AFRICA 2050

Using Natural Resources as a Springboard for Development

Emerging Markets Forum

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Resources should be a blessing, not a curse. They can be, but it will not happen on its own. And it will not happen easily.

Joseph E. Stiglitz, Project Syndicate, August 6, 2012

Natural Resources Can Finance Inclusive Development

For many African countries the natural resource sectors (oil, gas and mining – the extractive industries) are important parts of the economy. If harnessed right, these natural resources can constitute a huge opportunity for development. By exploiting its natural resource base, in essence converting its underground minerals and agricultural potential into human and physical capital to create inclusive growth, Africa could by 2050 become factory and granary to the world, just as Britain and the US were the factories and the US and Argentina the granaries in the second half of the 19th century, followed by China and Australia in the 20th century.

This is a vision of economic convergence for Africa's resource-rich economies, in which these countries "catch up" with other high and middle-income countries to achieve broadly the same per capita income and development outcomes. Over the next 40 years the African continent could build on its natural resource and agricultural production base to become an important supplier of intermediate and finished goods and agricultural products, relying on a diversified private sector and a high degree of economic and geographic integration. Africa's factories and agribusiness processing centers, linked by world class regional infrastructure (rail, road, electricity and ICT) to its raw material production centers and farms, could transform these inputs into intermediate and finished products, from where they would be exported to clients on the continent and across the world. By 2050 Africa could also possess a significant service sector, particularly in natural resource extraction-related activities such as mining finance, technical design, and environmental and social analysis. The continent could be home to major multinational corporations operating in the extractive industries across the globe.

The key challenge faced by Africa's resource-rich countries consists of transforming the resources in the ground into assets that lead to strong sustainable growth, economic diversification, reduction of inequality and poverty, and equity between generations. This chapter reviews the natural resource sector and outlines the key policy actions that Africa's governments will need to put in place to achieve the vision of convergence.

Africa and extractive industries remain inextricably linked. In many African countries, the natural resources sector constitutes a significant proportion of the formal economy. Africa is also an important player on the world stage for many mineral resources. In part this is because of its historical legacy as the continent where many of today's extraction techniques were first developed (copper and cobalt in Zambia, gold, platinum and diamonds in South Africa, bauxite in Guinea, liquefied natural gas in Algeria, phosphates etc.), and the African continent still

boasts very rich deposits of ores that are much higher grade than elsewhere on the planet (bauxite in Guinea, copper in the Democratic Republic of Congo, gold in Ghana, iron ore in Liberia and Guinea, phosphates in Morocco, etc.).

Extractive industries have shaped the economies of many post-colonial African countries: Nigeria's oil and gas industry has defined the country's past four decades of economic development and has left significant governance and social development problems in its wake. The Democratic Republic of Congo's copper, cobalt, diamonds and coltran[1] have fueled armed conflict and political instability in the east of the country and elsewhere. Guinea's fabulous bauxite reserves enabled it to survive epic macroeconomic mismanagement since independence in 1956.[2]

On the other hand, Botswana's extraordinary success in moving from a very poor colony to a well-performing middle-income country in less than half a century has largely been ascribed to the responsible management of its diamond resources (see Box 3 below). South Africa has a strong, dynamic, world-class private sector and modern infrastructure largely built upon and financed by developments in the mining industry for over a century, even as some of its traditional resources reach exhaustion. Mozambique's exploitation of its gas and coal reserves has fueled inclusive growth which has largely erased the scars of its post-independence upheavals. More recently, responsible management of gold and gemstone production in Tanzania and gold and oil and gas in Ghana has created economic growth which is transforming these countries' economies and creating strong private sectors. For good or for ill, the extractive industries make a very significant impact on the economies of Africa's resource rich countries. The challenge for Africa's policy makers is to apply the right combination of policies to ensure that this impact is positive and will lead to the kind of inclusive growth necessary for economic convergence.

Yet Africa's reputation as an exceptionally well-endowed region can be overstated. While it's true that mining and oil and gas have been important sectors in the continent's economic development for over a century, today, with a few exceptions, Africa's mineral resource endowments in terms of proven reserves turn out to be rather modest at a global level (see Table 1), ranging from 1% of world total reserves for iron ore to 26% for bauxite, the raw material for aluminum. Africa's production, too, of most key bulk minerals such as oil and gas, coal and iron ore mirror its global reserve position as fairly modest and does not stand out as exceptional. But there are some exceptions to this: Africa is still by far the most important reserve base and producer of gemstones, titanium and bauxite.

[1] Coltran is an ore combining columbite and tantalite, from which the elements niobium and tantalum are extracted. Tantalum is used to manufacture capacitors, used in electronic products such as integrated circuit chips, and is therefore present in minute quantities in almost all electronic devices. Coltan mining has been cited as helping to finance armed conflict in the Eastern Congo and is termed a conflict mineral.

[2] The author of this chapter remembers visiting Guinea's tropical capital Conakry in the mid-1980's, and seeing row upon row of snow plows sent by the Soviet Union in exchange for Guinean bauxite under the barter trade agreement between the two countries.

Table 1: Reserves and production of key natural resources

	Unit		Reserves end 2011			Production 2011			Reserves/Production (yrs)	
			World	Africa	%	World	Africa	%	World	Africa
Oil	*M Tonnes*	(1)	234300	17600	8%	3995.6	417.4	10%	59	42
Gas	*Bn Cubic Metres*	(1)	208400	14500	7%	3276.2	202.7	6%	64	72
Coal	*M Tonnes*	(1)	860938	32895	4%	5933	219.9	4%	145	150
Iron Ore	*M Tonnes*	(2)	170000	2500	1%	2800	70	3%	61	36
Bauxite (Alu)	*M Tonnes*	(2)	29000	7600	26%	220	20	9%	132	380
Titanium Ore	*M Tonnes TiO_2*	(3)	692	140	20%	6.7	2.02	30%	103	69
Copper Ore	*M Tonnes Cu*	(2)	690	50	7%	16.1	1.25	8%	552	40
Gold	*Thou. Tonnes Au*	(2)	51	9	18%	2.7	0.32	12%	159	28
Gemstones	*$ billion value*	(2)	No data available			80	50	62%	No data available	

Source: (1) BP Statistical Review June 2012; (2) USGS Mineral Commodity Studies 2012, own estimates; (3) USGS Mineral Commodity Studies 2012, Titanium mineral concentrates (ilmenite and rutile)

That today Africa possesses only modest shares of global proved reserves may be an indication of lower investment in mining exploration that has taken place in recent years on the African continent. Investments in exploration, the key step before reserves can be certified, are probably lower in African countries than elsewhere, because of the greater risk for mining companies on the continent and the more arduous investment environment that Africa represents for them. In addition, technological advances and higher commodity prices have made extraction of lower grade ores located in other parts of the world economically viable, so they are now included in global reserve figures where in previous decades they were not. This lowers Africa's share of the total. However, Africa's resources are for the most part of higher grades than in other parts of the world. If commodity prices decline, Africa's resources would be among the last to be shelved and its share of the total reserve base would increase.

Natural resource endowments don't automatically lead to better development outcomes

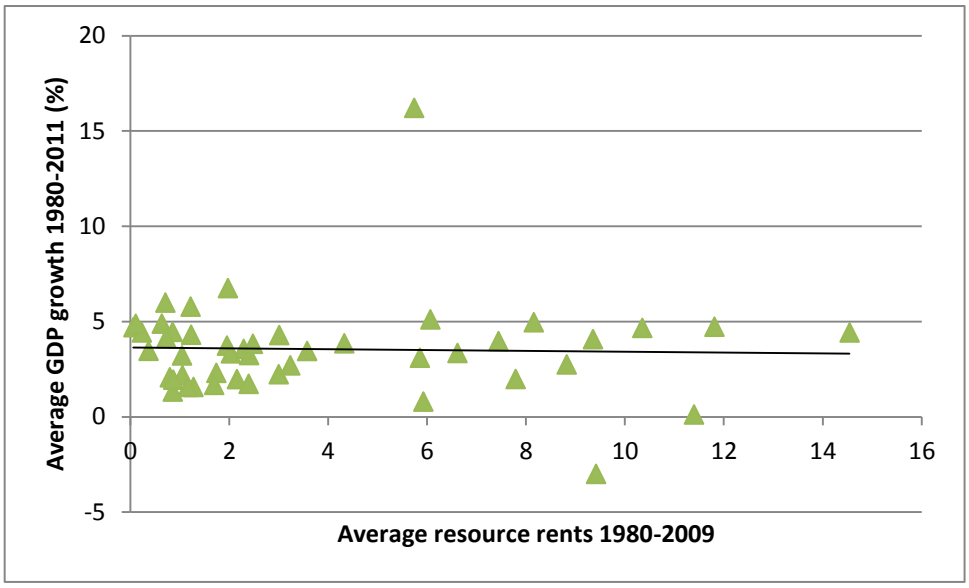
It is part of the conventional wisdom that natural resources have been a curse for Africa. But the effects of mineral resource endowments on the economy and social structures are complex and by no means a foregone conclusion.

It has often been stated that Africa's mineral wealth has not contributed as much as it should have to the development of the African continent itself. It seems that in many cases Africans have stood by as foreign firms extracted their resources, paying taxes and royalties to national governments that either have not had the capacity or have lacked the governance mechanisms to ensure their use for broad-based growth. In the worst cases, resource rents have led to Dutch disease and loss of competitiveness, or to widespread corruption, hollowing out local

traditions and institutions, and creating a culture of rent seeking and extraction, sometimes even to armed conflict and war.

While it is true that looking to the past, some of those countries with very strong endowments seem to have had greater difficulty creating the strong institutions needed to form the basis for inclusive growth, in actual fact there does not seem to be any clear-cut statistical correlation between resource endowments (measured as the share of resource rents in GDP) and growth over a long period (figure 1 below). Moreover, recent economic research suggests there is little causal link between oil wealth and conflict, based on cross-country analysis and correcting for other explanatory variables (Cotet and Tsui 2013). While this research is narrower than the subject of this chapter both in terms of the commodity reviewed (oil) and the specific outcome (conflict, as opposed to other negative impacts), the rigor of the analysis underpins the broader conclusions of this chapter.

Figure 1: Africa: Correlation between GDP growth and share of resource rents in the economy



Source: World Bank and Centennial Group data

Mining and oil and gas make little direct contribution to the local economy. Extractive industries are highly capital-intensive and neither create many jobs nor contribute significantly to development of skills and human capital. This is as true in Africa as it is in other parts of the world. Mining and oil and gas operations have few forward or backward linkages to the rest of the economy and have often been managed as virtual enclaves without much impact on the economies of host countries other than payment of taxes and royalties. They do, however, have a very significant impact on the physical environment because of the operations involved in extracting the ore and disposing of tailings (mining waste). Mining and oil and gas can also have very significant impacts on local communities. While in some cases these impacts can be beneficial, for the most part they have tended to be deleterious, particularly during the construction phase when imported labor can introduce prostitution, sexually transmitted diseases such as HIV/AIDS and petty crime. During the production phase tensions can arise

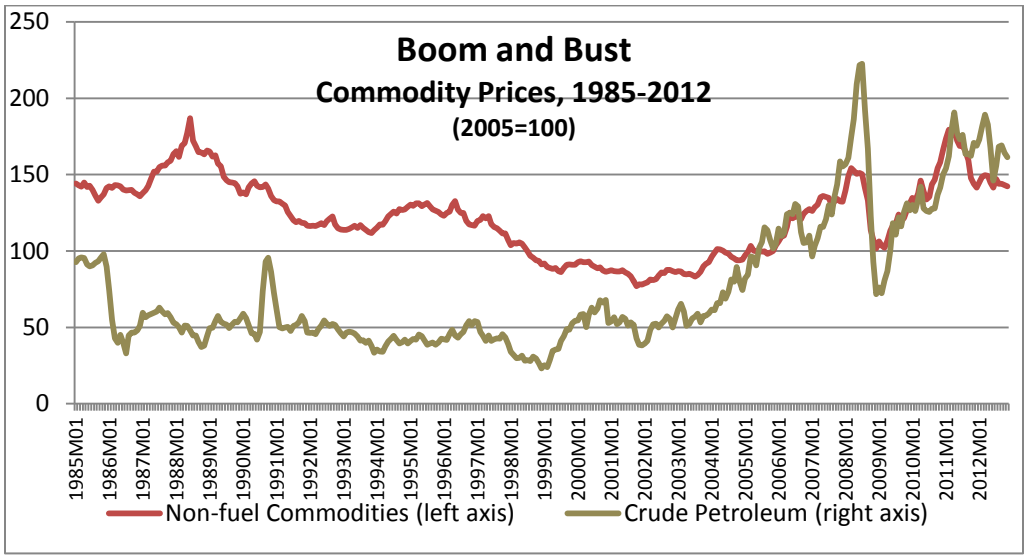
between local communities and the central government and production companies (e.g. in the Niger and Escravos Deltas in Nigeria), when local communities deem the sharing of the proceeds of resource extraction as unfair.

As the body of experience with extractive industries deepens, we are beginning to see greater positive interaction between extractive industries and the rest of the economy, particularly in countries where resources have been developed more recently (oil and gas in Ghana, ilmenite in Madagascar, coal in Mozambique). In part this is because of clearer requirements imposed on investors by host countries, who now require firms to integrate their operations better with the local economy; in part because of a greater appreciation by mining and oil and gas companies themselves of the long term costs to their shareholders from negative environmental and social impacts.

Resource-rich countries face specific macro-economic challenges

Part of the problem is that resource-rich countries face a set of macro-economic challenges that other developing countries don't. In the context of the process of transforming natural resources into inclusive growth, resource-rich countries need to avoid the typical boom and bust cycles associated with resource earnings (Figure 2), as well as the distortions caused by spending in excess of the economy's absorption capacity and the attendant increases in inflation and real appreciation of the currency, a phenomenon frequently linked to resource booms.[3] Similarly, policies need to be designed with a view to minimize the adverse effects of an eventual permanent decline in resource earnings as the resources become exhausted. These effects could be severe.

Figure 2: Commodity prices, 1985-2012



Source: IMF and Centennial Group estimates

[3] These distortions include overheating of the economy and the real appreciation of the currency, which through relative price changes leads to declining tradable sectors, a phenomenon known as "Dutch disease." It can also lead to the breakdown in governance, increased corruption and the tendency of wasteful public spending ("white elephants").

The policy agenda to achieve African convergence by 2050

Resource-rich African countries can use their resources as a springboard to finance the investments necessary to achieve inclusive growth. By 2050 there are real possibilities for Africa to become the factory and granary to the world. Under such a scenario natural resource rents will present a much smaller share of GDP, because of growth in other sectors of the economy. The key challenge is how to use its resource rents to create the capital (human, infrastructure, financial) to realize sustained growth.

The series of actions will need to focus on resource rents on the one hand, and on broader macroeconomic management on the other.

Actions on resource rents:

- **Obtain a greater share of resource rents** through better informed negotiations with mining and oil and gas companies, and greater transparency and public accountability to reduce opportunities for corruption
- **Manage the resource rents wisely**, through rigorous macroeconomic management based on simple fiscal rules to offset boom and bust cycles and make the necessary intergenerational tradeoffs. This is likely to include the creation of stabilization and wealth funds

Actions concerning broader macroeconomic management for convergence:

- **Invest resource rents** to create inclusive development, notably in public infrastructure and human capital
- **Foster the creation of a diversified private sector** alongside its extractive industries to provide the basis for strong, inclusive growth. This will need to be based in particular on greater integration of Africa's economies – integration on the economic level through dismantling existing trade and regulatory barriers between and within countries; on the geographic level through cost-effective regional infrastructure; and of its labor force through common educational standards.

The following chapter identifies the challenges of transforming underground mineral wealth into long-term sustainable and inclusive growth.

Extracting and Transforming Africa's Resources

Extracting resources more equitably – getting a better deal for the continent's people

Natural resources create resource rents when they are produced. These resource rents are shared between the investor in the mine or oil field development and the host country. On balance, African countries do not receive as large a share of the resource rents as other regions of the world.

Resource rents are the surplus of value of the resource in the ground valued at its market price, over the cost of its discovery and extraction. These resource rents justify resource-specific taxes over and above income and value-added and sales taxes, to ensure equitable sharing between the investor company and the sovereign owner of the resource.

Resource rents justify specific resource taxes

Resource rents. In economic terms, production of natural resources generates a "resource rent", defined as a surplus of value of the resource in the ground when valued at the market price, over the cost of its discovery and extraction. Resource rents increase when commodity prices increase, and the richer the ore body the greater its value in the ground, i.e., the higher the resource rent as well. Taxing natural resource production at rates above the country's income tax rates is justified by the sovereign ownership of the underground resource and the rent that this resource generates.

Governments argue – with some justification – that a significant portion of this resource rent should accrue to the host country, hence the need for a specific resource tax over and above economy-wide tax rates (income and value-added or sales taxes). The key challenge for all resource-endowed countries is how to set up a fiscal framework to tax resource rents at levels that maximize fiscal flows to the country but do not dissuade investor companies from exploring and producing the resource. The problem is compounded because commodity prices vary in unpredictable ways and with them, the value of the resource rent itself, and this can introduce wild swings in tax revenue and company profit.

For the purposes of this chapter we have categorized African countries as **Resource Dominant**, i.e. those for which resource rents represent 10% or more of GDP in 2009; **Resource Available**, with resource rents between 2% and 10% of GDP; and **Resource Poor**, with resource rents less than 2% (Table 2 below).[4] Naturally, this classification of countries will change as new reserves of minerals and oil and gas are discovered in coming years.

[4] Source: World Bank estimates

Table 2: Resource rents (% of GDP)

Resource Dominant		
	2009	Av. 2000-2009
Congo, Rep.	53.7	63.3
Equatorial Guinea	46.2	69.4
Libya	46.1	53.4
Gabon	41.1	46.6
Angola	38.4	56.0
Mauritania	37.7	23.6
Chad	33.6	30.6
Algeria	25.1	33.5
Nigeria	24.5	35.2
Zambia	17.6	10.5
Sudan/South Sudan	16.2	17.1
Congo, Dem. Rep.	14.9	10.2
Guinea	14.8	9.4
Egypt, Arab Rep.	10.5	15.0

Resource Available		
	2009	Av. 2000-2009
Mali	9.8	5.0
South Africa	7.5	5.1
Cameroon	6.6	8.9
Ghana	6.6	2.6
Cote d'Ivoire	5.8	5.1
Tunisia	5.5	5.4
Zimbabwe	4.7	4.6
Mozambique	4.7	4.3
Tanzania	4.3	2.0
Burkina Faso	3.5	0.6
Botswana	3.0	3.2
Morocco	2.2	1.5
Togo	2.0	1.2

Resource Poor					
	2009	Av. 2000-2009		2009	Av. 2000-2009
Liberia	1.4	0.3	Swaziland	0.0	0.0
Senegal	1.3	0.4	Benin	0.0	0.0
Burundi	1.1	0.5	Cape Verde	0.0	0.0
Namibia	0.9	0.9	Comoros	0.0	0.0
Sierra Leone	0.8	0.4	Gambia, The	0.0	0.0
Niger	0.8	0.4	Guinea-Bissau	0.0	0.0
Ethiopia	0.2	0.1	Lesotho	0.0	0.0
Eritrea	0.0	0.0	Malawi	0.0	0.0
Kenya	0.0	0.0	Mauritius	0.0	0.0
Madagascar	0.0	0.0	Sao Tome and Principe	0.0	0.0
Central African Republic	0.0	0.0	Seychelles	0.0	0.0
Rwanda	0.0	0.0	Somalia	0.0	0.0
Uganda	0.0	0.0	Djibouti	0.0	0.0

It should be noted that this definition of *Resource Dominant*, *Resource Available* and *Resource Poor* is based not on the absolute value of the resource rent but on its impact on the economy as a whole. This means that economies with fairly significant mining sectors such as Namibia

(diamonds, uranium) or Madagascar (ilmenite) figure as Resource Poor either because a fairly diversified economy reduces the impact of the mining sector (Namibia) or because of the very low resource rent of the mined commodity (the market price of ilmenite is only marginally above its cost of extraction) and therefore the rent represents only a marginal part of Madagascar's GDP. It may also demonstrate that a country is only obtaining a marginal share of the resource rent due to overly generous tax terms.

Resource Extraction Cycle

Extraction of oil, gas and minerals follows a fairly well defined cycle for all countries, and in each country is governed by a legal and contractual framework that depends on the country's specific oil and gas, mineral and investment legal codes. The degree to which a mining or oil and gas extraction operation is governed by law or contract varies from country to country.

The extraction cycle commences with exploration, for which an exploration permit generally has to be obtained by the investor. Once economically viable oil, gas or mineral resources have been discovered, the investor generally has then to obtain a production contract, before developing the resource and investing in production facilities. During the life of the oil or gas field or the mine, production parameters (such as minimum investment amounts) and tax and royalty payments are defined by this production contract, which generally also defines social and environmental responsibilities and end-of-life remediation steps that will need to be taken. In some cases these parameters are contained in the legal framework instead. As a general rule, processing oil, gas or minerals into usable intermediate or end products (petroleum products, metals etc.) may or may not be carried out in the country of production. In any case, if it is, the legal framework and tax regime are for the most part those of other industrial sectors.

Table 3: The resource extraction cycle

	Legal Framework		Resource Taxation	
	Oil and Gas	**Minerals**	**Oil and Gas**	**Minerals**
Exploration	▪ Exploration permits auctioned off under a competitive process	▪ Exploration permits granted on a first-come first-served process	▪ Exploration bonus paid for right to explore	▪ No bonus paid (but minimum investment commitment)
Production	▪ Production sharing contract	▪ Concession contract	▪ Royalty ▪ Oil production tax ▪ Equity stake for government	▪ Royalty ▪ Mineral production tax ▪ (Often a tax holiday is granted for the initial years)
Processing	▪ Refining and processing are generally undertaken as part of the legal framework covering industry		▪ Refining and processing are taxed at normal income tax rates. Petroleum products have specific excise taxes in addition to any economy-wide value-added or sales tax	

Source: Centennial Group

Attribution of exploration and production permits. Oil and gas exploration permits are generally auctioned off in "blocks" (a block is a defined acreage for exploration), and potential investors' bids include an initial cash payment ("signature bonus") to the government, as well as investment or exploration commitments. The government selects the highest bidder defined as a combination of the signature bonus and investment commitment. Mining exploration permits, on the other hand, are traditionally granted on a "first-come-first-served" basis and seldom include cash payments. This reflects the generally lower resource rent of the mineral compared to oil and gas and the lower degree of competition for mining exploration acreage.

At the production stage, oil production permits are generally "**production sharing agreements**" that include a significant equity share for the government in the investment itself.[5] The government is thus both sovereign regulator and shareholder. Once the oil field is under production the government receives, because of its equity in the field, either a cash payment equal to the value of its oil (on top of royalties and taxes due to it as sovereign), or it takes physical delivery of a percentage of total oil production which it will often then market directly or refine through its national petroleum company.

[5] The government's equity share is often "carried", i.e. financed by the private investor and reimbursed out of future cash flow.

Many mining production contracts on the other hand have been straightforward **concession agreements** which define royalties and taxes as well as the investor's obligations but do not include an equity share of the investment for the government. There are, however, important exceptions to this rule and increasingly, as commodity prices have risen in the past decade, governments have sought to take a stake in the equity of the mining operation as well.

Africa's record with resource extraction contracts

On balance, African countries obtain a worse deal than other countries with resource rent sharing. Although it is difficult to obtain hard data concerning the resource rent-sharing terms of natural resource production contracts in Africa (see section II-A-2 below), abundant anecdotal evidence suggests that African countries obtain on average a lower share of resource rents than countries in other regions of the world.

In part, the lower share of resource rents that African countries obtain represents the higher risk and cost of investing in the African continent. Governments in Africa have the reputation of being less predictable; the risk of expropriation is higher, at least based on historical records; there is a greater risk of armed conflict; and Africa's infrastructure endowment is lower. All of these factors represent risks (or in the case of infrastructure, costs) that investors will need to offset through a higher return on their investment, and therefore a larger share of the resource rent. Risk and return are strongly correlated and African countries must grant investors more of the resource rent because of the perception that Africa is a risky place to do business.

But higher risks and increased infrastructure costs are not the only reasons for the less favorable contractual terms African countries obtain for their resources. A lower share of the resource rent also results from the weaker negotiating stance that African governments generally have in their negotiations with private investors compared to other parts of the world. African governments often have lower capacity and less extensive information, and do not make enough use of external expert advice in their negotiations.

Corruption lowers government take. Corruption, too, will result in a worse deal for the country and a lower share of the resource rent for the government. Side payments to officials and persons of influence do not come out of investors' profits (i.e. the private sector's share of the resource rent) but out of the government's share, and so these payments reduce the government's formal take of the resource rent. While African countries are probably no more corrupt than those in other parts of the world, there are fewer external checks in Africa in the form of the transparency that civil society oversight would bring, and therefore corruption may have more of an impact on resource sharing in this region of the world than elsewhere.

Nationalization is not a solution. In past decades some countries (not only those in Africa), frustrated by the unfair sharing of resource rents and the "raw deal" they believed they were obtaining for their natural resources, resorted to nationalization (replacing private investors by state-owned companies) or indigenization (transferring a portion of ownership of existing assets to nationals) to increase the national share of the resource rent. But these strategies have not been viable options for Africa any more than they have in other parts of the world: Where oil, gas and mineral extraction is undertaken by a state-owned enterprise the outcome frequently combines both inefficiency and corruption. By almost any measure most natural

Box 1: Mining ownership in Zimbabwe and South Africa

The mining sectors in Zimbabwe and South Africa have been important drivers of economic activity for these countries for over a century, producing gold, platinum, diamonds and other minerals. In both countries mines were developed – at least initially – by foreign investors, creating well-known companies such as Anglo-American, Goldfields, de Beers and others.

Following majority rule in both of these countries, there was significant unhappiness about the lack of equity in the sharing of the resource rent. In both cases there has been a concern to transfer ownership of the sector to formerly disadvantaged nationals.

South Africa attempted to change the ownership structure of its mining industry in 2004. The Mineral and Petroleum Resources Development Act sought, among other things, to expand opportunities for historically disadvantaged South Africans ("HDSAs") to enter the mineral industry and obtain benefits from the exploitation of mineral resources; and to promote employment, social and economic welfare as well as ecologically sustainable development. Companies were required to lodge a social and labor plan on how they intended to expand opportunities for historically disadvantaged persons. The MPRD Act (incorporating the Mining Charter) also required a mining company to have ownership by HDSAs at a level of 15% by April 30, 2009 and 26% by April 30, 2014, transferred at fair market value. A review of this legislation undertaken by the government in 2010 concluded that so far it has not been fully successful in transferring significant assets to new investors (9% had been transferred by 2009), and opened questions about whether the priorities should focus on improved fiscal terms for the government rather than transfer of capital ownership to political elites. However, the 2014 target has been maintained and guidance has been provided about other aspects of the charter (e.g. dividend payments, job creation and training). The government retains wide-ranging discretionary powers in the sector.

In 2010 **Zimbabwe** passed an "indigenization" law under which foreign companies must transfer a controlling stake (51%) to indigenous nationals over a five year period. An "indigenous Zimbabwean" is defined as "any person who before the 18 April 1980" - the official founding date of Zimbabwe - "was disadvantaged by unfair discrimination on the grounds of his or her race". This ruling has created opportunities for politically well-connected individuals to benefit from the rent transfer (the UK press has referred to this as "Racketeering by Regulation") and has had a chilling effect on investment in the Zimbabwean mining sector. It will not, however, increase the share of rent that goes to government to pay for investments in human and physical capital.

In terms of **investment outcomes** in the mining sector following the introduction of the new legislation, South Africa has fared considerably better than Zimbabwe. South African mines continue to attract capital, both domestic and foreign. Whether this is a reflection on the more modest targets imposed in the law, or a greater sense of legal due process open to investors in South Africa, is not clear.

resource-based state owned companies, such as Sonatrach in Algeria (oil and gas) and Gécamines in Democratic Republic of Congo have significantly underperformed compared to their private peers. Transferring a portion of the capital to nationals creates very significant opportunities for rent seeking and corruption and does not address the central issue of inequitable sharing of the resource rent between the investor and the government.

To get a better deal for their countries, African governments will need to take into account the fact they are operating in a competitive environment, and private investors have the choice to go elsewhere. Three sets of actions are needed: those to reduce investors' costs and perceptions of political risk; those to enhance governments' negotiating capacity; and those to eliminate corruption. By reducing their handicaps, most notably the perception of the risk of investing in the continent, and by having negotiators who are world class, honest, and very well informed, the terms of the deal will become much better balanced. And greater transparency is the best way to reduce or eliminate corruption.

The plague of confidentiality and lack of transparency

Greater transparency would lead to more equitable sharing of resource rents. The first step toward obtaining a fairer share of the resource rent would naturally be to have greater transparency across the region about what precisely the ratio of rent sharing is, i.e. what tax and royalty rates, and other parafiscal levies, private investors have to pay. However, the terms of contracts governing the extraction of natural resources in Africa are difficult to obtain, even for government officials from the country who are not in the relevant sector ministry.

In recent decades African countries have started to base their mining codes and oil and gas legislation, including their fiscal frameworks, on standardized best-practice-following policy advice provided notably by the World Bank. This initiative has been praised by industry because it provides them with a more rational framework for comparison between countries and reduces the dimensions in negotiations between the two parties. It should also have significant advantages for civil society because it has the potential of providing them too with a standardized comparison. But despite being based on a common framework the precise fiscal terms are almost never known beyond the relevant ministries (mines or energy, and in some cases the ministry of finance). Confidentiality is often explained on the grounds that these sectors are "strategic." Whatever the merits of this argument, the resulting lack of transparency prevents public scrutiny, favors side payments and corruption and leads to poor development outcomes.

Initiatives to promote greater transparency and fairness

Given the widespread lack of transparency in the extractive industries, several global initiatives have been launched to improve outcomes for resource-rich countries, including those below:

- **The Extractive Industries Transparency Initiative** (**EITI**), the most important global initiative on natural resource governance, was created in September 2002 at the World Summit on Sustainable Development in Johannesburg. It is financed by a number of OECD countries with a Secretariat based in Oslo, Norway. It aims to improve transparency of payments by oil, gas and mining companies to governments or government agencies such as state owned enterprises, as well as transparency of the use of revenues by host country governments. EITI has been implemented in 37 resource rich countries, of which 18 are fully compliant with EITI principles,

Box 2: Extractive Industries Transparency Initiative criteria

1. Regular publication of all oil, gas and mining payments by companies to governments; all revenues received by governments from companies; data made available to a wide audience in a publicly accessible manner.
2. Payments and revenues are the subject of a credible, independent audit, applying international auditing standards.
3. Payments and revenues are reconciled by a credible, independent administrator.
4. This approach is extended to all companies including state-owned enterprises.
5. Civil society is actively engaged as a participant in the design, monitoring and evaluation of this process and contributes towards public debate.
6. A public, financially sustainable work plan for all the above is developed by the host government, including measurable targets, a timetable for implementation, and an assessment of potential capacity constraints.

Source: EITI, abridged by author

and 19 candidate countries. One country has been suspended.

EITI has issued a set of reporting guidelines, a Statement of Principles, and six Criteria which represent the global minimum standard for EITI implementation. In May 2005 an International Advisory Group (IAG) was established under the Chairmanship of Peter Eigen (who founded Transparency International, a global NGO which fights corruption),[6] to assess the progress made by the EITI.

African countries are important players in EITI, representing over half of all the countries involved in the initiative. Currently, ten of the EITI-compliant countries (out of 18) are from the African continent and 11 of the candidate countries (out of 19). The one suspended country – Madagascar – is from Africa as well (Table 2). EITI has had a significant and positive impact on transparency in financial flows in the oil, gas and mining sectors of its member countries, reducing opportunities for corruption and improving outcomes.

Table 4: African countries active in EITI, January 2013

EITI Compliant Countries in Africa	**EITI Candidate Countries in Africa**
Central African Republic	Burkina Faso
Ghana	Cameroon
Liberia	Chad
Mali	Cameroon
Mauritania	Democratic Republic of Congo
Mozambique	Gabon
Niger	Guinea
Nigeria	Republic of Congo
Tanzania	Sao Tome and Principe
Zambia	Sierra Leone
	Togo

- **The Kimberley Process Certification Scheme** (Kimberley Process or KP) is an international governmental certification initiative set up by governments, industry and civil society to prevent the trade in diamonds that fund conflict. Launched in January 2003, the scheme requires governments to certify that shipments of rough diamonds are conflict-free.

  The KP requires participating governments to certify the origin of rough diamonds and put in place effective controls to prevent conflict stones from entering the supply chain. Participant countries must enact domestic legislation to implement the scheme and can only trade rough diamonds with other members. Currently, 75 governments participate in the Kimberley Process. Its technical provisions are implemented by governments, but

[6] Peter Eigen is currently spearheading a joint initiative between the Hamburg-based Humboldt-Viadrina School of Governance and the Vale Columbia Center on Sustainable International Investment to provide developing country governments with assistance in negotiating investment-related contracts, notably in the extractive industries.

its tripartite structure means that non-governmental organizations and the diamond industry hold official status as observers and take part, along with member states, in all working groups and decision making processes.

The initiative has obtained some successes since its introduction, e.g. its tripartite approach to solving international problems and helping some of the countries that were worst-hit by diamond-fuelled wars to increase their official diamond revenues. However, it has been hobbled by the failure of member governments to deal effectively with problem cases such as Zimbabwe, Côte d'Ivoire and Venezuela. Despite the existence of the Kimberley Process, diamonds are still fuelling conflict. Although the scheme makes it more difficult for diamonds from rebel-held areas to reach international markets, there are still significant weaknesses in the scheme that undermine its effectiveness and allow the trade in conflict diamonds to continue.

- **Natural Resource Charter** is a global initiative designed to help governments and civil society effectively harness the opportunities created by natural resources. The Natural Resource Charter provides twelve Precepts to inform and improve natural resource management. It was drafted by an independent group of experts in economically sustainable resource extraction and has no political sponsorship. The Technical Advisory Group is chaired by Michael Spence (Nobel Laureate in Economics) and comprises 30 experts.[7] The Charter is governed by an Oversight Board chaired by Ernesto Zedillo, former President of Mexico. It is a common framework for addressing the challenges of natural resource management.
- **Publish What You Pay** (PWYP) is a global network of civil society organizations which undertakes public campaigns and policy advocacy to encourage disclosure of information about extractive industry revenues and contracts. The network is diverse, with over 650 member organizations across the world including human rights, development, environmental and faith-based organizations. In about 30 countries, network members have joined forces to create civil society coalitions for collective action to enhance transparency of natural resource revenues.

In addition to these global initiatives, several global advocacy NGOs focus on the issue of revenue transparency and corruption, either as part of a broader mandate (**Oxfam**) or as their key objective (**Revenue Watch** and **Global Witness)**.

The degree of success of these various initiatives is mixed. There is a consensus that EITI has had a very significant impact both on transparency of funds flows and on norms of behavior, particularly in the oil and gas sector. On the other hand, the Kimberley Process has been a mitigated success at best. Overall, however, these initiatives have together raised global awareness of the issues surrounding corruption and lack of transparency in resource-rich countries, including in particular within the civil societies of African countries, and are having a beneficial impact on the way these industries are managed.

[7] Including Paul Collier, Director of the Centre for the Study of African Economies at Oxford University; Karin Lissakers, Director of Revenue Watch Institute; and Tony Venables, Director of OxCarre at Oxford University.

Transforming and processing Africa's resources – who gets the benefits?

Spin-offs from processing raw materials locally

Africa's resources are mostly exported for processing elsewhere. To a large extent Africa exports its raw materials for processing and inclusion in finished products in other parts of the globe. For example, although Africa possesses 26% of world bauxite reserves and produces 9% of world bauxite, in 2011 it only produced 4% of primary aluminum.[8] There are, however, important exceptions to this rule, notably for precious metals and copper/cobalt, in which high transport costs and the high value of the finished metal make it more economic to process them locally.

Mining and oil and gas production are capital-intensive activities which do not create much direct employment. The lack of local processing therefore potentially foregoes opportunities for job creation, development of skills and human capacity, and linkages to the rest of the economy. For decades the continent's leaders have lamented the fact that Africa's raw materials are exported elsewhere for processing and have tried to encourage or coerce investors into integrating their activities downstream by investing in processing capacity in the region. But from an economic point of view this may have been a misguided priority.

Oil, gas and mineral processing are not very profitable businesses. Transformation processes such as oil refining, gas treatment and mineral processing can, at best, hope to cover their long run marginal costs over long periods, with significant over-shooting and under-shooting around this trend line. On average they do not generate significant profits or value-added and their contribution to GDP is small. For a processing plant to be able to buck the overall trend of low profitability and generate a profit over long period, it will need to have a **geographic advantage** of some sort.

For example, in the case of **oil refining** the geographic advantage is being located close to a major spot petroleum product market such as Rotterdam in Europe (at the mouth of the Rhine and barge transport into Germany); Singapore in Asia; and the Gulf Coast in the United States. These localities set international prices for traded petroleum products. Locating refineries close to these key market hubs minimizes overall transport costs because the cost of transporting crude oil to feed a refinery close to a market hub is significantly lower than the cost of transporting refined products from a distant refinery to the market hub.[9] Most African refineries therefore lose money in economic terms and need to be subsidized to remain in service (either directly from the treasury, or through administered prices for locally refined petroleum products which keep them above the cost of imports). This explains why only 1% of world refinery throughput takes place on the African continent, even though Africa represents 3.9% of world petroleum product consumption and produces 10.4% of the world's oil.[10]

[8] Sources: Reserves and production of bauxite: USGS; primary aluminum production: International Aluminum Institute (http://www.world-aluminium.org/statistics/primary-aluminium-production/#data)

[9] Petroleum products are transported in smaller, more technically sophisticated vessels than crude oil, which costs more per ton-mile.

[10] Source: BP Statistical Review, 2012 (June 2012). 3.6% of world refinery capacity is located in Africa but has a very low utilization rate due to its poor profitability.

In the case of **aluminum smelting**, the geographic advantage is due not so much to proximity to major market hubs as access to cheap energy, because of the extremely high energy cost of transforming alumina (an intermediate product between bauxite ore and metal aluminum) into aluminum. The only way an aluminum smelter can generate a positive margin over a long period is to buy electrical energy at a price far below its average world cost, generally because the smelter has access to extremely cheap hydroelectricity (e.g. smelters in Ghana, Cameroon, Canada) or has a contract to buy energy at a very low marginal cost (Mozal smelter in Mozambique, which has a contract with South Africa's ESKOM at fractions of a US cent per kWh). If a smelter does not have access to such cheap electricity it cannot hope even to break even. To some extent, iron ore is similar.

There are exceptions to this rule, notably precious metals such as gold, silver and the platinum group metals, and copper. In Africa, ores of these metals are generally processed at or close to the mine. The high monetary value of the metal and onerous transport costs justify refining into metal at the point of extraction because it is much cheaper to transport small volumes of high value metal than the ore. But even so, their processing does not create much employment nor do they have significant linkages to the rest of the economy.

The record on downstream processing industries in Africa

With a few notable exceptions such as diamond processing in Botswana (see Box 3 below), the record of downstream processing in Africa, when it has occurred, has not been good. As indicated above, most African processing plants already have a major handicap compared to optimal plants located elsewhere which benefit from a specific geographic advantage. In addition, unit investment costs have almost always been much higher than those in other parts

Box 3: Botswana – diamond sorting initiative

The discovery of the Orapa diamond pipeline in 1967 by De Beers introduced diamond mining to Botswana which has transformed the country from one of the poorest economies in the world to one of the fastest growing middle income countries in the world. Diamond production was undertaken through the Debswana joint venture, a 50/50 partnership between the Government of Botswana and De Beers.

In May 2006, the government and De Beers established DTC Botswana, as subsidiary of Debswana, to sort and value Debswana's production and to make aggregated diamond mixes available for sale in Botswana for local manufacturing. A building was constructed with a total capacity to process 45 million carats and accommodate up to 600 employees. It incorporates state of the art sorting equipment.

Today, DTC Botswana is the largest and most sophisticated rough diamond sorting and valuing operation in the world. DTC Botswana sells and markets rough diamonds to 21 cutting and polishing companies licensed by the Government of Botswana to carry out cutting and polishing activities locally. DTC Botswana aims to facilitate, drive and support the creation of a sustainable and profitable downstream diamond industry in Botswana that will deliver additional value for Botswana's diamonds. With further development of the Botswana downstream diamond industry, there is likely to be continued job creation in the coming years. The downstream activities add value to the local diamond industry through cutting and polishing of diamonds and ultimately manufacturing of jewelry.

The establishment of DTC Botswana also acts as a potential catalyst for the development of new business clusters such as banking; security; information technology; and tourism; and for other international businesses to invest in Botswana.

Source: Centennial Group

of the world, in part because of the poor infrastructure endowment which increases construction costs and in part because of poor procurement practices. For example, a Memorandum of Understanding signed in mid-2012 between the government of Nigeria and a private US-Nigerian joint venture for the construction of refining capacity of 180,000 bbls/day (9 million tons/year) sets the investment at $4.5 billion,[11] three times the estimated world average for the investment cost for a moderately complex refinery of a similar capacity (Favennec 2003). Nigeria is an expensive place to do business and Nigerian refineries will find it difficult to compete with those in Rotterdam and other market hubs.

Moreover, where processing plants have been set up in Africa, not only have their geographic disadvantages made them largely uneconomic, they have not been good at developing world class skills either because of poor profitability or poor management, although they may represent an important source of local employment. For example, before its privatization in 2002 the Zambian state-owned enterprise ZCCM, which smelted copper ore into copper and cobalt metals, was the most important source of employment in the Zambian Copper Belt, employing thousands of workers, but its operating techniques were decades old because of the lack of investment in its plants, and the skills it imparted were not very useful outside its own operations. The Nigerian state-owned petroleum company NNPC has had great difficulty in keeping its oil refineries operating due to low profitability and poor maintenance and has not been able to provide significant skills to the workers in the Nigerian refining industry.

The conditions for downstream processing to succeed

That downstream processing has led to disappointing outcomes in the past does not mean that it should be foregone in all cases going forward. There are some important success stories for downstream processing in countries like Botswana, South Africa and Morocco, and there is still a case to be made for it if the conditions are right. To work and make a positive contribution to the economy, downstream processing must respect three criteria:

- A significant **geographic advantage** other than reserves of the natural resource itself.
- Investment and ownership by the **private sector**, to ensure effective management.
- Downstream processing activities must be carried out in a **competitive environment** and operating or price subsidies must be eschewed.

Under these conditions, downstream processing makes economic sense and should be pursued.

Resource clusters: an ecosystem of private sector operators

Although downstream processing may not have been a very significant success in Africa because of the continent's geographic and other disadvantages (low infrastructure endowment, low labor productivity), the extractive industries have over the years created positive spinoffs in other ways. Most notably, ecosystems of firms providing support functions to oil, gas and mining operations have emerged organically around the extractive sector. For example, West African oil producers like Cameroon and Nigeria have seen the creation of internationally competitive support firms in oil logistics, maintenance and other associated services, some of which started as subsidiaries of international firms and others as local startups. South Africa has

[11] Source: Bloomberg, July 2, 2012

a record in the mining industry of harboring the best providers of mining services, from geologists and mining engineers to specialized banks, which now operate internationally. These clusters provide employment, create world-class capacity and possess strong links to the rest of the economy and are a model for African resource-based sectors going forward. They are not significantly capital intensive and have been good at creating specialized human capacity, often of a world class nature.

For governments, the best manner of exploiting the potential of the extractive industries for the development of human capital therefore seems to be to nurture these related-industry clusters. This support should include the creation of a business-friendly regulatory environment and the provision of specialized targeted infrastructure (communication and information technology, low-cost broadband Internet connectivity, efficient port facilities, modern airport infrastructure). Local higher education facilities can also assist through targeted vocational training in partnership with the private sector.

Macroeconomic Policy Framework for Resource-Rich Countries

The challenge in resource-rich countries

Sound macroeconomic management is key

As the previous section of this chapter has shown, extracting natural resources from the ground does not generate much employment, nor does it of itself enhance human capacity and impart skills. It does not provide significant direct economic linkages with the rest of the economy either. But it does generate economic rents, which through the associated royalties and taxes provide resources to the government, which are considerable in many resource-rich countries. Resource-rich African countries will need to use these rents to diversify and generate long-term inclusive growth, transforming underground wealth into human capital and public infrastructure.

This section looks at how the resource rents should be best managed at the macroeconomic level.

Boom and bust cycles

Many resource-rich African countries have experienced boom and bust cycles owing to the volatility in resource earnings and a pro-cyclical fiscal policy: considerable (frequently inefficient) spending increases associated with positive earnings shocks and abrupt reversals following adverse earnings shocks. Expenditures are adjusted to fluctuations in resource earnings; resource-rich countries overspend when times are good, i.e., when resource prices and associated revenues are high, and then cut back spending when resource prices and revenues decline. This has been evidenced in the commodity price cycle that followed the global financial crisis.

Such a pro-cyclical fiscal policy involves a complex and costly expenditure-decision process with potential negative effects on the quality and efficiency of public spending. Furthermore, it leads to macroeconomic volatility, which affects the private sector’s consumption and investment planning and decisions and thus hampers growth potential.

In Africa, limited public oversight and parliamentary checks and balances exacerbate the problem. In good times fiscal resources are directed to "white elephant" investments of marginal development value or finance recurrent expenditures such as civil servant salaries. An excessively large and relatively well-paid public sector attracts the best talent, impoverishing other sectors and drives up the cost of non-tradables within the economy. "Dutch disease" results from the appreciating exchange rate which renders tradable sectors less competitive. In bad times, budgets are cut indiscriminately across the board, undermining the sustainability of investments in social sectors and infrastructure. Schools are hit with unpaid salaries and lack of textbooks and infrastructure maintenance goes by the board.

Intergenerational trade-offs

Efficient use of resource rents also has an important time dimension. Resource-rich countries need to make the trade-off between extracting the resource now and leaving it in the ground for future generations. Moreover, for a variety of reasons (including uncertain future price developments) they may consider advisable to extract now, setting aside some of the proceeds for future use, in the form of financial assets.

Macroeconomic policy framework for resource-rich countries

To address these challenges, resource-rich countries need to implement policies that deal with volatility and intergenerational trade-offs. Potentially important tools in the management of fiscal flows are stabilization/liquidity funds, designed to help avoid boom and bust cycles, as well as wealth funds to help manage the economic distortions associated with resource booms and address intergenerational issues. The following sections elaborate on fiscal rules for the management of resource flows and on the use of resource funds.

Fiscal rules to promote macroeconomic stability

To de-link public spending from the dynamics of resource earnings for macroeconomic stability purposes, policy makers can adopt fiscal rules that define a sustainable public spending pattern that is protected from the volatility of resource earnings. Such rules would smooth public spending over time by allowing for larger (smaller) government deficits when resource earnings are lower (higher) than their long-term potential level.[12] Moreover, they apply automatically, avoiding the need for the complex and costly decisions referred to above.

Fiscal Rules for Macroeconomic Stability

Approach 1: Adopt a **Non-Resource Primary Fiscal Balance Target** (NRPB) to de-link fiscal policy from the volatility of resource earnings due to swings in external commodity prices

Approach 2: Adopt a **Structural Primary Fiscal Target** to remove cyclicality of resource and non-resource revenues

[12] These rules call for a well-defined formula and expert judgment to estimate long-term potential resource earnings and the benchmark/reference price of the natural resource. As the resource horizons and price developments are uncertain, this potential needs to be updated with some frequency.

This section focuses on two alternative rules or approaches. They establish short to medium-term fiscal targets that take into account fiscal sustainability in the longer-term. They consist of the adoption of (1) a non-resource primary fiscal balance target or (2) a structural primary fiscal target.[13] Both approaches involve the establishment of a stabilization/liquidity fund (see section 2 below), which accumulates revenues in good times that can be used to cover public spending in bad times, relative to long-term potential resource revenues. By smoothing public spending over the cycle, they are helping achieve effectively a more stable macroeconomic environment. Moreover, either approach will help improve the spending quality and efficiency of both the public and private sectors because it allows for better expenditure planning.

Resource Funds

Stabilization Fund offsets commodity price swings to smooth fiscal resource availability and government spending over the commodity cycle

Wealth Fund invests financial assets from resource extraction for use by future generations

The non-resource primary balance (NRPB) is the overall primary balance excluding all tax and royalty collection from natural resource activities. Thus, using the NRPB as a target helps de-link fiscal policy from the volatility of resource earnings. It measures the impact of government operations on domestic demand, given that resource earnings are originated externally. The structural primary balance (SPB) is the overall primary balance excluding the cyclical component of resource and non-resource revenue. The implementation of this approach requires an independent institutional framework to ensure credibility of the estimates of the cyclical component. Moreover, estimating this component of revenue (and the associated output gap) may be quite a complex task, a key reason for its limited worldwide use.

Stabilization/liquidity fund to address volatility in resource earnings

The size of a stabilization/liquidity fund is to be determined mainly by the expected volatility in earnings (due to variations in the resource price), especially the extent of the swings, with just a minimum or no accumulation of funds over the commodity price cycle. Such a fund requires adequate transparency and public oversight to prevent corruption and mismanagement. The fund also needs to be supported by the capacity to develop medium-term forecasts of resource revenues. These funds are in essence self-insurance and may be expensive when weighted against a country's pressing development needs, including a considerable gap in infrastructure and social outcomes (see Annex I). Countries may instead opt for market-based instruments to deal with earnings volatility (e.g., futures contracts) or a minimum liquidity buffer based on, for example, value-at-risk models. But these approaches are, however, technically complex, costly, difficult to explain to stakeholders and politically risky. Therefore, it would seem advisable that resource-rich African countries adopt a stabilization/liquidity fund now that international prices are still relatively high by historical standards. Some countries have already gone this route (Box 4).

[13] Targeting the non-resource or structural primary fiscal balance is more appropriate than targeting the corresponding overall balances because it allows the formulation and assessment of fiscal policy independent of changes in interest payments.

Box 4: African countries with stabilization or wealth funds[1]

This box briefly describes the wealth funds and stabilization funds established by a number of African resource-rich countries.

- **Botswana** adopted in 1994 a Sustainable Budget Index Principle that ensures that resource revenue is invested or saved. Since then, a large stock of savings has been accumulated in its Pula Fund, which is managed by the Bank of Botswana. The fund also acts as stabilization mechanism when resources fall sharply (as occurred in 2009).
- **Nigeria** has adopted a budgetary rule whereby oil revenue is linked to a historical average of oil prices (adjusted in budget negotiations). Excess oil revenue is deposited in the Excess Crude Account. (ECA). Resources from this account can be drawn when revenues are short of the target. This took place in 2009, when oil prices dropped sharply, but it also happened in 2010 and 2011, despite the strong oil price recovery and contrary to ECA's stabilization function. In 2011, Parliament established a Sovereign Wealth Fund (SWF), with three components: a stabilization fund, a fund to finance domestic priority investments, and a fund for longer-term purposes. The SWF became operational in 2012.
- **Ghana** has recently put in place a legal framework governing oil revenue; oil revenue is calculated on the basis of a five year moving average. 70 percent of such revenue will be allocated to the budget and the rest split between a stabilization fund and a heritage fund.
- **Other** resource-rich countries (e.g., Angola, Chad, Guinea, Equatorial Guinea) have accumulated significant assets offshore, without formally establishing a stabilization or wealth fund.

[1]This box draws heavily form IMF, Sub-Saharan Africa, Regional Economic Outlook, April 2012

Wealth fund for inter-generational equity

The exhaustible nature of natural resources calls for inter-temporal decisions about how much resource earnings to consume and invest and how much to save.[14] This decision may involve a difficult socio-political process. While saving a portion of the resource earnings makes sense, a balance has to be found between the welfare of future generations and the immediate need to reduce poverty and invest in physical and human capital, which are critical for building an inclusive society and may well have a high social rate of return. This is especially so for African countries where such expenditure is crucially needed. Similarly, spending those resources beyond the economy's absorptive capacity is not desirable or optimal either because it will lead to the typical distortions associated with Dutch disease.[15] Thus for a lasting impact on development, part of the resource earnings needs to be saved. Moreover, the portion that is to be saved in a wealth fund is closely related to the value society attaches to inter-generational equity and has important implications for short and long-term macroeconomic policies, consistent with fiscal and external sustainability.[16] A priori, the shorter the resource reserve horizon, the more important are the intergenerational (and fiscal sustainability) considerations, and therefore the larger portion or resource earnings to be saved.

[14] Despite their large resource earnings, many resource-rich African countries have had very low saving ratios to GDP.

[15] For instance, most oil-exporting African countries record very high levels of government spending in relation to non-resource GDP (around 50 percent of GDP), thereby generating intense price pressures on domestic resources.

[16] A priori, the shorter the reserve horizon, the more important are the intergenerational (and fiscal sustainability) considerations, and therefore the larger portion or resource earnings to be saved.

Quality of public investment

A further key issue is the quality of the investment financed by the jump in earnings stemming from the resource boom, as this has implications for growth and economic diversification, as well as for building an equitable society with a well-designed social protection system. Many resource-rich African countries need to build up their project formulation and implementation capacity, as well as strengthen their capacity to enhance the quality and effectiveness of education and health services. They also need to increase their absorption capacity. These efforts are critically important and require considerable time to bear fruit. Therefore, there is a need to avoid rushing into wasteful spending, which will certainly hinder achievement of the goals just mentioned.[17] Moreover, rushing may lead to an unwarranted real appreciation of the currency caused by jumps in non-tradable good prices, and thus an otherwise avoidable loss of competitiveness. Once both the absorption capacity of the economy and the ability of government officials to design and implement projects has been built, a cautious use of revenue from natural resources should play an important role in transforming the country.

Because the exploitation of mineral resources does not generally lead to significant increases in employment, given its capital-intensive nature, policymakers need to plan government spending and investment carefully, with a view to foster economic sustainability, including diversification. Enhancing infrastructure and human capital, removing bottlenecks and distortions, and encouraging ancillary activities, non-resource exports and other employment-intensive activities (especially agriculture, agroindustry and services) would help contain the real appreciation of the currency.[18] Moreover, diversification into these activities is critical for long-term development, as, over time, employment in mineral resources is likely to decline in relative (and in some countries in absolute) terms.

The fiscal rules or approaches described above, i.e., the non-resource primary balance and the structural primary balance, are key for fiscal policy to be consistent with the objective of building a wealth fund. The deficits in those balances (minus the overall budget deficit) represent the amount of resource earnings that is being consumed and/or invested by the government. To address the pressing needs that prevail in most resource-rich African countries, it would seem appropriate to target deficits that are somewhat larger in the early years of the resource boom (to enable some scaling up of high priority investment in human and physical capital and in poverty reduction)[19] and smaller in subsequent years, consistent with fiscal and external sustainability. The size of these deficits would also need to take account of the resource reserve horizon of the particular country. The shorter the horizon, the smaller the deficit that can be envisaged in order to avoid an abrupt spending adjustment when resource revenue and/or the intergenerational fund are exhausted, which would disrupt economic activity and the provision of services.

[17] It may also lead to significant governance, rent-seeking and corruption problems, which underscores the need to build and maintain sound institutions.

[18] However, as the country becomes richer with the resource boom, some real appreciation of the currency is unavoidable.

[19] How much larger these deficits could be depends on the absorption capacity of the economy and the project formulation and implementation capacity, which should increase over time, and—linked to these issues—the need to avoid pushing up the price of non-tradable goods.

Having determined the portion of natural resource earnings to save in a wealth fund, countries need to decide how such a fund is to be managed. Chile's Economic and Social Stabilization Fund (ESSF, formerly the Copper Stabilization Fund; see Box 5) and Norway's Oil Fund offer good examples. Similarly, countries will also need to decide whether—and to what extent—it would be advisable that the wealth fund lend to the private sector given that the domestic capital market is underdeveloped, bearing in mind that such lending would add pressures on domestic resources.[20] Along the same lines, countries will need to decide how much to consume and invest from the wealth fund or from its return, balanced against the need to preserve the wealth for future generations.[21]

[20] Transparency and accountability should help direct such lending to socially profitable projects and thus avoid the temptation of lending to entities or individuals just because they are too closely associated with government officials.

[21] An approach based on the permanent income hypothesis would be advisable to guide such a decision, allowing for an initial period of higher spending to address pressing needs, as indicated above.

Box 5: Chile's structural overall balance rule and wealth funds[1]

Chile has been recognized for the rigor and boldness of its macroeconomic management and its ability to weather the boom and bust cycle of its main export, copper. It has applied the kinds of rules outlined in this chapter to deal with the cyclical nature of commodity prices and created two successful wealth funds.

The Structural Overall Balance Rule. Chile started implementing a structural fiscal balance rule in 2001 with the objective of determining the level of fiscal spending consistent with the government's structural revenue. This rule detaches such spending from fluctuations in the copper price, as well as in economic activity and other factors. This allows the government to save in boom times, and thus avoid drastic adjustments to fiscal spending during unfavorable economic periods. While initially implementation of the rule did not have legal backing, it was formalized under the Fiscal Responsibility Law (FRL) in 2006. In 2011, the Ministry of Finance created the Fiscal Council; its main role is to guarantee independence in the estimation of the structural variables and verify the structural balance estimates.

The methodology to calculate the structural balance has been improved over time, mainly to better estimate structural revenue. For example, following the recommendations of an Advisory Committee, the 2011 budget excluded from structural revenue proceeds from temporary tax measures with a legal deadline and cyclical adjustments to other revenue and interest income on financial assets held by the Treasury.

The structural overall balance target has also changed over time. The target was set initially at a surplus of 1 percent of GDP, in order to cover the losses of the Central Bank of Chile. The surplus was reduced to ½ percent of GDP in 2008, as the government considered that the Economic and Social Stabilization Fund had accumulated substantial resources. In 2009, faced with the global crisis, the government reduced the target to zero. (The methodological change of 2011 implied that the 2009 target actually was a deficit of 3 percent of GDP.) The target has been adjusted since then and is expected to converge to a structural deficit of 1 percent in 2014.

The Economic and Social Stabilization Fund (ESSF). The ESSF replaced the Copper Stabilization Fund (which was created in 1985) in 2007, and has the same macroeconomic stabilization objectives, as established by the FRL. The ESSF aims at accumulating excess copper revenues when the price of copper is high in order to transfer resources back to the budget when the price of copper is low, thereby smoothing out government expenditure. The ESSF receives all fiscal surpluses that exceed 1 percent of GDP, the structural fiscal target until 2009 when the government implemented a fiscal stimulus package to counteract the adverse effects of the global crisis. In October 2011, the government adopted a series of measures recommended by a panel of experts to improve the transparency of fiscal policy and to minimize the discretion in its application.

The Central Bank of Chile appoints the members of the Financial Committee; they must have vast experience in the economic and financial areas. The Committee reports to the Ministry of Finance and is responsible for advising the Minister of Finance on long-term investment policy and all other matters related to investment, selecting fund managers, and the contents and structure of the reports of the ESSF. Although the ESSF does not report to Congress, good governance is assured by the fact that Congress decides on the government's budget. The General Treasury produces the Fund's financial statements in accordance with International Financial Reporting Standards.

Management of the ESSF follows the Generally Accepted Principles and Practices, known internationally as the "Santiago Principles," agreed upon by the International Working Group of Sovereign Wealth Funds (IWG-SWF) in Santiago, Chile in September 2008. In 2012 the government published a self-assessment of Chile's compliance with these voluntary principles with a view to improve the publicly available information about the ESSF and to show that it is managed in accordance with best international practices.

As of end-2011, the market value of the assets of the ESSF amounted to US$13.2 billion. As a stabilization fund, it must remain relatively liquid and therefore has to take a short-term view regarding its investments; its return was 5.1 percent in 2011. External managers play a key role in managing the Fund's resources, although the Financial Committee defines the strategic allocations (66.5 percent in sovereign bonds, 30 percent in money market instruments and 3.5 percent in inflation-indexed sovereign bonds; the currency exposure is 50 percent to the US dollar, 40 percent to the Euro and 10 percent to the yen). The Central Bank of Chile prepares daily, monthly, quarterly and annual reports on the state of the Fund and performance of its investments, which are submitted to the Ministry of Finance and the General Treasury.

The Pension Reserve Fund. It was also created in 2007, and its purpose is to address an expected future fiscal shortfall in the area of pensions and social welfare. Specifically, the fund backs the state guarantee for old-age and disability solidarity pension benefits, as well as the solidarity pension contribution, as established by the pension reform. Given its nature, the fund takes a longer-term view for its investments than the ESSF, and therefore it invests in a broader range of assets classes. As of end-2011, the fund had accumulated US$4.4 billion. The fund must receive a minimum annual contribution of 0.2 percent of GDP. If the fiscal surplus exceeds this amount, the contribution can be increased by the amount of the surplus up to 0.5 percent of the previous year's GDP. The Fund is managed in a similar fashion as the ESSF.

[1]See Chile, Ministry of Finance. Chilean Self-Assessment of Compliance with Santiago Principles, January 2012

While discussing the tax regime appropriate for resource-rich countries is beyond the scope of this chapter, taxation on the non-resource sectors of the economy is closely related to the discussion on wealth funds. Many resource-rich countries worldwide reduced the tax burden on these sectors, given the high revenues from resource activities. This reduction (or subsidy) could help diminish the distortions of the tax system, but it would—obviously—lower the portion of resource earnings that could be saved in a wealth fund and, indirectly, add to pressures on domestic resources. Moreover, many countries (e.g., Angola, Mexico, Nigeria, Trinidad and Tobago, and Venezuela) with low tax revenue from the non-resource sectors experienced major adjustment needs and costs when they faced a severe drop in resource earnings due to a major decline in commodity prices. Again, society will need to balance these considerations when deciding on the portion of resource earnings to be saved in a wealth fund.

Monetary and exchange rate framework

The stability/liquidity fund and the wealth fund, to the extent they can be set up and made to work, would help considerably in the conduct of monetary policy, as the first removes the pro-cyclicality of fiscal spending and the second prevents the excessive pressure on domestic resources that a natural resource boom would cause. Similarly, in a more stable macroeconomic environment, exchange rate tensions will be significantly less than otherwise.

The combination of the two funds provide a strong foundation for monetary policy to be based on an Inflation Targeting (IT) Framework, especially given the absence of fiscal dominance (i.e, that government deficits do not condition the growth of money supply). Some African countries already use such a framework with success. Others will require time to develop the conditions necessary for its introduction. The IT framework will allow the implementation of a flexible exchange rate policy, which will, in turn, help reduce the impact of external shocks.[22]

Some resource-rich African countries have a fixed exchange rate or are part of a currency union, most notably those in the West African Economic and Monetary Union (WAEMU) and the Central African Economic and Monetary Union (CAEMU). If these regimes continue, it would be important that credit policy remain cautious and consistent with preserving external competitiveness. The combination of the two funds provides a similar strong foundation for such a policy.

Beyond public finance: promoting a vibrant private sector

Nurturing the development of resource clusters

In addition to sound macroeconomic policies and effective management of public finances through fiscal rules and funds, governments can proactively seek to nurture related-industry clusters to increase the positive spillovers of their natural resource sectors. This will require creating a business-friendly regulatory environment and economy and providing specialized

[22] The argument that a flexible exchange rate regime will lead to an unwarranted appreciation of the currency and that a fixed exchange rate regime will not is misleading. If the conditions for a real appreciation are present, it will happen irrespective of the exchange rate regime: through a nominal and thus real appreciation under the flexible regime or through a rise in the price of non-tradable goods. To avoid such conditions, the key is for policies to create the basis for sustained improvements in competitiveness of the non-resource tradable sectors including through investment in human and physical capital and the removal of bottlenecks and distortions, as discussed above.

targeted infrastructure. For example, a country with offshore oil production might target the development of its port, an efficient low-cost ICT infrastructure and a modern commercial legal framework that favor the installation of service firms for the delivery of services such as offshore platform maintenance, cleaning and hospitality, oil-field geology and crude oil trading. High quality and low cost communications services will allow local firms to bid for projects outsourced from the headquarters of producing companies. Ease of setting up firms and simplified tax procedures will lower the barriers to entry for local entrepreneurs. Availability of visas and work permits for foreign workers will allow them to work locally, facilitating the transmission of skills.

Box 6: Policy measures for resource-rich countries

Using resource rents to create the capital (human, infrastructure, financial) for a diversified economy will require African decision makers to implement four sets of actions.

Actions relating to the natural resource sector:

- **African countries need to obtain a greater share of resource rents**. Better informed negotiations with mining and oil and gas companies, and greater transparency and public accountability to reduce opportunities for corruption
- **African policy-makers must manage their resource rents effectively**, through rigorous macroeconomic management based on fiscal rules to offset boom and bust cycles and make the necessary intergenerational tradeoffs. This is likely to include the creation of stabilization and wealth funds

Actions relating to broader economic management:

- **Fiscal revenues must be invested** to create inclusive development, notably in public infrastructure and human capital
- **African policy-makers need to foster a diversified private sector** alongside its extractive industries to provide the basis for strong, inclusive growth. This will need, in particular, greater integration of Africa's economies

A Vision for Africa's Extractive Industries in 2050

The Vision for Africa in 2050 – factory and granary to the world

In 2050 Africa could be the factory and granary to the world, just as Britain and the US were the factories and the US and Argentina the granaries in the second half of the 19th century, succeeded in the 20th century by China and Australia.

This vision will need Africa's workers, who are young and energetic, to become highly skilled, productive and cost-effective. If it is realized, this vision would confer on African countries highly diversified economies where the extractive industries are only a small part of total output but produce the inputs for its highly competitive manufacturing and service industries.

In this vision Africa will have avoided its resource curse and turned it into a blessing.

Africa's policymakers must set in place the right conditions for convergence now

Resource-rich African countries can converge if they use their resources now to build a diverse economy alongside their extractive industries. If they do this, natural resource rents will over time present a much smaller share of GDP, in part because of the inevitable decline of

extractive industries on the continent between now and 2050 but mostly because of growth in other sectors of the economy.

Policy-makers of resource-rich African countries need to take action on the four measures outlined in Box 6 now, or they are likely to miss an important opportunity for economic convergence. Africa's resource importance is declining compared to other parts of the world, and the fiscal revenue available to African countries from the extractive industries could well decline over the next forty years.

We will examine how each of these measures need be implemented below.

Policy measures to achieve convergence for Africa's resource-rich countries

All African countries with natural resource exports will need to implement the following measures to get onto the convergence path. Two relate specifically to natural resources, the other two relate to broader economic policy.

Natural resource-related policy measures:

1. **Obtain a greater share of resource rents**

   (a) Policy makers must ensure greater transparency in their extractive industries by providing public disclosure of the fiscal and other terms of resource extraction contracts.[23]

   (b) They must call on world-class expertise when negotiating new contracts by obtaining expert services. Financial assistance can be obtained through the facilities managed by the African Development Bank and the World Bank.

2. **Manage their resource rents effectively**

   (a) Policy makers should apply revenue management rules (Non-Resource Primary Fiscal Balance Target or Structural Primary Fiscal Target) to remove cyclicality of resource and non-resource revenues.

   (b) They should implement the monetary policy recommendations outlined earlier in this chapter.

   (c) They should consider the creation of stabilization and wealth funds, managed independently and domiciled in an external bank of international standing.

Broad economic policy measures:

3. **Invest their resource rents to create the basis for sustainable growth**

   (a) Policy makers will need to apply the recommendations found elsewhere in this report, specifically those relating to investment in human capital (health and education) and infrastructure.

[23] Such transparency, involving disclosure of actual fiscal terms, goes beyond EITI which publishes financial flows paid by the private investor to the government, and as such does not provide an estimate of the resource rent sharing.

4. **Foster a diversified private sector**

   (a) They should accelerate economic integration based on a common light-handed regulatory framework across the region, reducing trade barriers and administrative red tape.[24]

   (b) They will need to invest in cost-effective regional infrastructure to achieve geographic integration to bring down logistics costs.

   (c) Educational standards will need to be standardized across the region to enable a greater degree of interoperability between Africa's workers and achieve regional labor force integration.

   (d) Policy makers should set in place much more business-friendly regulations and administrations to nurture indigenous companies and attract foreign investors.

Conclusion

Natural resources are not a hindrance for African countries, even if the relationship between resources and development is very complex. Natural resources do present challenges. They do not provide a shortcut for development. Extraction activities are capital-intensive, do not create much local employment and have few linkages to the rest of the economy. But they also provide opportunities. The fiscal resources from the associated resource rents can be reinvested in essential human capital and infrastructure, and mining, oil and gas can create clusters of related activities that lead to a diversified economy.

Convergence of Africa's economies by 2050 will take more than wise management of its natural resources, however. Integration across the continent will be needed to offset geographic fragmentation. African countries will need to create world class skills through a radically reformed education system. Africa's economies will have to become much more business friendly to enable the creation of local firms. The objective is a diversified, private sector-led economy that will create jobs and inclusive growth. Today the chances are very real that a reform trajectory of the continent could lead us there.

[24] Africa will need to develop to a much greater extent its existing economic areas such as ECOWAS, SADC and COMESA.

Annex 1: African Resource-Rich Countries

Country	Type of Natural Resources	Gross National Income (GNI) Per Capita (in 2010 U.S. dollars)	Natural Resource Exports (in % of Total Exports, average)	Natural Resource Fiscal Revenue (in % of Total Revenue, average, 2006-10)	Human Development Index (2011)	Poverty Headcount at $2/day (in % of population) [25]	Paved Roads (in % of total roads)
Congo, Dem. Rep.	Minerals & Oil	180	94	30	0.29	80	2
Liberia	Gold/Diamond/Iron Ore	210	…	16	0.33	95	6
Niger	Uranium	360	…	…	0.30	76	21
Guinea	Mining Products	390	93	23	0.34	70	10
Mali	Gold	600	75	13	0.36	77	19
Chad	Oil	710	89	67	0.33	83	1
Mauritania	Iron Ore	1,000	24	22	0.45	44	27
Zambia	Copper	1,070	72	4	0.43	82	22
Nigeria	Oil	1,170	97	76	0.46	84	15
Cameroon	Oil	1,200	47	27	0.48	30	8
Sudan	Oil	1,300	97	55	0.41	…	36
Côte d'Ivoire	Oil/gas	1,650	…	…	0.40	46	8
Congo, Rep. of	Oil	2,240	90	82	0.49	74	7
Angola	Oil	3,960	95	78	0.49	70	10
Gabon	Oil	7,680	83	60	0.67	20	10
Equatorial Guinea	Oil	13,720	99	91	0.54	…	…
Sierra Leone	Diamonds	340	…	…	0.34	76	8
Madagascar	Oil/gas	430	…	…	0.48	90	12
Mozambique	Gas/bauxite, etc.	440	…	…	0.32	82	21
Central African Republic	Diamonds/gold	470	…	…	0.34	80	3
Uganda	Oil	500	…	…	0.45	65	23
Tanzania	Gold & precious stones	530	…	…	0.47	88	7
Togo	Phosphate	550	…	…	0.44	69	21

Country	Type of Natural Resources	Gross National Income (GNI) Per Capita (in 2010 U.S. dollars)	Natural Resource Exports (in % of Total Exports, average)	Natural Resource Fiscal Revenue (in % of Total Revenue, average, 2006-10)	Human Development Index (2011)	Poverty Headcount at $2/day (in % of population) [25]	Paved Roads (in % of total roads)
São Tomé and Príncipe	Oil	1,030	…	…	0.51	57	68
Ghana	Gold/oil	1,250	…	…	0.54	54	15
Algeria	Oil	4,390	98	73	0.70	…	73
Botswana	Diamonds	6,750	66	63	0.63	…	33
Libya	Oil	12,320	97	89	0.76	…	57

Source: IMF

[1.] Refers to different years, depending on data availability

Annex 2: Reserves of Oil, Gas and Coal

Oil	**at end 1991**	**at end 2001**	**2010**	**at end 2011**			
	Billion barrels	Billion barrels	Billion barrels	Billion tonnes	Billion barrels	Share of Total	R/P ratio
Algeria	9.2	11.3	12.2	**1.5**	**12.2**	0.7%	19.3
Angola	1.4	6.5	13.5	**1.8**	**13.5**	0.8%	21.2
Chad	-	0.9	1.5	**0.2**	**1.5**	0.1%	36.1
Rep. of Congo (Brazzaville)	0.7	1.6	1.9	**0.3**	**1.9**	0.1%	18.0
Egypt	3.5	3.7	4.5	**0.6**	**4.3**	0.3%	16.0
Equatorial Guinea	0.3	1.1	1.7	**0.2**	**1.7**	0.1%	18.5
Gabon	0.9	2.4	3.7	**0.5**	**3.7**	0.2%	41.2
Libya	22.8	36.0	47.1	**6.1**	**47.1**	2.9%	*
Nigeria	20.0	31.5	37.2	**5.0**	**37.2**	2.3%	41.5
Sudan	0.3	0.7	6.7	**0.9**	**6.7**	0.4%	40.5
Tunisia	0.4	0.5	0.4	**0.1**	**0.4**	[illegible]	15.0
Other Africa	0.8	0.6	2.3	**0.3**	**2.2**	0.1%	27.0
Total Africa	**60.4**	**96.8**	**132.7**	**17.6**	**132.4**	**8.0%**	**41.2**
Total World	1032.7	1267.4	1622.1	234.3	1652.6	1.0	54.2

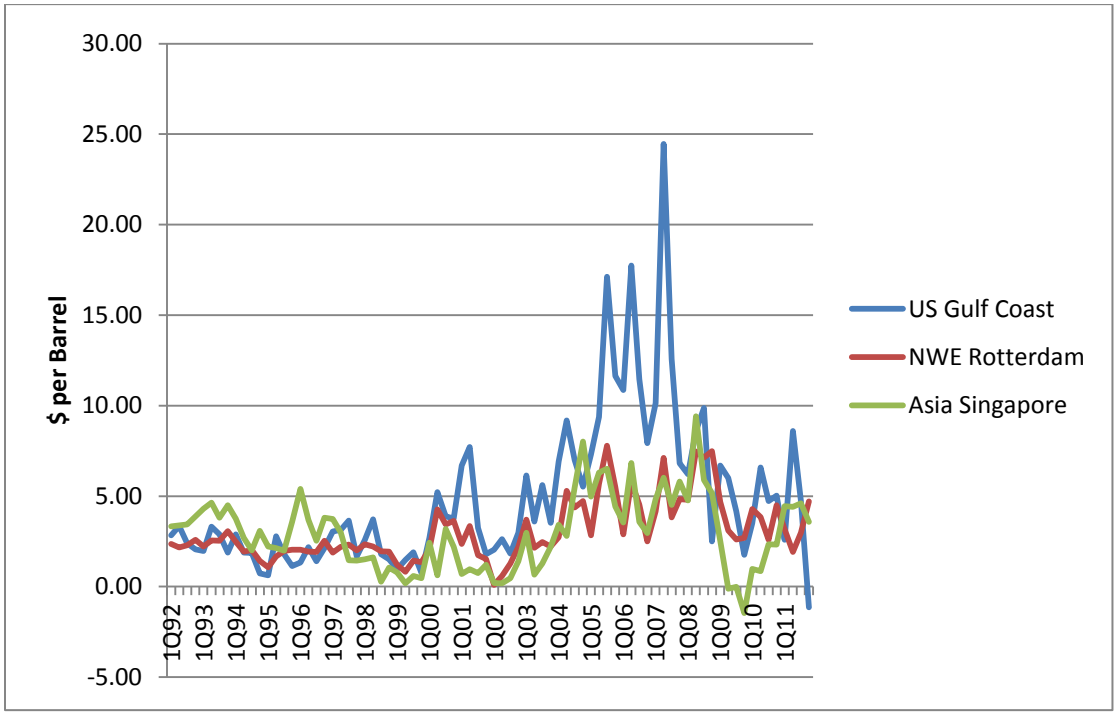
Gas	**at end 1991**	**at end 2001**	**at end 2010**		**at end 2011**		
	Trillion cubic metres	Trillion cubic metres	Trillion cubic metres	Trillion cubic feet	Trillion cubic metres	Share of total	R/P Ratio
Algeria	3.6	4.5	4.5	**159.1**	**4.5**	2.2%	57.7
Egypt	0.4	1.6	2.2	**77.3**	**2.2**	1.1%	35.7
Libya	1.3	1.3	1.5	**52.8**	**1.5**	0.7%	*
Nigeria	3.4	4.6	5.1	**180.5**	**5.1**	2.5%	*
Other Africa	0.8	1.1	1.2	**43.5**	**1.2**	0.6%	63.4
Total Africa	**9.5**	**13.1**	**14.5**	**513.2**	**14.5**	**7.0%**	**71.7**
Total World	131.2	168.5	196.1	7360.9	208.4	1.0	63.6

Coal					
Million tonnes	Anthracite and bituminus	Sub-bituminous and lignite	Total	Share of Total	R/P ratio
South Africa	30156	-	**30156**	3.5%	118
Other Africa	860	174	**1034**	0.1%	*
Total World	**404762**	**456176**	**860938**	**100.0%**	**112**

Annex 3: Geographical Advantage of Crude Oil Refining

In the case of **oil refining**, geographic advantage generally relates to being located close to one of the major spot petroleum product markets which set international prices for traded petroleum products (Rotterdam, Singapore, U.S. Gulf Coast). Export prices for petroleum products in all other localities are determined by subtracting the product transport cost to the closest of these market hubs ("net-back"). Refineries located close to these hubs therefore command a premium because crude transport by sea costs considerably less than product transport, due to the large, relatively unsophisticated maritime vessels used to transport crude oil.

Figure A3: Estimated quarterly refining margin, optimally located refineries



Source: BP Statistical Review

Refining margins in the best geographic locations range between $0/bbl and $5/bbl on average (under 5% of the value of the crude oil). Except under exceptional circumstances, this margin is considerably less than the transport differential between crude oil and refined products for distances like those between West Africa and Rotterdam, so refineries operating in other localities will run at a loss.

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