

TRANSLATING THE EXTRACTIVE RESOURCES TO ECONOMIC GROWTH AND TRANSFORMATION

George Kararach*

ABSTRACT

Most African countries are heavily endowed with natural resources. This gives the continent both the potential for, and threat to, growth/development. Natural resources yield “rents,” or profits from their production, which are crucial for resource-led development. The literature on the “rentier state” and how resource rents interact with institutions and political economy dynamics shows that rent flows through the socio-economic system influence development outcomes. Although the natural resources sector provides significant opportunities for the near term, it also does have significant risks for future generations, and the costs and benefits of resource extraction are seldom borne equitably. Ensuring social equity is a major challenge in natural resource governance, generally falling to governments to referee trade-offs and protect the most vulnerable, including current and future generations. It is critical, therefore, for the continent to address itself to important policy questions to ensure that natural resources are a boon for Africa’s sustainable growth

Keywords: Africa; sustainable growth; rentier state; development.

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1. INTRODUCTION

Africa is a site of vast natural resources, both renewable and non-renewable, with a growth rate of over 5 per cent per annum. Natural resources have become critical to the performance of many of the continent’s economies, and are central to its livelihood systems. They constitute a principal source of public revenue and national wealth. Given the right conditions, a natural resource boom can be an important catalyst for economic growth and socio-economic development, but in Africa this has been true to only a very limited extent. This is largely

* Senior Economist at the Economic Commission for Africa, Addis Ababa, Ethiopia.

due to the failure to establish strong institutions and inclusive growth policies that can deal with global economic volatility, thus making it very difficult for Africa to achieve diversification and sustainable development. Most African economies are non-industrial, therefore, they exist in a staple trap, dependent on exports of a handful of natural resources. More importantly, commodity booms are transitory and prices tend to show some degree of mean reversion over time. Consequently, countries that experience a commodity export price boom are also subject to the high volatility of export prices. In many cases, natural resource booms encourage imprudent fiscal policies and inflation, further hampering growth, equity, and the alleviation of poverty.

Historically, the majority of resource-rich countries tend to have limited transparency in the management of natural resource revenues, leading to the creation of parallel budgets as well as rent-seeking behaviour among the political and business elites. Equally, the latter part of 2014 saw a dramatic fall in the price of oil – a repeat of what happened in the late 1960 – seemingly catching oil exporters unaware and ill-prepared to deal with a rising fiscal gap. These continuing dynamics merit a re-examination of the transformation agenda for Africa. This article argues that the continent needs to address itself to important policy questions: what natural resource governance policies and frameworks are necessary to enhance development prospects in a sustainable way? What broad-brush trends in the global economy does Africa need to emphasize to achieve the sustainability agenda?

Following this brief introduction, the rest of the article is organized as follows: first is a review of Africa's recent experience with commodity booms, then an appraisal of the nexus between natural resources and growth. The concluding section provides some options for the management of natural resources in Africa and thus ends the discourse.

2. AFRICA'S RECENT GROWTH EXPERIENCES: COMMODITY BOOMS AND THE DESIRE FOR TRANSFORMATION

Africa's real GDP rose by 4.9 percent a year, from 2000 through 2008, more than twice its pace during the 1980s and 1990s. Over this period, six out of ten of the world's fastest growing economies were in Africa. Africa's gross domestic product (GDP) growth was expected to strengthen to 4.5 per cent in 2015 and 5 per cent in 2016 after subdued

expansion in 2013 (3.5 per cent) and 2014 (3.9 per cent).¹ This has altered the narrative on the continent's development prospects. Long viewed as an economic basket case, the continent is now regarded as the *next frontier* in terms of foreign investment. Absolute poverty has failed to decline, with the number of poor Africans being higher than ever. This might confirm the impression that the continent is moving at multiple speeds, and this raises serious questions about the inclusivity of the recent growth performance.

It is also doubtful whether the growth performance is sustainable, since it is often driven by a combination of external factors (aid, debt relief, commodity windfalls), as well as the removal of some of the more egregious policy distortions of the past, including price controls and related state restrictions. Domestic productivity has been given a boost by an increase in demand for domestic goods and services as a middle class emerges,² alongside a more efficient use of resources. However, it is unclear where future productivity gains will come from.³ Part of the problem resides in an incomplete structural transformation. African economies have remained predominantly agrarian and undiversified, exporting a limited range of commodities. Researchers at the African Centre for Economic Transformation in Accra, Ghana, recently described the continent as growing rapidly but transforming slowly.⁴ Indeed, the very essence of this problem resides in a vast extraction of natural resources coupled with the absence of domestic employment creation.

Half the current population of sub-Saharan Africa is under 25 years of age, and each year between 2015 and 2035, there will be half a

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- 1 African Development Bank, Organization for Economic Co-operation and Development, United Nations Development Programme, Economic Commission for Africa, *African Economic Outlook 2013, Structural Transformation and Natural Resources*, (AfDB, 2013); African Development Bank Group, *African Development Report 2012, Towards Green Growth in Africa* (AfDB, Tunis, 2012); International Monetary Fund, *Regional Economic Outlook: Sub-Saharan Africa* (Washington DC: IMF October Issue, 2014).
 - 2 Mthuli Ncube and Abebe Shimeles, "The Making of the Middle Class in Africa", (African Development Bank, 2012).
 - 3 (Rodrik, 2014) Dani Rodrik, "An African Growth Miracle?" Paper Written for the Centre for Global Development, Richard H. Sabot Lecture, (2014). <http://www.sss.ias.edu/files/pdfs/Rodrik/Research/An_African_growth_miracle.pdf>
 - 4 African Centre for Economic Transformation (ACET), *Africa Transformation Report 2014 – Growth with Depth* (Accra: ACET, 2014).

million more 15-year-olds than the year before.⁵ The World Bank forecasts that over the next decade only one in four African youths will be employed as a salaried worker, with only a small fraction in the formal sector, emphasizing jobless growth.⁶ The growth trends have merely raised young people's expectations of good jobs without expanding the capacity to deliver them; forming ideal conditions for social protest and political instability.

African countries are highly dependent on commodities exports. Apart from cocoa, sugar and gold, most commodities experienced a steep price increase in 2008 that was followed by a sharp decrease in 2009, due to global recession. The higher commodity prices in 2008 affected the African current account positively, as key exports exceeded imports by US\$319 billion, compared to US\$192 billion in 2008. Nevertheless, the impact is highly dependent on the type of commodity.⁷

Despite having large reserves of natural resources (with about 30 per cent of the world known reserves of minerals, 10 per cent of oil and 8 per cent of gas resources, and largest cobalt, diamonds, platinum, and uranium reserves in the world),⁸ African countries rely heavily on commodity imports, especially oil and cereals. Generally, the world market prices for oil and natural gas tend to be more volatile than those for other minerals and agricultural commodities. A number of authors, including Blattman, Hwang, and Williamson,⁹ and Poelhekke

5 Deon Filmer and Louise Fox, "Youth Employment in Sub-Saharan Africa", (Washington DC: World Bank, 2014).

6 Kobena Hanson. And Frannie Leautier, "Jobless Economic Growth in Africa: Is There a Role for Agriculture?", *Journal of African Development*, Volume 15(2), (2013).

7 Thouraya Triki and Youssef Affes, "Managing commodity price volatility in Africa", AfDB Africa Economic Brief, Volume 2(12), September, (2011).

8 The African Development Bank estimates that extractive resources will contribute over USD 30 billion per annum in government revenue for the next 20 years. See AfDB (2015): African Natural Resources Center (Anrc) Strategy (2015 – 2020) Revised Version. <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_Natural_Resources_Center%E2%80%99s_Strategy_for_2015-2020.pdf>

9 Christopher Blattman, Jason Hwang, and Jeffrey Williamson, "Winners and losers in the commodity lottery: The impact of terms of trade growth and volatility in the Periphery 1870-1939", *Journal of Development Economics (Elsevier)*, Vol. 82(1), pp. 156-179, January (2007).

and van der Ploeg,¹⁰ have suggested that this adversely affects growth. In the case of oil, the relatively small fluctuations in demand require a large change in price to re-equilibrate supply and demand. This (coupled with security concerns) explains why the procurement of energy inputs is often controlled by government agencies. Unfortunately, and in the absence of hedging, new purchases are exposed to higher prices on the spot market. A notable exception was Ghana, which adopted a commodity price risk management policy in 2010 while most African countries do not actively manage price risk, thus exposing themselves to negative effects of price volatility. The National Oil Companies (NOCs) and private oil companies jointly oversee export activities. The degree of NOCs' exposure depends on the contract signed with their private partners, as well as their production levels at any given time. For example, Algeria operates a production sharing agreement where the government retains 51 per cent, while the government of Cameroon retains only 20 percent participation through its NOC.¹¹

Over-reliance on natural resources for exports exposes countries to high volatility. Evidence by Poelhekke and van der Ploeg¹² has shown that countries with a large share of natural resource exports in GDP tend to have a high volatility in output growth. Among the reasons for this is that these countries tend to specialize in a few volatile sectors.¹³ State marketing boards act as monopolies in the export of agricultural and other commodities and have a long tradition of paying producers fixed prices and selling at international rates. Since the abolition of marketing boards in the 1980s, some cooperatives, such as the Kilimanjaro Native Co-operative Union (KNCU) in Tanzania, have become increasingly engaged in export markets.¹⁴ Cooperatives guarantee a minimum price to farmers, which then exposes them to

10 Steven Poelhekke and Frederick van der Ploeg, "Volatility, financial development and the natural resource curse", CEPR DP6513, October, (2007).

11 Available at <<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/WPM37NorthAfricanOilandForeignInvestmentinChangingMarketConditions-BassamFattouh-2008.pdf>> accessed 22 March, 2016.

12 Poelhekke and van der Ploeg (n 10).

13 Miklos Koren and Silvana Tenreyro, "Volatility and development", *The Quarterly Journal of Economics*, Vol. 122(1), pp. 243-287, (2007).

14 Jerome Afeikhena and Ogunkola Olawale, "Characteristics and behavior of African commodity/Product markets and market institutions and their consequences for economic growth", Working Paper No. 35, Center for International Development, Harvard University (2000).

downside risks. Most cooperatives no longer actively hedge their price risk because of the legal reforms defining their role in the context of market liberalization.¹⁵

In the face of global volatility, the question arises on whether private companies who partner with NOCs, should hedge. For example, Exxon Mobil does not do so, while Shell reportedly hedges its entire production.¹⁶ Risk management practices also vary across African NOCs. The bigger firms such as Sonatrach (Algeria), Sasol (until recently owned by the South African government) and Sonangol (Angola) have been actively managing oil price risk through options, swaps and structured oil-backed financing. However, the smaller NOCs are less active to hedging price risk. Governments do not dominate the market for minerals and metals to the same extent, and a key selling point of many “junior” mining companies is that they do not hedge, while larger players reportedly do so to varying extents.¹⁷

The demand for commodities is growing fastest in the world’s emerging markets, particularly in Asia, Latin America and the Middle East. Despite longstanding historical ties with Europe, Africa now conducts half its trade with developing economic regions (the so-called South-South exchanges). From 1990 to 2008, Asia’s share of African trade doubled, to 28 percent, while Western Europe’s portion shrank from 51 per cent to 28 per cent.¹⁸ As of mid-2012 Asia became the third-biggest destination for sub-Saharan Africa’s non-oil exports after sub-Saharan Africa itself and Europe (the European Union and the countries of the European Free Trade Agreement).¹⁹

This geographic shift in trade concentration provides new grounds for economic relationships through which African governments are increasingly able to strike multiple long-term deals at once. China, for example, has bid for access to 10 million tons of copper and 2 million tons of cobalt in the Democratic Republic of the Congo in exchange for

15 Lamon Rutten and Frida Youssef, “Market-based price risk management: An exploration of commodity income stabilization options for coffee farmers”, Winnipeg, International Institute for Sustainable Development (2007).

16 Triki and Affes, (n 7).

17 Triki and Affes, (n 7).

18 McKinsey Global Institute, 2010 *Lion on the Move; The Progress and potential of African Economies*. Washington. <www.mckinsey.com/.../McKinsey/.../Lions%20on%20the%20move%20The>

19 International Trade Centre (ITC), “Africa’s Trade Potential: Export Opportunities in Growth Markets”, Geneva: ITC, xi, 43 pages (Technical paper) (2012).

a US\$6 billion package of infrastructure investments, including mine improvements, roads, rail, hospitals, and schools.²⁰ As of 2010, US\$6 billion of the deal had been finalized with another US\$3 billion, targeted at mine improvements, roads, rail, hospitals, and schools, still under discussion.²¹ India, Brazil, and the Middle East are also building new broad-based investment partnerships in Africa, including areas such as agriculture.²²

The resurgent global scramble for commodities also gives African governments more bargaining power and opportunities for negotiating better deals that capture more value from these resources and enhance beneficiation.²³ Commodity buyers are now increasingly willing to make up-front payments (in addition to resource extraction royalties) and to share management skills and technology.²⁴ Africa is furthermore gaining access to international capital. The annual flow of foreign direct investment into Africa increased from US\$9 billion in 2000 to US\$62 billion in 2008, declining because of the global financial crisis to US\$54 billion in 2015 – relative to GDP – almost as large as the flow into China. Africa’s resource sectors have attracted most new foreign capital, but FDI in tourism, textiles, construction, banking, and telecommunications also increased.²⁵ Remittances became a major source of development finance and have surpassed ODA since 2011, reaching about US\$33 billion by end of 2014.²⁶

20 McKinsey Global Institute, “What is driving Africa’s growth” (2010). <<http://www.mckinsey.com/global-themes/middle-east-and-africa/whats-driving-africas-growth>> accessed 22 March, 2016.

21 McKinsey Global Institute (n 20).

22 Christopher Alden and Maxi Schoeman, “South Africa in the company of giants: the search for leadership in a transforming global order”, *International Affairs*, Vol. 89(1), (2013).

23 Countries like Uganda and South Sudan have developed laws that put value-addition and beneficiation at core development contracts being signed with mining companies.

24 McKinsey Global Institute (n 18).

25 McKinsey Global Institute (n 18).

26 African Development Bank, African Natural Resources Center (ANRC) Strategy (2015-2020) Revised Version (2015). <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_Natural_Resources_Center%E2%80%99s_Strategy_for_2015-2020.pdf>

3. UNDERSTANDING THE NATURAL RESOURCES AND GROWTH NEXUS – WHAT THE LITERATURE SUGGESTS

Given the centrality of natural resources in many African economies, it is important to discuss the growth-natural resource nexus. Much of the literature attempts to establish linkages between natural resources, volatility and growth, concentrating on the relationship between resource abundance and economic performance. Observers believe that reliance on natural resources has adverse consequences for economic growth, and a large number of studies have provided evidence that supports this resource curse hypothesis, including Auty,²⁷ Lal and Myint,²⁸ and Sachs and Warner.²⁹ Rosser,³⁰ Haber and Menaldo³¹ provide more recent evidence on this relationship. Using a sample of 95 countries, covering the period 1970-90, Sachs and Warner³² identified a clear relationship between natural resource based exports and economic growth, which they confirmed in subsequent studies.³³ Similarly, Auty³⁴ finds that resource-poor countries grow almost three times faster than

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- 27 Richard Auty, “Resource-based industrialization and country-size: Venezuela and Trinidad and Tobago”, *Geoforum* 17 (1986); Richard Auty, *Sustaining Development in Mineral Economies: The Resource Curse Thesis* (Oxford University Press, New York) (1993); and Richard Auty, “Introduction and overview”, in Richard Auty (ed.) *Resource Abundance and Economic Development* (Oxford: Oxford University Press, 3-16, WIDER Studies in Economic Development) (2001a).
- 28 Deepak Lal and Hla Myint, *The Political Economy of Poverty, Equity and Growth* (Oxford: Clarendon Press) (1996).
- 29 Jeffrey Sachs and Andrew Warner, “Natural Resource Abundance and Economic growth”, Centre for international Development and Harvard Institute for International Development, Harvard University, Cambridge MA (1997).
- 30 Micheal Ross, “How Mineral States Can Reduce Inequality”, in Humphreys, M., J. D. Sachs and J. E. Stiglitz (eds.), *Escaping the Resource Curse*. New York: Columbia University Press (2007).
- 31 Stephen Haber and Victor Menaldo, “Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse”, *American Political Science Review*, February (2011).
- 32 Sachs and Warner, (n 29).
- 33 Jeffrey Sachs and Andrew Warner, “The Big Push, Natural Resource Booms and Growth”, *Journal of Development Economics*, 59, 43-76 (1999a); Jeffrey Sachs and Andrew Warner, “Natural Resource Intensity and Economic Growth”, in Mayer J., B. Chambers and A. Farooq (eds.), *Development Policies in Natural Resource Economics*, Edward Elgar (1999b).
- 34 Auty (2001a, n 27).

the resource-abundant, a phenomenon known in development literature as the Dutch disease.

3.1 Dutch Disease

In its broadest sense, Dutch disease has to do with the negative macroeconomic effects associated with the resource curse. It is an economic phenomenon in which the discovery and exploitation of natural resources leads to the de-industrialization of a nation's economy. This happens as a result of the resource-revenue inflows which lead to the country's currency rises and domestic spending patterns and other internal resource allocation effects that make tradable manufactured goods and other tradable sectors, including parts of agriculture, less competitive. The contraction of manufacturing and the tradable sector in general leads to slow growth, implying that the natural resource sector lacks positive externalities.³⁵

Why are these adjustments problematic for economic development? First, in the event that the complete cycle is not adequately foreseen, any decline in the world price of the export commodity can cause difficult and painful reversals or adjustments towards initial conditions. Second, even if the perceived longevity of the increase in world price is validated, the crowding out of non-commodity exports is undesirable, perhaps because the manufacturing sector has greater externalities for long-run growth.³⁶ In this case, an example of the cost of crowding out manufacturing is high commodity prices that are resultant and not cyclical fluctuations per se.

A number of studies³⁷ have observed a lack of evidence to show that a decline in manufacturing has a negative effect on growth, and

35 Sachs and Werner (n 29).

36 Sweder van Wijnbergen, "The "Dutch Disease": A Disease After All?", *Economic Journal* 94: 41-55 (1984); Kiminori Matsuyama, "Agricultural Productivity, Comparative Advantage, and Economic Growth", *Journal of Economic Theory* 58, December, 317-334 (1992); and Thorvaldur Gylfason, Tryggvi Thor Herbertsson and Gylfi Zoega, "A Mixed Blessing", *Macroeconomic Dynamics*, 3: 204-225 (Cambridge University Press) (1999).

37 Richard Auty, "Industrial policy reform in six large newly industrialized countries: The resource curse thesis", *World Development*, 12(1): 11-26, (1994); Jean-Philippe Stijns, "Natural Resource Abundance and Economic Growth revisited", University of California (2001).

Leite and Weidman,³⁸ Mikesell³⁹ and Wright and Czelusta⁴⁰ question the empirical basis of the theory. Otaha,⁴¹ and Hodge,⁴² on the other hand, demonstrate the existence of the Dutch disease in Nigeria and South Africa.

3.2 Revenue Volatility

Revenue from oil, gas and mineral resources is very volatile, driven by fluctuations in prices, sometimes over very short periods of time. There is plenty of empirical support for this. Poelhekke and van der Ploeg⁴³ show that the resource curse is mainly a problem of volatility. According to these authors, “the high volatility of world prices of natural resources causes severe volatility of output per capita growth in countries that depend heavily on them”. If sustained, this can have long-term negative effects that can be viewed as a “curse.” The nature and effects of revenue volatility are very similar to those described under the Dutch disease and conflicts over rents and thus do require further elaboration.

3.3 Competition Over Rents

Rent-seeking behaviour concerns how people compete for transfers from the extractive minerals and other sectors, some of which are artificial. Most studies examine the behaviour of interest groups seeking to capture transfers created by the government. Torvick⁴⁴ presents a

38 Carlos Leite and Jens Weidmann, “Does mother nature corrupt? Natural resources, corruption, and economic growth”, in Abed, George T. and Gupta, Sanjeev (eds) *Governance, corruption, and economic performance*. Washington, DC: IMF, 159-196 (2002).

39 Raymond Mikesell, “Explaining the Resource Curse, with Special Reference to Mineral-Exporting Countries”, *Resources Policy*, Vol. 23, Issue 4, December, pp. 191-199 (1999).

40 Gavin Wright and Jesse Czelusta, “Mineral Resources and Economic Development”, Conference on Sector Reform in Latin America, Stanford Center for International Development, November (2003).

41 Jacob Imo Otaha, “Dutch Disease and Nigeria Oil Economy”, *Africa Research Review: An International Multidisciplinary Journal*, Ethiopia Vol. 6 (1), Serial No. 24, January (pp. 82-90) (2012).

42 Duncan Hodge, “The Exchange Rate, Dutch Disease and Manufacturing in South Africa: What do the Data Say?”, ERSA Working Paper No. 281 (2012).

43 Poelhekke and van der Ploeg (n 10).

44 Ragner Torvick, “Natural Resources, Rent Seeking and Welfare”, *Journal of Development Economics*, Vol. 67 (2002).

model where the number of entrepreneurs engaged in rent seeking increases with the amount of natural resources available, and the entrepreneurs running productive firms become fewer. The result is that government expenditure creates no social value; instead it distorts the market and the functioning of the economy. There is a general consensus that rent-seeking behaviour has an undesirable effect on the economy.⁴⁵ The existence of large oil or gas revenue creates an environment for rent-seeking to thrive. The disproportionate representation of resource-rich countries among those with high capital flight is further evidence of the volatility. This is made worse by the tax evasion of multinationals operating in these countries. The ultimate effect of rent seeking will however depend on how and where the proceeds are invested.

3.4 Quality of Institutions and Policies

The lack of strong institutions has been identified as one of the key reasons for the existence of resource curse. Mehlum et al,⁴⁶ quoted by Torress et al,⁴⁷ contends that better institutions can avoid the resource curse, but natural resources can in turn affect institutional quality. In another study, Isham *et al*,⁴⁸ confirm that while natural resource abundance has no direct impact on growth, it can affect institutional quality, but only when resources are geographically concentrated, such as with oil.

Some studies focus on outright corruption.⁴⁹ They stress the

45 Daniel Lederman and William Maloney, "In Search of the Missing Resource Curse", *Economia* 9, No. 1, Fall (2008).

46 Halvor Mehlum, Karl Moene and Ragnar Torvik, 2006, "Institutions and the Resource Curse", *Economic Journal*, 116, 508, 1-20 (2006).

47 Nuno Torres, Óscar Afonso and Isabel Soares, "A survey of literature on the resource curse: Critical analysis of the main explanations, empirical tests and resource proxies", *CEFUP, Faculty of Economics, University of Porto*; CEFUP Working Paper 2013-02 (2013).

48 Jonathan Isham, Michael Woolcock, Lant Pritchett and Gwen Busby, "The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth", *The World Bank Economic Review* (Oxford University Press on behalf of the International Bank for Reconstruction and Development) (2005).

49 Roland Hodler, "The Curse of Natural Resources in Fractionalized Countries", *European Economic Review* 50, No. 6, 1367-86 (2006); Francesco Caselli, "Power Struggles and the Natural Resource Curse", LSE Research, London School of Economics (2006); Carlos Leite and Jens Weidman, "Does Mother Nature

negative impact on growth of rent-seeking activities.⁵⁰ Torvik⁵¹ presents a model where rent seeking associated with natural resources abundance diverts entrepreneurs away from productive enterprises. The resulting drop in income is higher than its increase from the natural resource extraction. Therefore, more natural resources lead to lower welfare. Auty's⁵² rent-cycling theory differs slightly by holding that economic growth necessitates a recycling of rents via markets rather than patronage. In high-rent-seeking countries, the natural resource elicits a political contest to capture ownership, with the possibility of protracted conflict, as seen in the Niger Delta and Eastern DRC, whereas in low-rent-seeking countries the government motivates people to create wealth by pursuing comparative advantage, promoting equality, and fostering civil society.

The theory is extended to explain how natural resource booms may undermine democratic institutions, as governments' access to rents in the form of windfall revenue, may free them from the need to tax their populations, which in turn frees them from any obligation to act democratically.⁵³ A number of studies reinforce the argument that

Corrupt?", *IMF Working Paper 99/85*, July (1999); Elissaios Papyrakis and Reyer Gerlagh, "The resource curse hypothesis and its transmission channels", *Journal of Comparative Economics*, 32(1), 181-193, (2004); Rabah Arezki and Markus Brückner, "Oil Rents, Corruption, and State Stability: Evidence From Panel Data Regressions", *IMF Working Papers 09/267*, International Monetary Fund. University of Adelaide, School of Economics WP No. 2011-07 (2009).

50 Torvik (n 44); James Robinson, Ragnar Torvik and Thierry Verdier, 2006, "Political Foundations of the Resource Curse", *Journal of Development Economics*, 79, No. 2, 446-68 (2006); Martin E. Sandbu, "Natural Wealth Accounts: A Proposal for Alleviating the Natural Resource Curse", *World Development*, 34(7), 1153-70 (2006).

51 Torvik (n 44).

52 Richard Auty, *Resource-based Industrialization: Sowing the Oil in Eight Developing Countries*, Oxford: Clarendon Press (1990); Auty, (2001a, n 27); Richard Auty, "Patterns of Rent-Extraction and Deployment in Developing Countries: Implications for Governance, Economic Policy and Performance", in George Mavrotas and Anthony Shorrocks, editors, *Advancing Development: Core Themes in Global Economics* (Palgrave: London), 555-577, (2007).

53 See Hossein Mahdavi, "The Patterns and Problems of Economic Development in Rentier States: The case of Iran", in Cook, M. (ed.), *Studies in the Economic History of the Middle East*, Oxford: Oxford University Press (1970); Giacomo Luciani, "Allocation versus Production States: A Theoretical Framework", in Hazem Beblawi and Giacomo Luciani, eds., *The Rentier State* (Croom Helm: New York) (1997); and Dirk Vandewalle, *Libya Since Independence: Oil and State-Building* (Cornell University Press: Ithaca NY) (1998).

economic dependence on oil or minerals is correlated with authoritarian government.⁵⁴ Other studies reject the causal link between resources and lack of democracy.⁵⁵ The type of natural resource may affect the institutional context.⁵⁶ Leite and Weidmann⁵⁷ found no direct impact of natural-resource abundance on economic growth from 1970 to 1990, but showed an important indirect effect through the impact of those resources on corruption, which, in turn, negatively affects growth.⁵⁸

Isham *et al.*,⁵⁹ and Sala-i-Martin and Subramanian,⁶⁰ confirm Mauro's⁶¹ results by examining the influence of natural resources on broader indicators of institutional quality and policies. Natural resource abundance undermines growth indirectly through institutional quality, but only when resources are geographically concentrated (resource points).

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- 54 Robert Barro, "Inequality and Growth in a Panel of Countries", *Journal of Economic Growth*, 5: 5-28, (2000); Michael Ross, "Does Oil Hinder Democracy?", *World Politics* 53, No. 3, 325-61 (2001); Leonard Wantchekon, 2002, "Why do Resource Dependent Countries Have Authoritarian Governments?" *Journal of African Finance and Economic Development*, 2, 57-77, (2002); Michael Ross, Michael, 2006, "A Closer Look at Oil, Diamonds, and Civil War," *Annual Review of Political Science*, 9, 265-300, (2006); Benjamin Smith, "Oil Wealth and Regime Survival in the Developing World, 1960-1999", *American Journal of Political Science*, 48(2), 232-246, (2004); Benjamin Smith, *Hard Times in the Lands of Plenty*. Ithaca, NY: Cornell University Press, (2007); Nathan Jensen and Leonard Wantchekon, "Resource Wealth and Political Regimes in Africa", *Comparative Political Studies*, 37, 816-41, (2004); Jamy Ulfelder, "Natural Resource Wealth and the Survival of Autocracies", *Comparative Political Studies*, 40, 8, 995-1018 (2007).
- 55 See Terry Lynn Karl. 1997. *The Paradox of Plenty: Oil Booms and Petro-States* (University of California Press: Berkeley CA) (1977); Thad Dunning, *Crude Democracy: Natural Resource Wealth and Political Regimes* (Cambridge University Press: New York) (2008); Marcus Noland, "Explaining Middle Eastern Political Authoritarianism I: The Level of Democracy," *Review of Middle East Economics and Finance*, 4, No. 1 (2008); Romain Wacziarg, "The First Law of Petropolitics," UCLA, April (2009); and Haber and Menaldo (n 31).
- 56 Auty (2001a, n 27), Richard Auty, "Conclusions: resource abundance, growth collapses, and policy", in Auty, Richard M. (ed.), *Resource abundance and economic development*. Oxford: Oxford University Press, 315-328 (WIDER Studies in Economic Development) (2001b); Ross, (n 54); Torres *et al.* (n 47).
- 57 Leite and Weidmann (n 38).
- 58 E.g., Paolo Mauro, "Corruption and Growth", *Quarterly Journal of Economics*, 110(3), 681-712 (1995).
- 59 Isham *et al* (n 48).
- 60 Xavier Sala-I-Martin and Arvind Subramanian, "Addressing the Natural Resource Curse: An Illustration from Nigeria." *IMF Working Paper WP/03/139* (2003).
- 61 Mauro (n 58).

Where government makes bad decisions, partly to meet high population expectation or because they find themselves with large reserves that weaken their prudence and control, windfall resources do not have any social value.⁶² They may prompt governments to adopt inappropriate policies that stifle rather than promote industrial development. According to Krause⁶³ and Mikesell,⁶⁴ many countries failed to convert the oil booms of the early 1970s and 1980s into meaningful industrial development. Similarly, booms in resource revenues may prompt countries to introduce subsidy programmes, which turn out to be unsustainable or protectionist in the long run.⁶⁵ Sachs and Werner⁶⁶ found a positive correlation between dependency, primary products and closed trade regimes, including those in Africa.

3.5 Resource Curse

Oil, minerals, and agricultural resources can bring great riches to those who possess them – especially in the event of booms,⁶⁷ yet countries that are abundantly endowed with such natural resources have tended to deliver disappointing economic performance.⁶⁸ This phenomenon can be cyclical, but it can also be permanent: countries endowed with natural resources develop social structures in which autocratic or corrupt political elites finance themselves through physical control of the natural resources.⁶⁹ As Frankel⁷⁰ noted, price-taking requires three

62 Paul Stevens, “Resource Impact: Curse or Blessing? A Literature Survey,” *Journal of Energy Literature*, 9, No. 1, 1-42, (2003).

63 Lawrence Barry Krause, “Social Capability and Long-term Economic Growth”, in Koo, B.H. and Perkins, D.H. (eds), *Social Capability and Long-term Economic Growth*, New York: Macmillan (1995).

64 Mikesell (n 39).

65 Richard Auty, “Industrial policy reform in six large newly industrialized countries: The resource curse thesis”, *World Development*, 12(1): 11-26 (1994).

66 Sachs and Werner (n 29).

67 Jeffrey Frankel, “The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions”, HKS Faculty Research Working Paper Series RWP12-014, John F. Kennedy School of Government, Harvard University (2012a).

68 William Easterly and Ross Levine, “Africa’s growth tragedy: Policies and ethnic divisions.” *Quarterly Journal of Economics*, Vol. 112, (1997); Sachs and Warner, (n 29), Auty (2001a, n 27); Economic Policy Research Centre (Uganda), KIPPRA and Brookings Institution (2013). “Oil and gas management for inclusive and sustainable development: An East African Regional Forum”, Proceedings Report, (2013).

69 Frankell (n 67).

70 Frankel (n 67).

general conditions: low monopoly power, low trade barriers, and intrinsic perfect substitutability in the commodity as between domestic and foreign producers – a condition usually met by primary products, and not by manufactured goods and services. Kalecki⁷¹ argues that developing economies are flex-price due to limited monopolistic structures in their productive sectors, and thus vulnerable to volatility in prices and demand in the world market.

3.6 The Prebisch-Singer Hypothesis

The Prebisch-Singer hypothesis⁷² asserts that the prices of mineral and agricultural products follow a downward trajectory in the long run, relative to the prices of manufactures and other products. Essentially, the world demand for primary products is perceived to be inelastic with respect to world income. The Prebisch-Singer hypothesis tends to support the conclusion that the growth prospects of resource-based economies diminish, due to the long-term price trends. To ameliorate this situation, Prebisch and Singer urged developing countries to limit engagement in international trade with tariff and non-tariff barriers, in order to allow their domestic manufacturing sector to develop behind protective walls. The import substitution industrialization (ISI) policy adopted in much of the developing world in the 1950s through the 1970s is no longer espoused today.

There are persuasive theoretical arguments to show that prices of oil and other minerals experience upward trends in the long run. They assume that these are non-perishable, non-renewable resources, which are not exploited under conditions of legal uncertainty over ownership. If the fixed deposits of oil or any other minerals in the earth's crust are all sufficiently accessible that the costs of exploration, development and extraction are small compared to the value of the oil, one arrives at the conclusion that the price of oil in the long run should rise at a rate equal to the world interest rate⁷³ because at every point in time

71 Michal Kalecki, *Essays on Developing Economies*. Hassocks, Harvester Press (1976).

72 Raul Prebisch, *The Economic Development of Latin America and Its Principal Problems* (New York) (1950); and Hans W Singer, "US Foreign Investment in Underdeveloped Areas: The Distribution of Gains between Investing and Borrowing Countries," *American Economic Review, Papers and Proceedings*, 40, May: 473-485 (1950).

73 Harold Hotelling, "The Economics of Exhaustible Resources," *Journal of Political Economy*, 39, No. 2, 137-75 (1931).

the owner of the oil or mineral claim controls how much to extract or leave in the ground.

Whatever is pumped can be sold at today's price (this is the price-taker assumption) and the proceeds invested in bank deposits or US Treasury bills, which earn the current interest rate. If the value of the commodity is not expected to increase in the future, then the owner has an incentive to extract more of it today, so that it can earn interest on the proceeds. As mining companies worldwide react by extracting more today, they drive down the current price of oil below its perceived long-run level. When this happens, companies will expect that the price must rise in the future contradicting Prebisch-Singer. Only when the expectation of future appreciation is sufficient to offset the interest rate will the oil market be in equilibrium.

Notably, supply of these commodities is not immutable, even though at any point in time there is a certain stock of mineral reserves that have been discovered. However, experience shows that, as this stock is depleted, new reserves are found.⁷⁴ When the price goes up, and new technology is developed, it becomes profitable to prospect for deposits that are more difficult to extract. So what is the overall statistical trend in the long run? The jury seems to be out! Some studies find a slight upward trend, some a slight downward one.⁷⁵ The econometric evidence

74 Giovanni Melina and Yi Xiong, "Natural Gas, Public Investment and Debt Sustainability in Mozambique", IMF Working Paper, WP/13/261, November (2013). <<http://www.imf.org/external/pubs/ft/wp/2013/wp13261.pdf>> accessed 14 June 2014.

75 John Cuddington, John, "Long-Run Trends in 26 Primary Commodity Prices," *Journal of Development Economics*, 39, 207-27, (1992); John Cuddington and Daniel Jerrett, "Super Cycles in Real Metals Prices?" IMF Staff Papers, 55, December, 541-565, (2008); John Cuddington, Rodney Ludema and Shamila Jayasuriya, "Prebisch-Singer Redux," in *Natural Resources: Neither Curse Nor Destiny* (Stanford University Press, Palo Alto, and World Bank, Washington DC): 103-140, (2007); John Cuddington and Carlos M. Urzua, "Trends and Cycles in the Net Barter Terms of Trade: A New Approach," *Economic Journal*, 99: 426-42, (1989); Enzo Grilli and Maw Cheng Yang, "Primary Commodity Prices, Manufactured Goods Prices, and the Terms of Trade of Developing Countries: What the Long Run Shows," *World Bank Economic Review*, 2, No. 1, 1-47 (1988); Yael Hadass and Jeffrey Williamson, "Terms of Trade Shocks and Economic Performance 1870-1940: Prebisch and Singer Revisited," *Economic Development and Cultural Change* (University of Chicago Press), Vol. 51(3), pages 629-56, April (2003) and NBER WP 8188, 2001; Neil Kellard and Mark Wohar, "On the prevalence of trends in primary commodity prices," *Journal of Development Economics*, 79, No. 1, February, 146-167 (2006); Robert Pindyck,

seems to depend on the end-date of the sample period. After the commodity price increases of the 1970s studies found an upward trend, but those written after the 1980s revealed a downward tendency, even when both kinds of studies went back to the early 20th century. Deaton and Miller⁷⁶ find this phenomenon less surprising than it sounds. Real commodity prices seem to undergo long cycles around a trend, each lasting twenty years or more.⁷⁷ Consequently, estimates of the long-term trends are very sensitive to the precise time period studied.

What does this signify for a planner in a developing African country? One should avoid falling prey to either of the two reductionist arguments framed around the extremes of the Prebisch-Singer thesis. Good planning would require actions guided by caution around the structuralist theses of the 1950s, focusing on the decline in the terms of exchange between primary and manufactured products,⁷⁸ the volatility of primary product prices, or the limited linkages between the natural-resource sector and the rest of the economy.⁷⁹ It may be well that country-specific studies are required, as none of the structural explanations have been unequivocally confirmed by empirical tests⁸⁰ (e.g., Moran, Behrman, and Cuddington) to warrant African countries developing strategies to negate downward trends in commodity prices.

“The Long-Run Evolution of Energy Prices,” *The Energy Journal*, 20, 2 (1999); Carmen Reinhart and Peter Wickham, “Commodity Prices: Cyclical Weakness or Secular Decline?” IMF Staff Papers 41, June (1994); Joseph Balagtas, and Matthew Holt, “The Commodity Terms of Trade, Unit Roots and Nonlinear Alternatives: A Smooth Transition Approach,” *American Journal of Agricultural Economics*, Volume 91 Issue 1, pp. 87-105 (2009); David Harvey, Neil Kellard, Jakob Madsen, and Mark Wohar, “The Prebisch-Singer Hypothesis: Four Centuries of Evidence,” *Review of Economics and Statistics*, 92, No. 2, May, 367-377 (2010).

76 Angus Deaton, A, and Miller, R, 1995, International commodity prices, macroeconomic performance and politics in sub-Saharan Africa, *Princeton Studies in International Finance*, N. 79, October 1995.

77 Cuddington and Jerrett (n 75).

78 Prebisch (n 72).

79 Albert Hirschman, *The Strategy of Economic Development*, New Haven: Yale University Press (1958).

80 Cristián Moran, “Export fluctuations and economic growth”, *Journal of Development Economics*, Volume 12, Issues 1-2, February–April pp. 195-218 (1983); Behrman, J. (1987). Commodity price instability and economic goal attainment in developing countries. *World Development*, 15(5), 559-573, (1987); John Cuddington, “Long-Run Trends in 26 Primary Commodity Prices,” *Journal of Development Economics*, 39, 207-27 (1992).

3.7 Industrialization's Imminent Demise

The argument that natural resource booms hinder the industrial sector, either through real exchange rate appreciation or the absorption of production factors from lagging or non-tradable sectors,⁸¹ proposes that the expansion of the natural-resource sector is not sufficient to offset the negative effect of deindustrialization on economic growth. Additionally, there is a change in composition of exports in favour of raw materials, or even a drop in total exports, thus reducing economic growth.⁸² Notably, the Dutch disease explanation does not provide an explanation for the resource curse.⁸³ Auty⁸⁴ also dismisses this thesis by showing the complexity and diversity of cases in natural resource abundant countries, including several exceptions to the curse such as Norway, which has used its oil abundance to become a rich country.

The current call for African countries to increase value-addition and engender transformation through manufacturing⁸⁵ comes from a long tradition in economics before Prebisch-Singer to Nicholas Kaldor and Adam Smith. Outside of classical economics, diversification out of primary commodities into manufacturing is considered self-evidently desirable.⁸⁶ Yet, is industrialization the *sine qua non* of economic development? Classical economic theory posits that the current practice of relying on raw commodities is the right one for African economies. In the grand scheme of things, countries are best off producing whatever is to their comparative advantage, be it natural resources, manufacturing or agro-commodities putting less emphasis on beneficiation and value-addition.

Observably, authors such as Nicholas Kaldor⁸⁷ have argued that countries only become sustainably rich if they industrialize (oil-rich

81 J. Peter Neary and Sweder van Wijnbergen, 1986, "Natural Resources and the Macroeconomy: A Theoretical Framework," in Neary and van Wijnbergen, eds., *Natural Resources and the Macroeconomy* (MIT Press: Cambridge, 13-45) (1986).

82 Torres et al. (n 47) Thorvaldur Gylfason, "Natural resources, education, and economic development". *European Economic Review*, 45 (4-6), 847-859 (2001a).

83 E.g., Leite and Weidmann (n 38); Sala-i-Martin and Subramanian (n 60).

84 Auty (2001a, n 27)).

85 Justin Lin, "Structural Change in Africa," in Ernest Aryeetey, Shanta Devarajan, Ravi Kanbur, and Louis Kasekende eds. *The Oxford Companion to the Economics of Africa*, Oxford: Oxford University Press (2012).

86 Ha-Joon Chang, *Bad Samaritans: The Myth of Free Trade and the Secret History of Capitalism*. London: Random House (2008).

87 Nicholas Kaldor, "The poverty of equilibrium economics", *Economic Journal* (1972).

sheikdoms notwithstanding) and that this in turn requires a proactive industrial policy on the part of government. The manufacturing sector is assumed to be characterized by learning by doing, while the primary sector is not (see Matsuyama).⁸⁸ Deliberate policy-induced diversification⁸⁹ out of primary products into manufacturing is justified, and a permanent commodity boom that crowds out manufacturing can indeed be harmful.⁹⁰

Attempts by governments to force linkages between the mineral sector and processing industries do not always work, as the experience of countries like Zambia has shown. Other explanations for the resource curse include the disincentive for entrepreneurship,⁹¹ the decrease in savings and physical investment⁹² and lower investment in education and human capital,⁹³ all of which have long-term effects on an economy's growth prospects. Makochekanwa,⁹⁴ on the other hand, shows how Botswana managed to beat the Dutch disease effects of diamonds by taking deliberate policy actions including majority control of value-chain enhancement. In which case, the Botswana experience has a lot to offer African countries on how to avoid the resource curse and increase beneficiation.

88 Dani Rodrik, "Industrial development: stylized facts and policies", in David O'Connor and Mónica Kjällström (eds.), *Industrial Development for the 21st Century*, Zed Books (2008).

89 Hakim Ben Hammouda, Stephen Karingi, Angelica Njuguna and Mustapha Sadni Jallab, "Diversification: Towards a new paradigm for Africa's development", MPRA Paper No. 13359 (2006).

90 van Wijnbergen (n 36); Sachs and Warner (n 29).

91 Jeffrey Sachs and Andrew Warner, 2001, "The Curse of Natural Resources," *European Economic Review* (Elsevier), Vol. 45(4-6), pp. 827-838, May (2001).

92 Gylfason (n 82); Elissaios Papyrakis and Reyer Gerlagh, "Resource Abundance and Economic Growth in the U.S." *European Economic Review*, 51(4), 1011-1039 (2007); Elissaios Papyrakis. and Ohad Raveh, "An Empirical Analysis of a Regional Dutch Disease: The Case of Canada", OxCarre Research Paper 106 (2013)

93 Birdsall *et al*, 2001; Bravo-Ortega and Gregorio (2007), Thorvaldur Gylfason, "Nature, power and growth", *Scottish Journal of Political Economy*, 48 (5), 558-588 (2001b).

94 Albert Makochekanwa, "An econometric analysis of Botswana's sectoral export trade flows" Ph.D Thesis University of Pretoria (2010). <<http://upetd.up.ac.za/thesis/available/etd-05312011-141329/>>

3.8 Natural Resources as Factors of Production: The Augmented Uzawa-Lucas Model

The other perspective that needs to be considered is linked to the direct roles natural resources play as inputs or factors of production in the economy. There are a variety of economic models where a number of inputs such as labour and capital are factors of economic growth. A good example is the two-sector endogenous Uzawa-Lucas model of economic growth. However, in the real economy, the availability of accessible and demanded natural resources also plays an important and mixed role in economic development. This is particularly true for the countries where the economy depends highly on extractive industries. Uzawa⁹⁵ developed a model of economic growth with Harrod-neutral technological progress. The aggregate production function can be written as:

$$F [K(t); AU(t)LP (t)] \quad (1)$$

where $K(t)$ is the fixed capital stock, $AU(t)$ is the labour efficiency, and $LP (t)$ is the amount of labour employed in production sector. Uzawa assumed that labour efficiency depended on education, health, public goods, and so on. In this model, the influence of these factors is determined by the educational sector. He does not mention human capital directly in his article (though this conception is assumed intuitively). Lucas (1988) introduced a slightly different model where human capital is included explicitly.⁹⁶ Technological progress is mixed and not strictly Harrod-neutral as proposed in the Uzawa's model. The production function can be written as:

$$Y(t) = AK(t)\beta' [b_L(t)L(t)^{1-\beta} h_a(t)^\epsilon] \quad (2)$$

where A is a technological level which is assumed to be constant, $b_L(t)$ is the fraction of worker's non-leisure time devoted to production, $h(t)$ is the level of per worker's human capital and $h_a(t)^\epsilon$ is the external effect of human capital.

95 Hirofumi Uzawa, "Optimum technical change in an aggregative model of economic growth", *International Economic Review*, 6(1) (1965).

96 Robert Lucas, "On the mechanics of economic development", *Journal of Monetary Economics*, 22(1) (1988).

Neustroev⁹⁷ noted that a number of modifications to this model have been made over the years by including natural resources as factors of economic growth. For example, Cavalcanti *et al*⁹⁸ consider oil production, oil rent and oil reserves as proxies of natural resources which estimate the production function in each of the cases. Benchekroun and Withagen,⁹⁹ Farnstrand Damsgaard,¹⁰⁰ Gaitan and Roe,¹⁰¹ Groth and Schou¹⁰² develop models that explore the influence of natural resources on economic system development from macroeconomic perspectives. Bravo-Ortega and De Gregorio,¹⁰³ Valente,¹⁰⁴ and Neustroev¹⁰⁵ examine the influences of human capital and natural resources on economic development.

3.9 Migration and Population Movements

The discovery and subsequent extraction of natural resources has the tendency to result in population movements as communities adjust to

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- 97 Dmitry Neustroev, "The Uzawa-Lucas growth model with natural resources", Munich Personal RePEc Archive (MPRA) Paper No. 52937 (2013).
- 98 Tiago Cavalcanti, Kamiar Mohaddes and Medhi Raissi, "Growth, development and natural resources: New evidence using a heterogeneous panel analysis", *The Quarterly Review of Economics and Finance*, 51(4), (2011); Tiago Cavalcanti, Kamiar Mohaddes and Medhi Raissi, "Commodity Price Volatility and the Sources of Growth", *Journal of Applied Econometrics*, September (2014).
- 99 Hassan Benchekroun and Cess Withagen, "Global dynamics in a growth model with an exhaustible resource", Technical report, McGill University, Department of Economics Working Paper (2008).
- 100 Erika Farnstrand Damsgaard. "Exhaustible resources, technology choice and industrialization of developing countries". Technical Report, Research Institute of Industrial Economics, August (2010).
- 101 Beatriz Gaitan and Terry L. Roe, "Natural resource abundance and economic growth in a two country world. Technical report, DEGIT, Dynamics, Economic Growth, and International Trade, Jun 2005. DEGIT Conference Papers (2005).
- 102 Christian Groth and Poul Schou, "Can non-renewable resources alleviate the knife-edge character of endogenous growth?", *Oxford Economic Papers*, 54(3) (2002).
- 103 Claudio Bravo-Ortega and Jose De Gregorio, "The relative richness of the poor? Natural resources, human capital and economic growth", in: Lederman, D., Maloney, W. (Eds.), *Resources, Neither Curse Nor Destiny*. Stanford University Press, Washington, DC, Chapter 4, pp. 71-99 (2007).
- 104 Simone Valente, "Human capital, resource constraints and intergenerational fairness", CER-ETH – Center of Economic Research (CER-ETH) at ETH Zurich Economics working paper series (2007).
- 105 Neustroev (n 97).

changes in their livelihood systems. Corden¹⁰⁶ analyses how labour movements occur from non-tradable and lagging sectors to where there is a boom. These movements are more prominent in the context of regions where there are no jurisdictional restrictions on migration, such as visas and work-permit requirements. Maddock and McLean¹⁰⁷ provide historical evidence on how the Australian gold rush of the mid-19th century resulted in massive (im)migration.

How do the adjustments occur? Because of increased demand, the returns to factors inputs in the booming sector rise, attracting relatively mobile factors to flow into it, thus forcing up the prices that the other industries have to pay for their similar inputs. Because the price of the tradable sector is assumed fixed on the world market it suffers a price-cost squeeze and contracts.¹⁰⁸ This is the notion of deindustrialization highlighted earlier. Meanwhile, prices in the non-tradable sector rise, allowing the sector to compete for factors. The sectoral adjustment due to the flows of factors into the booming sector is what Corden and Neary¹⁰⁹ called the resource movement effect. Moreover, the boom increases incomes and hence the overall demand for goods and services. However, the lagging yet tradable sector gets some limited gains from the boom, because the increased demands for its products represent only a small increase in world demand, by the definition of a small economy.¹¹⁰ A spending effect also arises with the potential to increase the demand for non-tradables considerably. Essentially, a boom would squeeze the lagging sector, yet its effect on non-tradables would be ambiguous, tending to increase demand through the spending effect and to increase costs through the resource movement effect. What starts off as people adjusting to new livelihood arrangements has unpredictable macroeconomic consequences depending on the source of the boom and the expectation about it.¹¹¹

106 Max Corden, "Booming Sector and Dutch Disease Economics: Survey and Consolidation," *Oxford Economic Papers* (Oxford University Press), 359-380 (1984).

107 Rodney Maddock and Ian McLean, "Supply-Side Shocks: The Case of Australian Gold", *The Journal of Economic History*, Vol. 44(4) (1984).

108 Maddock and McLean (n 107).

109 Max Corden and J. Peter Neary, "Booming sector and de-industrialisation in a small open economy", *The Economic Journal*, 92 (368): 825-848 (1982).

110 Maddock and McLean (n 107).

111 Corden (n 106).

3.10 Unsustainability of Long-Term Growth by Means of Commodities

How should society react to the depletion of a natural resource? This question is of universal concern given the effects of climate change and the need to manage environmental assets sustainably. The possibility of depletion is one motivation for diversifying the economy beyond natural resources into other sectors.¹¹² Depletion is also a reason to make significant saving of the rents from exhaustible natural resources.¹¹³

A number of initiatives, such as the EITI and the African Mining Vision, have been undertaken to tackle excesses that undermine beneficiation as well as conservation and sustainable usage. Sometimes excessive depletion shows failure in governance;¹¹⁴ the political elite extract at an excessive rate because they over-discount the future,¹¹⁵ and are more intent on surviving the next election or coup attempt. In this regard, privatization and other private sector involvements provide a possible solution. Unfortunately, it is often impossible, either physically or politically, to guarantee property rights. The difficulty in enforcing property rights over non-renewable resources has been one of the many reasons undermining private sector engagement in schemes such as public private partnerships (PPPs).¹¹⁶

Given its desire to extract rents, government's ownership of mineral wealth may undermine the motivation to establish a broad-based regime of property rights for the rest of the economy. In addition, rights over some natural resources or commons, cannot be established. Imposing property rights to control depletion is particularly difficult when the resource is dispersed over a wide area, as with timberland and other biodiversity assets. Unenforceability means that the resource will be

112 Frankel (n 67); Ben Hammouda et al. (n 89).

113 John Hartwick, "Intergenerational Equity and the Investing of Rents from Exhaustible Resources," *American Economic Review*, Vol. 67, No. 5, Dec., pp. 972-974 (1977); Robert Solow, "On the Intergenerational Allocation of Natural Resources," *The Scandinavian Journal of Economics*, Vol. 88, No. 1, pp. 141-149 (1986).

114 Frankel (n 67).

115 Robinson, Torvik and Verdier (n 50).

116 Peter Farlam, "Working together: assessing public-private partnerships in Africa", SAIIA NEPAD Policy Focus Series Report 2 (2005) <<http://saiia.org.za/images/upload/PPP-NepadReport-Final9Feb05.pdf>>

rapidly depleted.¹¹⁷ By extension, a society or country might be better off if it is prevented from selling off the resource.¹¹⁸ Frankel¹¹⁹ defines common pool resources as those that are at the same time (i) subtractable (as are private goods); and (ii) too costly to prevent users from consuming (as are public goods); while yet (iii) not impossible to exclude users from.¹²⁰ Enforcement of property rights is all the more difficult in a frontier situation¹²¹ or in a rush, such as the uncontrolled logging in the Congo's equatorial forests.

Where the extraction of a valuable resource such as oil or diamonds is not regulated, hostilities (such as the wars in the DRC, Angola, Sierra Leone and Liberia) break out. Some studies have shown that economic dependence on oil and mineral wealth is correlated with civil war.¹²² Indeed, countries such as the DRC and many others in sub-Saharan

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- 117 Partha Dasgupta and Geoffrey Heal, *Economic Theory and Exhaustible Resources* (Cambridge University Press: Cambridge UK) (1985).
- 118 James A. Brander and M. Scott Taylor, "International trade and open-access renewable resources: the small open economy case," *Canadian Journal of Economics*, 30, 526-552 (1997).
- 119 Frankel (n 67).
- 120 Elinor Ostrom and Vincent Ostrom, "Public Goods and Public Choices," in *Alternatives for Delivering Public Services: Toward Improved Performance*, Emanuel Savas, ed. (Westview Press: Boulder), 7-49 (1977).
- 121 Edward Barbier, 2005, "Frontier Expansion and Economic Development," *Contemporary Economic Policy* 23, No. 2, April, 286-303 (2005a). Edward Barbier, *Natural Resources and Economic Development* (Cambridge University Press: Cambridge UK) (2005b). Edward Barbier, "Frontiers and Sustainable Economic Development," *Environmental and Resource Economics*, 37: 271-295 (2007); Ronald Findlay and Mats Lundahl, "Natural Resources "Vent for Surplus and the Staple Theory," *From Classical Economics to Development Economics: Essays in Honor of Hla Myint*, edited by Gerald Meier (St. Martin's Press: New York) (1994); Ronald Findlay and Mats Lundahl, "Natural Resources and Economic Development: The 1870-1914 Experience," in *Resource Abundance and Economic Development*, Richard Auty, ed. (World Institute for Development Economics Research) (2001).
- 122 Indra De Soysa. 2000. "The Resource Curse: Are Civil Wars Driven by Rapacity or Paucity?" International Research Center, Canada, No. 9 (2000); James Fearon and David Laitin, "Ethnicity, Insurgency and Civil War," *American Political Science Review*, 97, No. 2, 75-90 (2003); Paul Collier and Anke Hoeffler, "Greed and Grievance in Civil War," *Oxford Economic Papers*, Vol. 56 (4), pp. 563-595 (2004); Macartan Humphreys, "Natural Resources, Conflicts, and Conflict Resolution: Uncovering the Mechanisms," *Journal of Conflict Resolution*, 49, 508-37 (2005); Paul Collier, *The Bottom Billion: Why the Poorest Countries Are Falling Behind and What Can Be Done About It* (Oxford University Press: Oxford) (2007).

Africa have been targeted by criminal gangs engaged in mineral smuggling, trading in small arms and other criminal activities.¹²³ This loop is completed by a global political economy that is also in flux and whereby international finance actively supports these criminal trends.¹²⁴

4. MANAGING AFRICA'S NATURAL RESOURCES FOR LONG TRANSFORMATION

There are a number of policy and programmatic actions African countries can take to manage their natural resources and environmental assets to avoid the wrath of volatility, depletion and ensure sustainable development. Some of the actions considered are:

4.1 Managing Commodity Funds Professionally

The windfalls of a commodity boom must be used to establish transparent sovereign wealth funds to ensure that future generations share the proceeds, while investing in assets that earn a higher rate of return to smoothen intergenerational income streams. Botswana's Pula Fund, built on earnings from the sale of diamonds, is one continental practice worth emulating. The fund is made up of securities denominated in other currencies, and acts as a sinking fund to offset the depletion of diamonds and a buffer to smooth global fluctuations. The daily management of the Pula Fund is under the care of independent asset management professionals without much political interference from the government. Careful and strategic utilization of the fund is critical as this can be depleted as the case of Ghana shows.

4.2 Distributing Commodity Revenues Per Capita Equitably

Another approach is to invest in a fund, which permits the distribution of investment earnings on an equal per capita basis, an example being the Alaska Permanent Fund. Sharing windfalls on this basis enhances beneficiation, and citizens feel that they are full stakeholders in the

123 Timothy Shaw, "From post-BRICS' decade to post-2015: insights from global governance and comparative regionalisms", *Palgrave Communications*, Vol. 1 (2015).

124 Steven Platt, *Criminal Capital: How the Finance Industry Facilitates Crime*. Basingstoke: Palgrave Macmillan (2015).

Fund. Africa has made some initial progress to ensure greater accountability and transparency over natural resource fund flows. As of end January 2015, 18 African countries were fully EITI-complaint.

4.3 Diversifying the Economy as a Long-term Development Strategy

Africa suffers from trade shocks and global commodity volatility due to the domination of traditional integration arrangements in its external trade. There have been heated debates about the effects of global volatility, and many studies have sought to confirm the tendency of structural decline in real prices of primary commodities over time.¹²⁵

The second issue concerns the commodity concentration of traded goods, where Africa is caught in a revenue trap with agricultural and mining products representing about 70 per cent of total exports. Manufactured exports are concentrated in a small number of countries (in North Africa, South Africa, and Mauritius). More than 70 per cent of the total imports constitute manufactured goods.

Third, despite the aggressive entry of countries such as China and India, Western Europe is still Africa's major trading partner with the 51 per cent of total trade noted earlier in Section 2. Post-independence import-substitution strategies failed to enhance the structural transformation of African economies, and exacerbated the colonial legacy of enclave configurations with limited diversification.

The importance of diversification as a mechanism to hedge against global volatility and trade shocks is not new. As far back as the 1930s, MacLaughlin¹²⁶ explained economic cycles in American cities by the degree of concentration of economic activities. He demonstrated that cities with a higher level of concentration suffered the most from the crisis of the inter-war period. The debate later extended to studying the implications of the fall in prices of raw materials like coffee for Latin American countries. These conversations later gave birth to structuralist appreciation of underdevelopment as expounded by the Economic Commission for Latin America and the Caribbean (ECLAC). From the 1940s to the 1970s, commentators and researchers

125 Deaton and Miller (n 76).

126 Glenn E. McLaughlin, "Industrial diversification in American cities", *Quarterly Journal of Economics*, 44:131-149, (1930).

developed several themes in exploring this new paradigm. For example, Rosenstein-Rodan¹²⁷ and Leontief¹²⁸ emphasized the concept of the effects of cumulative drive and the density of inter-sectoral matrices.

There has been a renewal of the debate on diversification and its role in growth dynamics.¹²⁹ The resurgent literature explains the fragility of African economies and the continent's marginalization in the global economy by the lack of diversification of African economic structures. A number of authors use Romer-type models to highlight the beneficial effect of diversification expressed through the availability of inputs within an economy, and potentially contributing to increasing labour productivity and human capital. Diversification may also contribute to growth by increasing the number of sectors and, accordingly, investment opportunities, and reducing investors' risks especially in a volatile global economy.

4.4 Using Regional Approaches for Regional Integration

Regional integration is an important strategy for hedging against global volatility as it can transform the way African countries trade and participate in the world economy. First, countries adopt Spatial Development Initiatives (SDIs) or Spatial Development Programmes (SDPs), which have transport corridors as their main component. Spatial initiatives promote growth by increasing the diversification of the various national economies in which they are located. They stimulate cross-border economic activity and shield local businesses from global shocks. A number of countries such as Tanzania and DRC have overlapping memberships in regional associations, thus increasing their access to multiple regional economic spheres which can serve as markets for their products with intra-regional trade in SADC rising between 2000 (15 per cent) and by end of 2014 (18 per cent) by a good three percentage points. The obverse is that multiple memberships tend to introduce gridlock into the decision making process for closer integration, as countries try to optimize their objective functions.

127 Paul Rosenstein-Rodan, "Problems of Industrialization of Eastern and South-Eastern Europe", *Economic Journal*, Vol. 53, No. 210/211 (1943).

128 Wassily Leontief, *Studies in the Structure of the American Economy*, New York: Oxford University Press (1953).

129 Ben Hammouda et al. (n 89).

Second, enhancing regional integration involves harmonizing various technological standards and regulations, and reforming customs and border controls. These measures are critical for strengthening the business climate in Africa in the face of an inherently volatile global environment. Regional integration is especially important as a platform for pooling resources for things such as R&D and trade negotiations, given the small size of most African states and their economies. Regional Economic Communities (RECs) can provide a foundation for effective global competition by creating common markets, pooling resources, and providing a framework to coordinate the regional management of infrastructure. RECs are critical in building and strengthening capacities related to regional human resources, health, security and the environment for sustainable transformation. The Nile Basin Initiative is a good example of a regional approach to managing water resources.

Finally, a regional approach to risk management, as shown in the work of the Africa Trade Insurance Agency and Afriexim Bank, is critical. Small-scale farmers who have limited financial resources and cannot manage price risk produce most agricultural commodities in Africa. This contrasts with developed countries like the US, where 90 percent of farmers sell their products through the Chicago Board of Trade. The market-size-problem can be resolved by regional integration. The existence of a thriving spot market is necessary for the success of a derivatives exchange, but outside of Nigeria, South Africa, Ethiopia and a few North African countries, commodity markets in Africa are small and highly informal¹³⁰ turning them into impediments to the development of liquid spot markets and consequently derivatives markets.

4.5 Building Necessary Capacity

Countries need to invest in the necessary capacities or technical capabilities (by training fund managers for example) necessary for managing risks in a volatile global environment. Given the complex nature of commodity risk management and related instruments, countries and traders need a certain level of financial literacy in order to select risk management instruments and design a strategy appropriately. Capacity building is needed to help African producers

130 UN Conference on Trade and Development (UNCTAD), Progress in the development of African commodity exchanges, 2nd extraordinary session of the conference of ministers of trade 21-24 November, 2005 Arusha, United Republic of Tanzania (2005).

and buyers understand the full range of instruments available to manage commodity price risk. Capacity building also has to cover financial institutions and intermediaries, as well as supervisory authorities that will oversee risk management activities.

4.6 Developing Appropriate Market Structures

African commodity markets often lack both physical and soft infrastructure. Soft infrastructure includes transaction facilitators, information analysers, credibility enhancers, and regulators. In the absence of market research, commodity producers and buyers face difficulties in setting up prices (both spot and future), defining quantities of goods and identifying which markets offers the best options for trading. Traded commodities on African markets often have tracing difficulties and are thus not “graded”. This restricts African producers’ access to international markets. Physical infrastructure is key to the success of a commodity exchange, particularly warehouses, and transportation and distribution networks are essential.

4.7 Instituting the Right Regulatory Barriers

African countries need to develop the right regulatory frameworks for preserving macroeconomic and social stability as well as sustainable use of natural resources, including soil and forest covers. Foreign exchange control may make it difficult for domestic buyers and sellers to hedge on international markets. Since the 1990s many African countries have liberalized their capital account yet do not authorize foreign investments for hedging purposes. In order to overcome such restrictions, importers in countries like Tunisia hedge their price risk through their commodity suppliers. While such practice reduces their exposure to price risk, it prevents them from adjusting their hedging positions to price movements, or to use options in anticipation of a shock episode. International providers of risk mitigation instruments such as the ATIA and Afrexim Bank are facing increasing pressure to fulfil the Know-Your-Client requirements. This has led to an increasing reluctance by many financing agencies to deal with African clients, because of providers’ risk aversion.¹³¹

131 African Airlines Association (AFRAA), Strategy for the development of the air transport industry in Africa (2006). <<http://christianfollykossi.com/docs/FundingRequirementsSummary-TunisMay06.pdf>>

4.8 Strengthening Financial Sector Development

Commodity derivatives can significantly reduce the losses from adverse movements in world commodity prices through market-based instruments. There are two types of derivative securities: futures/forward and call/put options. Futures and forwards options lead to predefined payments while call and put derivatives give the holder flexibility to buy or sell, thus translating into flexible flows that depend on market movements. Producers and buyers can hedge by directly being active on derivatives exchanges, through intermediaries like trading houses or brokers, or through over-the-counter (OTC) markets to hedge their price risk.

African markets offering commodity derivatives, with the exception of the South Africa-based SAFEX, have failed to attract significant trading volumes, and remain as providers of price information and standardized regulation. The number of contracts traded on the JSE since 2010 increased year on year by 12 percent to stand at 2.1 million.¹³² Additional markets offering commodity derivatives are available in Kenya (African Mercantile Exchange), and Mauritius (the Global Board of Trade Ltd (GBOT)). Bourse Africa in Botswana has opened with a vision to help buyers and sellers of African commodities achieve better price discovery thus smoothing the effects of price volatility. Essentially, there is a need for greater financial sector development for instruments such as derivatives to be useful hedging tools for African economies in the face of global volatility of their commodity prices.

5. CONCLUSION

We have noted that both natural resources and global volatility will continue to influence the debates around Africa's development agenda for decades to come. The existence of natural resources, either renewable or non-renewable, can confer both negative and positive effects on a country depending on its NRM and governance frameworks. We considered in Section 3 a number of channels whereby natural resources have been hypothesized to affect economic performance and outlined some specific actions that need to be taken to harness the effects of

132 African Development Bank Group, 2012 African Development Report 2012, Towards Green Growth in Africa, Tunis, 2012.

global commodity volatility on Africa's long-term growth prospects. Notably, the Prebisch-Singer hypothesis of a negative long-term trend in commodity prices needs to be treated with caution because of empirical findings that there is no consistent trend either way.

We outlined in Section 4 a wide range of strategies to deal with volatility issues and ensure that natural resources are put to good use with the full knowledge that specialization in these resources can be detrimental to growth. This is more so if the natural resources sector crowds out the manufacturing sector where the latter is the locus of positive externalities. In some instances, natural resource endowments lead to institutional decay, characterized by corruption, inequality, absence of rule of law and human insecurity. Pockets of insecurity and armed conflict linked to resources have constantly affected countries that are endowed with natural resources such as the DRC and Nigeria. The absence of property rights can also exacerbate the push to deplete natural resource endowments too rapidly, leaving the country bereft of assets, and environmentally damaged. Natural resources need not necessarily be a curse, as Botswana has shown. In effect, a commonsense or good-fit approach would ensure that policies and institutions are tailored to local circumstances, country by country.