gas sector. To achieve this goal, oil companies are obliged by law to provide the Ministry with a list of bidders. The Ministry is able to change the decision in favour of local companies if they are technically competitive. In this way, the Norwegian government plays an active role in ensuring that contracts are awarded to local companies by operators working in the Norwegian oil and gas sector. Heum (2008) explains another local content support mechanism adopted by the Norwegian government to enhance the quality of local suppliers through learning by doing: the government offers tax incentives to support foreign oil and gas companies working in local development programmes. Furthermore, the government aspires to make the Norwegian oil and gas industry globally competitive and able to contribute to economic growth, even if the domestic petroleum industry stagnates (Heum 2008). In addition, joint venture contracts between domestic and leading foreign companies have facilitated the transfer of technology, knowledge and expertise.

In this context, non-oil activities increased over the period 2000–2011; however, much of this growth was actually related to oil and gas production (IMF 2013). As shown in Fig. 4.14, oil rents fluctuated over the period 2000–2012 due to a gradual decline in petroleum production as a result of ageing oil fields. Since 2010, Norway's GDP has continued to grow despite a downward trend in oil and gas revenues. Thus, it can be concluded that Norway's dependence on the sale of hydrocarbons has not increased, owing to the presence of other productive sectors in its economic system such as the service sector, which contributes about 53% to GDP (Leskinen et al. 2012).

Since June 2014, the crude oil price has fallen by more than 50%, declining from over US$100 per barrel in January 2014 to around US$40 per barrel during the second part of 2015, the lowest since the bottom of the 2009 recession. This has reduced the return on investments associated with the Norwegian wealth fund, which stood at US$882 billion as of June 2015 (SWFI 2015b). The current decline in oil prices has increased unemployment in Norway, as the petroleum industry has reduced spending by laying off 10% of the sector's total workforce (Hovland 2014). Moreover, Statoil now has an international portfolio and is behaving more like an IOC in seeking cost cuts in the current low-price environment: "… Statoil needs an

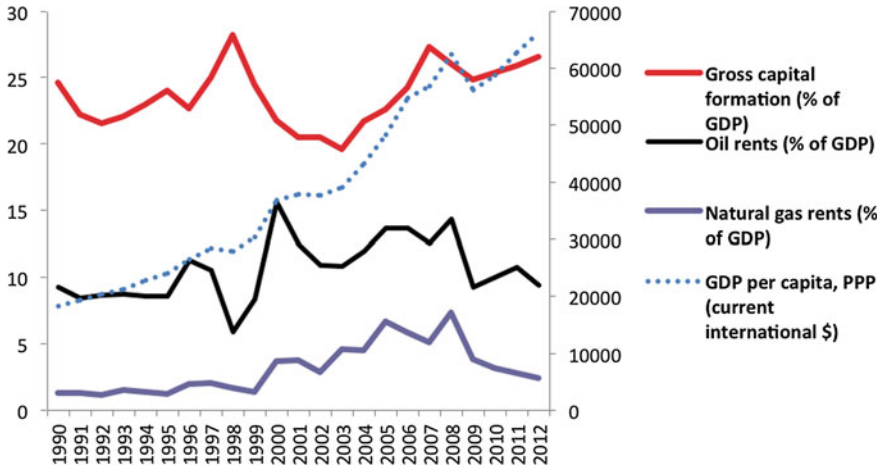

Fig. 4.14 Norway's economic indicators. *Source* World Indicator Development, World Bank (2015b). *Note* GDP per capita on the *right axis*; oil rents, natural gas rents, and gross capital formation on the *left axis*

oil price of between US$115 and US$120 this year to be able to pay its dividend without raising new debt" (Adams 2015).

In short, the Norwegian government's prudent oil investment policy has resulted in a decline in its economic dependence on the oil and gas industry. Oil rents have been used to diversify the Norwegian economy; however, the oil-based sectors are still subject to a downturn in oil prices.

4.4.2 Kuwait

In order to manage petroleum revenues, in 1953 Kuwait was the first country in the world to establish a sovereign wealth fund. The Kuwait Investment Authority (KIA) was established in 1982 and is now responsible for Kuwait's state assets. KIA manages two funds: the General Reserve Fund (GRF) and the Future Generations Fund (FGF). GRF was established in 1960 and is the main treasury for the state. All revenues, including petroleum rents, are transferred into GRF and all national expenditures are paid out of this fund. FGF was created in 1976 through a transfer of 50% of GRF's assets at that time. 10% of state revenues are now allocated to GRF annually. GRF's money is invested in assets, including bonds and cash asset classes, outside Kuwait. The purpose of KIA is to build up sufficient assets, and in turn achieve a long-term return on investment (KIA 2015).

The Kuwaiti government uses a range of means to distribute its oil rents. The major redistribution mechanisms of petroleum revenues include the following: (1) domestic investment in infrastructure and economic diversification programmes;

(2) land purchases and their sale at low prices to the public; (3) public transfer payments to Kuwaiti nationals and businesses; (4) subsidies, for example on electricity, water, food and housing; (5) public employment with well-paid salaries and benefit packages (91% of the Kuwaiti national labour force works in the public sector); (6) interventions in the private sector, including the provision of public infrastructure and services, with the exception of personal or corporate income tax; (7) regulation of Kuwait's FDI environment; and (8) involvement of Kuwaiti nationals in business by requiring foreign investors to sponsor them (El-Katiri et al. 2011).

In addition, Kuwait's economic policies pursue the goal of economic diversification through the establishment of a small and medium-sized enterprise fund to support industrial activities. 40% of industrial establishments supported by this fund are in trade, hotels and restaurants, and 33% are in construction and industry (IMF 2014a). The other major diversification is in the oil and gas sector, using crude oil and gas outputs to produce downstream products such as petrochemicals, fertilizers and chemicals, transport and logistics. Thus, Kuwait garners more value added from its endowments (Brinkley et al. 2012; El-Katiri et al. 2011).

Despite all these policies, Kuwait's economy is still overly-dependent on petroleum rents; hence, economic growth is subject to fluctuations in the global price of oil. As shown in Fig. 4.15, oil returns contribute more than 50% of GDP; therefore, a sustained decline in oil prices, and in turn oil rents, delivers a large, negative shock to the economy (Van der Ploeg and Poelhekke 2009). Furthermore, fiscal policy in terms of investment spending seems to be rather "procyclical" (IMF 2012) in Kuwait: investment expenditure increases after a positive rent shock and declines after adverse shocks in oil rents.

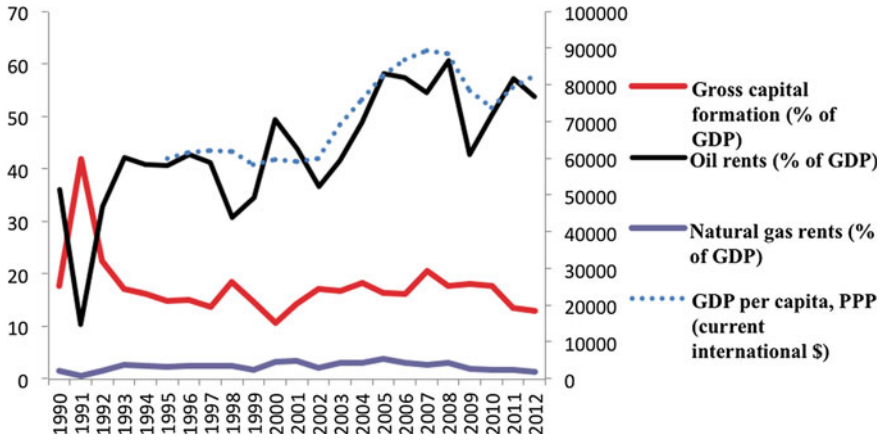

Fig. 4.15 Kuwait's economic indicators. *Source* World Indicator Development, World Bank (2015b). *Note* GDP per capita on the *right axis*; oil rents, natural gas rents, and gross capital formation on the *left axis*

The dramatic fall in oil prices has forced the Kuwaiti government to cut current spending. Restriction of subsidies, which continues at over 8–5% of total expenditure, has been the main fiscal policy response to the dramatic drop in current oil prices in Kuwait. However, it will not reduce capital spending on projects (Fattahova 2015). In addition, the large drop in oil prices has led to a government budget deficit. Consequently, the Kuwaiti state needs to balance its budget, which is based on oil valued at US$45 per barrel in 2015, down from its previous estimate of US$75 (Reuters 2015). The Kuwaiti sovereign wealth fund creates a buffer against the negative impact of oil price volatility, and Kuwait's petroleum fund is one of the largest in the world, valued at US$592 billion in June 2015 (SWFI 2015a).

4.4.3 Azerbaijan

The State Oil Fund of the Azerbaijan Republic (SOFAR) was established in 1999. The fund aims at macroeconomic stabilisation by smoothing public expenditure and growing non-oil sectors of the economy. It was set up to save revenues for the benefit of future generations. SOFAR is a legal entity managed by the Supervisory Council, and its membership is approved by the President of the Republic (SOFAR website 2014). The Azerbaijani sovereign wealth fund has been invested in a range of areas, such as real estate and gold (CESD 2012). SOFAR currently has US$37.3 billion in reserves (SWFI 2015a). Azerbaijan's high foreign exchange reserves serve as a buffer against oil price shocks.

The Azerbaijani government has sought to diversify its economy by setting priorities for budgetary expenditure in education, infrastructure and the development of non-oil sectors, but its economy still relies on the hydrocarbon sector. According to the Central Bank of Azerbaijan, the country's GDP growth in 2012 was driven entirely by public spending in non-oil sectors. Economic reform focuses on supporting small and medium-sized business establishments, developing the region and opening up the economy to private capital investment.

Azerbaijan's budget has become heavily dependent on petroleum revenues. The oil and gas industry provides more than half of the country's GDP, as shown in Fig. 4.16. Since 2003, annual GDP per capita rose as a result of increased oil and gas production, as did the value of exports because of the increase in oil prices. However, oil prices trended upward in 2011 and 2012, with the share of oil rents in GDP fluctuating because of a decline in oil production as a result of technical problems in the Azeri-Chirag-Guneshi (ACG) field. This decline in oil rents was not reflected in the GDP per capita due to growing public investment expenditure. This supports the evidence of Chap. 3 showing a decline in the impact of petroleum rents on economic growth due to increasing investment in non-oil projects.

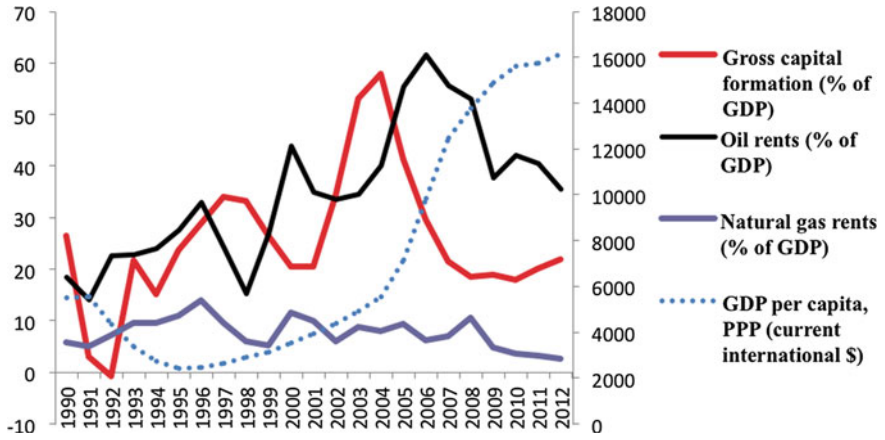

Fig. 4.16 Azerbaijan's economic indicators. *Source* World Indicator Development, World Bank (2015b). *Note* GDP per capita on the *right axis*; oil rents, natural gas rents, and gross capital formation on the *left axis*

The decline in oil prices in 2014 resulted in a big loss of budget revenue, and thus reduced the inflow of oil revenues into the State Oil Fund of the Republic of Azerbaijan (SOFAZ), which is the main source of transfers to the state budget. Transfers from SOFAZ into the state budget increased seven-fold over the period 2003–2013 (CESD 2012). In the wake of the oil price drop, increases in production volumes have been unable to limit losses in revenue for SOFAZ. Consequently, the Azerbaijani government has balanced its 2015 budget by setting the price of oil at US$90 per barrel, down from US$100 in 2014. In addition, low oil prices may lead to negative social consequences in terms of increased unemployment, as SOCAR and BP have reduced their costs by cutting 8% of their workforce (Farchy 2015).

4.4.4 Nigeria

In recent years, Nigeria has taken several initiatives to set up a sovereign wealth fund. The first fund, the Excess Crude Account (ECA), was established in 2004 and aims to save surplus oil revenues according to a conservative benchmark oil price, thereby insulating the budget and the economy from fluctuating oil prices. The second fund is the Nigeria Sovereign Investment Authority (NSIA), established in 2011 following parliamentary approval. This fund serves as an instrument to support sustainable development strategies and thus long-term economic growth (Brown et al. 2014).

NSIA is divided into three further funds based on its multiple policy objectives: the Nigeria Infrastructure Fund, the Stabilisation Fund, and the Future Generation Fund (NSIA website 2015). The Finance Ministry is responsible for overseeing these accounts. Most of the excess oil revenues allocated to the ECA have already been used (Wallis 2014), and it has US$2 billion in 2015 (IMF 2015).

While oil prices have become increasingly volatile since the 2000s, oil rents as a percentage of GDP have also fluctuated over the same period (see Fig. 4.17) due to production disruptions and the activities of crude oil thieves and oil pipeline vandals, as explained earlier. Nevertheless, GDP per capita has been growing, owing mainly to the continuing positive performance of non-oil sectors, primarily agriculture, services and trade (IMF 2014b). Furthermore, Fig. 5.1 indicates that investment spending has risen over the period 2008–2011.

This upward trend in GDP per capita suggests that increasing investment in non-oil projects is an important factor in reducing the negative impact of oil rents on economic growth. This finding again supports the results of Chap. 3. Furthermore, the Nigerian government tend to promote manufacturing sector by encouraging small and medium scale enterprises, which can play a major role in creation job opportunities, skill development and poverty alleviation (Aigboduwa and Oismaoje 2013).

In the wake of the recent fall in oil prices, the Nigerian government has revised its 2015 state budget based on an oil price of US$65 per barrel, rather than the previous assumption of US$77.5 per barrel (Hou et al. 2015). In addition, the Nigerian government intends to double its value added tax income, reduce public investment expenditure by delaying or cancelling projects (Mcgrorarty et al. 2015), and reduce fuel subsidies (Hou et al. 2015).

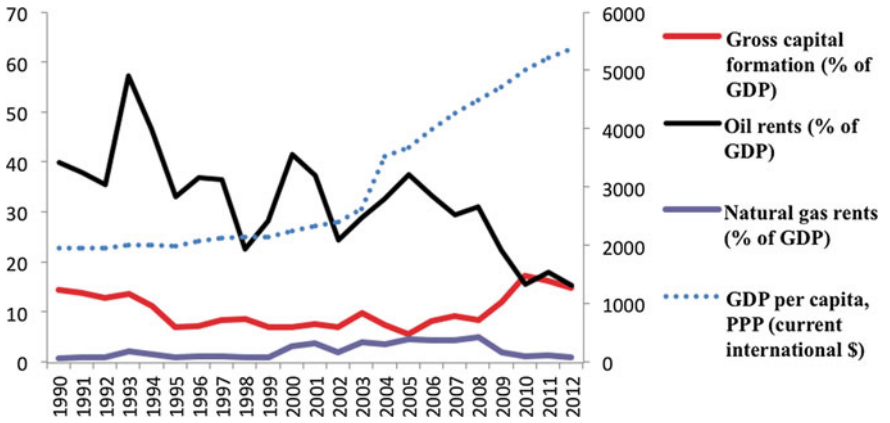

Fig. 4.17 Nigeria's economic indicators. *Source* World Indicator Development, World Bank (2015b). *Note* GDP per capita on the *right axis*; oil rents, natural gas rents, and gross capital formation on the *left axis*

4.5 Assessment

The previous sections have discussed the various policies adopted with respect to petroleum resource management in Norway, Kuwait, Azerbaijan and Nigeria. This section presents a comparative analysis of the institutional design, human resource capacity development, and revenue management policy frameworks implemented by the four petroleum-producing countries in order to identify best practice.

Table 4.1 provides a comparison of the four variables used in revenue management policy between the case studies. Moreover, it indicates that the fuel rent share is negatively associated with gross capital formation. It also shows that the countries with the oil sector as a dominant economic sector have spent less of their oil revenues on capital investment.

4.5.1 Institutional Design

With regard to the institutional design of petroleum sector governance, Norway has opted for an oil institution model based on a separation of powers between the

Table 4.1 Descriptive Statistics

	Mean	Standard deviation	GDP per worker	Gross capital formation	Oil rent	Natural gas rent
Norway						
GDP per worker	39,156.42	16,020.35	1			
Gross capital formation	23.65	2.30	0.41	1		
Oil rent	10.58	2.35	0.48	−0.21	1	
Natural gas rent	3.13	1.86	0.69	0.02	0.80	1
Kuwait						
GDP per worker	71,580.57	11,477.66	1			
Gross capital formation	17.45	5.89	0.42	1		
Oil rent	43.74	11.31	0.83	−0.01	1	
Natural gas rent	2.29	0.77	0.06	0.06	0.25	1
Azerbaijan						
GDP per worker	7093.03	5006.58	1			
Gross capital formation	25.69	13.29	−0.18	1		
Oil rent	34.78	13.20	0.55	0.24	1	
Natural gas rent	7.74	2.95	−0.60	0.17	0.06	1
Nigeria						
GDP per worker	3057.83	1240.90	1			
Gross capital formation	10.218	3.45	0.36	1		
Oil rent	32.28	9.95	−0.67	−0.23	1	
Natural gas rent	2.29	1.46	0.30	−0.46	0.14	1

NOC, which is engaged in commercial hydrocarbon operations, the regulatory body, which provides oversight and technical expertise, and the government ministry, which helps set policy.

Statoil has sought to enhance its commercial competiveness and operational performance, thereby increasing its financial returns to the state, by carrying out extensive oil and gas operations both in Norway and abroad. Furthermore, exploration and production agreements between Statoil and foreign companies are designed to increase Norwegian state control over the petroleum industry by strengthening Norwegian expertise in exploration and production.

The Norwegian Petroleum Directorate has advisory and regulatory functions, and parliament is responsible for the overall framework. These well-designed institutions are underlying factors that prevent any conflict of interest and have contributed to successful policy implementation in Norway's petroleum industry. Norway's experience with its oil institutional structure is different from that of the other cases here, with a strong emphasis on transparency and accountability.

Conversely, Kuwait's oil and gas industry lacks a clear administrative body. The parliament does not appoint the government, and only has the ability to veto rather than initiate major policy decisions; hence, many petroleum decisions have been halted by parliamentary veto. Through veto power, the oil minister, as chairman of KPC's board, monitors the extent of its control and authority. KPC suffers from inadequate authority to initiate and deliver needed political and regulatory reforms.

Taking into account the very poor state of Kuwait's economy prior to the discovery of oil and its lack of expertise in exploration, the concessionary fiscal system was the best option for its government. Following nationalisation of its petroleum wealth, the state-owned oil company took control of oil and gas activities, while the participation of foreign petroleum companies was limited to service petroleum contracts.

However, this strategy has had to change due to a pressing need for technical assistance from IOCs to work on the country's new fields. KPC lacks experienced management and has insufficient technical knowledge as a result of political and personal interference in the appointment and employment of personnel.

In Azerbaijan, the Ministry of Industry and Energy is responsible for the preparation and implementation of state policy in the oil and gas sector. In contrast to Norway and Kuwait, Azerbaijan's oil ministry plays both a policy-making and a regulatory role in the oil and gas industry. SOCAR is a state-owned oil company and acts as the commercial body of the oil and gas industry. It also has its own (state) share in all contracts and is thus a contractor.

At the same time, SOCAR represents the government in PSA contracts. As a contractor, SOCAR is interested in increasing its share in the contract; however, this might also reduce government revenues. Consequently, a conflict of interest has

come about. This has occurred partly due to a lack of adequate law and regulation over the oil industry, and partly due to the considerable power of SOCAR and its influence over the oil and gas sector (Ciarreta and Nasirov 2012).

Nigeria's oil and gas sector has an overly complicated and inefficient administrative design, resulting in the duplication of functions between NNPC and DPR. NNPC is a commercial entity, but is also a quasi-regulator with very diverse activities. Its operations are more focused on oil marketing and downstream functions. Nigeria's oil and gas sector is negatively affected by an ineffective bureaucratic system, as in the hydrocarbon sector in Kuwait and Azerbaijan.

Nigeria now uses PSAs rather than the joint venture model, which historically was the main form of agreement between NNPC and IOCs. As with Azerbaijan, the technical inability of the state-owned oil company (NNPC) and funding problems are reasons behind the use of PSAs. NNPC and SOCAR are ineffective in monitoring the operational activities of foreign oil companies; thus, contracts are weakly enforced. For example, Watts (2004) maintains that oil companies have not made serious efforts to report the results of environmental assessments of their extractive activities in Azerbaijan and Nigeria.

4.5.2 Developing Human Resource Capital

A review of the human resource capacity-building policies of the four selected countries highlights that Norway benefits from a competent labour force, thanks to its efficient, transparent and accountable governance structure and institutions. The terms of IOCs' licences make it mandatory to transfer skills and competence to Norwegian companies. Norwegian oil companies, mainly Statoil, set personnel training as a key objective. In addition to training schemes, the transfer of technology and the development of research by promoting cooperation between IOCs and Norwegian research institutions is one of the most successful aspects of Norway's hydrocarbon policy.

Unlike Norway, the other countries are suffering from the limited technical competence of their state-owned companies and a shortage of research activities in the oil and gas sector. Kuwait lacks skilled labour at competitive prices, as well as competent management. It has historically imported most of its workers, particularly those with high skills. Similarly, low human resource and limited research capacity are serious challenges faced by Azerbaijan and Nigeria. The NOCs in these three countries are very ineffective and rely on foreign companies to perform the most complex functions in their oil and gas sectors.

4.5.3 Revenue Management

In terms of revenue management, all of the countries under investigation have adopted institutional vehicles to combat the negative effects of fluctuating oil revenues. In contrast to the other cases, Norway's sovereign wealth fund has favoured policies aimed at sound oil revenue management, including: (1) a strict and precise fiscal rule that constrains transfers to the non-oil deficit budget; (2) integration into the overall fiscal framework; (3) approval of spending decisions by parliament; and (4) partial investment abroad. Norway has diversified its sources of income, partly by investing its petroleum revenues abroad in order to diversify risk and increase the expected rate of return. This diversified investment portfolio insulates the domestic economy from Dutch disease and external shocks. The non-oil tradable sectors are gradually growing; however, the greater proportion of non-oil tradable sectors is still linked to hydrocarbon industries.

Unlike Norway, the governments of Kuwait, Azerbaijan and Nigeria have been unwilling to impose fiscal rules on their respective funds. A lack of firm fiscal rules regarding inflows and outflows, as well as inadequate independent oversight, has resulted in arbitrary withdrawals of funds. In addition, oil funds have not been integrated into the state budgetary process, and powerful political and elite groups control transactions from the fund. Given this context, in contrast to Norway, transparency and accountability remain a major challenge for Kuwait, Azerbaijan and Nigeria (Bauer 2014).

One explanation for the major differences between the selected countries lies in their contrasting economic backgrounds. Since the early 1970s, Norway has had a developed and diversified economy, with a highly educated population and a good standard of living. Its economy does not rely directly on petroleum revenues. This is in contrast to Kuwait, Azerbaijan and Nigeria, which depend heavily on oil and gas rents. However, economic reforms are being introduced through increases in public capital expenditure, leading to the growth of non-oil sectors. The insufficient number and low quality of local graduates, poor infrastructure and ineffective investment regulations to attract foreign investors are major factors that have led to declining productivity and competitiveness in the petroleum and non-petroleum sectors of Kuwait, Azerbaijan and Nigeria.

A comparison between Norway's GDP per capita and those of the other three countries shows that Norway's rate seems relatively stable, while those of Kuwait, Azerbaijan and Nigeria indicate a greater correlation with the negative and positive oil price shocks of the 1990s and 2000s, as illustrated in Fig. 4.18. This implies that the high proportion of petroleum revenues contributing to GDP makes the economy vulnerable to changes in the price of the dominant commodity, on account of limited non-oil exports from Kuwait, Azerbaijan and Nigeria.

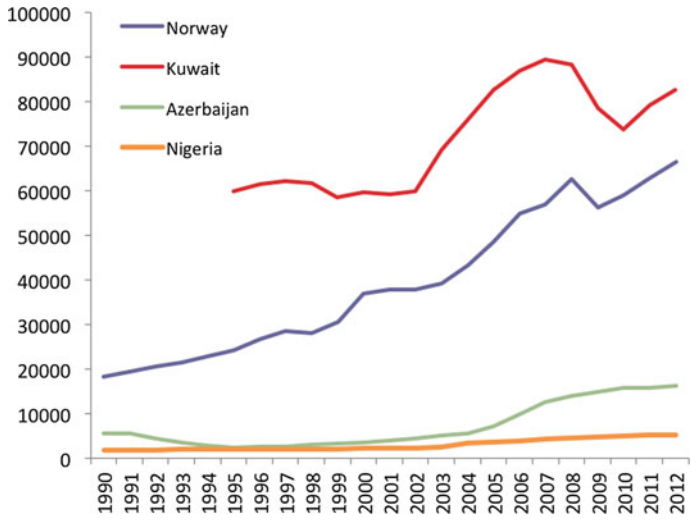

Fig. 4.18 GDP per capita (PPP, current international $), 1990–2012. *Source* World Indicator Development, World Bank (2015b)

4.6 Conclusions

This assessment of the institutional policies of the four selected petroleum exporters illustrates the importance of institutional design in the oil and gas sector as a determinant of the effective governance of the petroleum industry. The design of institutions should establish the goals, roles and responsibilities of the main stakeholders involved in the oil and gas sector. The key actors are the ministry, including an independent, highly capable regulatory agency, foreign and national oil firms, and parliament (Lahn et al. 2009). The development of such an administrative structure provides a sound business environment, reduces excessive bureaucracy and provides stability. Indeed, clarity of goals, roles and responsibilities between agencies or departments is crucial in mitigating the opportunity for patronage activities, and increases levels of transparency, accountability and checks and balances.

Analysis of policies associated with developing indigenous technological capacity shows that, with the exception of Norway, the respective governments have been unable to support local skills development, capacity building and utilisation. A lack of highly skilled manpower has served to increase technical dependence on foreign oil companies for oil and gas development in Kuwait, Azerbaijan and Nigeria. The dearth of effective policies to develop higher education systems or cooperation and links between local universities and research institutions has led to the poor performance of the domestic petroleum industries (Glyfason 2001).

The oil and gas sector is the major source of government revenue in Kuwait, Azerbaijan and Nigeria. However, all of these countries have attempted to diversify their economies through the effective allocation of oil funds to diverse capital investment areas. Kuwait's diversification policy concentrates on the expansion of horizontal links within the petroleum industry, which still rely on oil and gas, while in Azerbaijan and Nigeria public capital spending has been a driver of non-oil growth, including the construction and service sectors. An improved business environment is crucial to enabling increased private investment. There is a need for more effective public spending on infrastructure in both Azerbaijan and Nigeria. However, the creation of non-petroleum-based links still seems to be a challenge for all selected countries.

Several key lessons emerge from this comparative analysis that may be relevant to the effective governance of oil and gas in the Kurdistan region:

(1) Governments have used NOCs as a tool to achieve wider socio-economic policy objectives, such as economic diversification and raised local educational levels. However, the dual functions of NOCs, as both regulators and oil companies, may discourage IOCs from investing in the oil and gas sector. Furthermore, the regulatory function of NOCs impacts negatively on the efficiency of projects, and a potential conflict of interest emerges when an NOC acts simultaneously as a government representative and in pursuit of commercial goals. An independent NOC board may reduce political interference in the decision-making process and delays in the approval process, as well as enabling the NOC to maximise its limited technical capacity and become more transparent and accountable.
(2) A government ministry or independent entity should carry out the functions of regulation and oversight. However, the technical capability of the regulatory body is important for the effective monitoring and control of all hydrocarbon activities, thus ensuring a comprehensive follow-up of petroleum activities. The regulatory agency may also provide technical assistance to policy makers and thus act as an advisory arm.
(3) Efficient local content measures are crucial for increasing levels of productivity and competitiveness in oil- and gas-exporting countries. This key strategy pursues two major goals: localisation of the workforce and the development of local servicing companies. Furthermore, mechanisms for enhancing the quality of the education and vocational systems, staff training and a constant upgrading of workers' skills are the pillars of effective local content policy.
(4) A well-functioning petroleum fund is an important element in the process of moving away from a hydrocarbon-based economy. An economy is well served by a petroleum fund when it is run according to precise fiscal rules and is integrated into the state budget. In such a context, funds can be immunised against political interference. The petroleum fund acts as a catalyst for the creation of economic links with the wider economy. Petrochemical manufacturing and service sectors account for the creation of economic links within the oil and gas sectors: the service sector plays a major role in increasing economic

Table 4.2 Summary of comparative cross-country case studies

Characteristics	Norway	Kuwait (OPEC)	Azerbaijan	Nigeria (OPEC)	Notes
General information					
Geography	Europe	Middle East	Caspian	Africa	
Access to sea	Yes	Yes	No	Yes	
Reserves at end 2014					
Oil (billion barrels)	6.5	101.5	7.0	37.1	
Gas (trillion m^3)	1.9	1.8	1.2	5.1	
Production at end 2014					
Oil (thousand bpd)	1657(exports)	2618 (exports)	747 (exports)	2361 (total production)	
Gas (billion m^3 daily)	104.1 (exports)	3.7 (imports)	7.7 (exports)	38.6 (total production)	
(Refinery capacity (thousand bpd)	316	936	–	–	
National oil company	Statoil	KPC	SOCAR	NNPC	
Fuel export (% of merchandise exports) (%)	67	94	93	88	
Governance of oil and gas sector					
Fiscal regime	Concessionary system: licence	TSA	PSA	Joint venture and PSA	Technical and financial capabilities play major role in selection of model for exploration and production agreement
Policy-making function: set policy of oil and gas sector	Ministry	PSC	Ministry	Ministry	In Norway, policy-making body is separate from regulatory body, but not in Azerbaijan and Nigeria. Kuwait has an extra agency for policy-making function

(continued)

Table 4.2 (continued)

Characteristics	Norway	Kuwait (OPEC)	Azerbaijan	Nigeria (OPEC)	Notes
Regulatory function: monitor and oversee petroleum activities	NPD	Ministry	SOCAR and ministry	NNPC and ministry	In Nigeria different agencies are involved in regulatory functions Technical competence of regulatory body is to effectively curtail and oversee all activities in oil and gas sector
Operator function: Role and degree of autonomy of NOC	NOC: Statoil has high technical capacity and plays major role in technical transfer and development of domestic supply sector Also IOCs	KPC	SOCAR	NNPC	In Norway Statoil has commercial function and is partially privatised In Nigeria, because NNPC acts as regulatory body and in PSA contracts as NOC, multiple functions cause conflicts of interest Same applies to Azerbaijan due to multiple roles of SOCAR
Human capacity building					
Education	High quality and adequate funding	Low quality and low funding	Low quality and low funding	Low quality and low funding	Common issue is mismatch of supply and market demand
Training system	NOC plays key role Well-designed programme and R&D	NOC plays poor role Inefficiently functioning programme and R&D	NOC plays poor role Inefficiently functioning programme and R&D	NOC plays poor role Inefficiently functioning programme and R&D	Norway introduced effective regulation and funding to develop local capacity Kuwait relies on expatriates and ineffective training system
Cooperation with research and academic institutions	Establishment of petroleum research centre and cooperation with local and international universities and research institutions	Low funding and cooperation with research institutions	Low funding and cooperation with research institutions	Low funding and cooperation with research institutions	Norway has introduced regulation obliging IOCs to conduct research in Norway

(continued)

Table 4.2 (continued)

Characteristics	Norway	Kuwait (OPEC)	Azerbaijan	Nigeria (OPEC)	Notes
Petroleum revenue management and economic diversification					
Macroeconomic stabilisation	Saving and future generation fund	Saving and future generation fund	Saving fund	Infrastructure, saving and future generation fund	Design and fiscal rules of the fund plays a major role in effective and transparent use of petroleum revenues
Diversification	Growth of non-oil sectors Within petroleum sector and other non-oil sectors	Low growth of non-oil sectors More within petroleum sector	Low growth of non-oil sectors Reform consists of increase in public capital spending, such as infrastructure and services	Low growth of non-oil sectors Reform consists of an increase in public capital spending, such as infrastructure and services	Norway's economy is less dependent on petroleum sector, thanks to its non-oil industries Other countries tend to increase productive activities to diversify sources of revenue generation by increasing capital spending. This is reflected in growth of GDP in recent years Lack of adequate infrastructure development

productivity and, in the context of local content policy, local service companies accelerate the transfer of skills and technologies and the creation of jobs. In addition to the hydrocarbon-related sectors, other non-petroleum productive sectors, such as agriculture and industrial manufacturing, appear to be determinants of the success or failure of petroleum-abundant states in the development of sustainable economic growth.

Best practice in petroleum wealth management indicates that a petroleum resource curse is not inevitable. Prudent and sound institutional, human resource capacity building and petroleum revenue management policies help avoid transmission of the resource curse. This study suggests that a well-designed institutional governance model for the petroleum industry is vital to addressing common problems associated with effective economic and human resource development. The key points of comparative cross-country case studies are summarised in Table 4.2.

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