

Research Paper

Paul Stevens, Glada Lahn and Jaakko Kooroshy
Energy, Environment and Resources | August 2015

The Resource Curse Revisited



**CHATHAM
HOUSE**
The Royal Institute of
International Affairs

Contents

Summary	2
Introduction	5
The Curse of Natural Resources	8
Prescriptions Issuing from the Extractives-led Growth Agenda	18
New Producers Face a Changing Global Context	24
Turning the Resource-curse Question Upside Down	28
What Should Countries with Newly Discovered Resources Consider?	35
Conclusions and Questions for Further Investigation	41
Acknowledgments	45
About the Authors	45
References	46

Summary

During a decade-long commodities boom, countries with newly discovered or expanding hydrocarbon and/or mineral resources have attracted tens of billions of US dollars in foreign investment. Mongolia, Myanmar, Zambia and Ghana have all registered some of the fastest rates of economic growth in the world. Amid those developments, an international consensus has emerged that extractives-led growth is a viable path to broader socio-economic development in poor countries. Whereas only 10 years ago the prevailing wisdom was that resource endowments were not a blessing but a curse – one that constrained growth, fed corruption and fuelled conflict – now international financial institutions, consultancies and donor agencies believe that the curse can be avoided by ‘good governance’ of the extractive sector and the revenues it generates.

That view stems in part from the desire to establish a ‘win-win’ situation for development, corporate and diplomatic interests. In short, this entails harnessing the commodities boom to alleviate poverty, increasing market supplies and investment opportunities, and bringing countries into the multilateral governance fold in an era in which growing Asian resource investment is challenging conventional business models and donor influence in developing countries.

But the international context is changing rapidly. The global commodities boom that underpinned the performance of resource-rich economies has ended. Meanwhile, mounting efforts to tackle climate change will affect the markets for many extractive resources in the future. Against the background of a fast-changing international environment, this research paper revisits the resource-curse theme. It argues that while natural resources may provide low-income countries with a significant development opportunity, serious risks are attached to a policy of growth based on their extraction, monetization and domestic consumption. The extractives-led growth consensus appears largely blind to those risks.

The resource curse has not been lifted

The theory of a ‘curse of natural resources’ can be traced back to the 1970s. The subsequent two decades saw the emergence of a significant body of research proposing a link between resource production, economic underperformance and various socio-political ills.

However, since the turn of the century, the nature of the alleged curse and its causality have come under question. Critics of the resource-curse theory point to countries that have avoided the curse – such as Botswana, Chile and Malaysia – and challenge the methodology, particularly the use of a small sample of countries or short timeframe.

The shortcomings of the resource-curse theory arise mainly from the reductionist quest for ‘one big explanation’ of the role of resources in development. The generalization that resource production harms the economy overlooks the complexity of economic development in different countries under different circumstances. Inevitably, the experience of extractives-led growth varies from country to country.

Rather than focusing on why resource production harms the economy, this paper asks a more pertinent question: why has resource production failed to create more resilient economies?

Such economies achieve growth while diversifying away from the extractive sector, thereby reducing their vulnerability to falls in resource prices and the eventual depletion of reserves.

The key point here is that revenue from extractives is not income. It is simply the reshuffling of a country's portfolio of assets: exchanging resources below ground for cash above ground. Overall success is determined by the extent to which a country can capitalize on such reshuffling – namely, by investing the cash productively and by forging linkages between the extractive sector and the rest of the economy.

On the basis of such premises, this paper argues that while it is not inevitable, the resource curse is alive and active. Numerous resource-exporting countries have failed to diversify their economies away from the extractive sector even if they have developed other economic sectors; they remain dependent on extractive revenues. Such failure is most pronounced among some of the Gulf countries, which, though certainly more prosperous than they would have been without oil and gas, remain highly vulnerable to price shocks. During periods of shrinking revenues, less well-endowed countries find themselves increasingly dependent on oil-backed debt.

The context for new producers looks more challenging than ever

The recent slump in commodity prices is a salutary reminder of what the resource curse is all about – namely, the creation of an economy overly dependent on revenue from a volatile and finite source. Moreover, the outlook for those prices remains uncertain; and as demand growth slows in China, OPEC pursues a strategy of targeting market share rather than price, and shale oil production costs continue to decline in North America, the prospect of a quick recovery is dim.

Global momentum to tackle climate change by reducing emissions from fossil fuels poses a new challenge to the extractives-led growth model. Depending on the strength of climate-change policies, peak demand for fuel is a near-term possibility, albeit with different timeframes for coal, oil and gas. If ambitions to mitigate climate change are realized, significant volumes of those fuels will be left 'unburned'. Given that the period from resource discovery to full production is typically 10–20 years, governments in emerging and prospective exporting countries have an interest in understanding what this means for their future markets.

The implications of climate-change policies for gas, metals and minerals are more complex than those for coal and oil; and they vary among resources and among potential markets. However, in the longer term, aspirations to decouple resource use from economic growth and the transition towards a 'circular economy' could have a similar potential impact to that of climate-change policies.

The extractives-led growth model is inadequate

The standard policy advice for extractives-led growth focuses on governance imperatives such as transparency and sovereign wealth funds. But this ignores the fact that such growth frequently encourages poor governance. Without strong institutions, it leads to the enrichment of minority elite groups; and as the sector develops, the interest of those groups in capturing rents and maintaining their hold on power acts as a barrier to improving governance.

Avoiding the resource curse is a question not only of good governance but also of an economic policy that provides for the transition of an economy over time in accordance with its competitive advantages. The challenge of such a policy in the context of low institutional capacity and/or limited economic development is huge. There is often a mismatch between the policies prescribed and the capacity of governments to implement them, as a result of which symptoms of the resource curse are manifest in many countries. Furthermore, vested interests benefiting from an extractives-centred policy may directly oppose reforms that would promote economic diversification.

Both governments with extractives potential and the agencies advising them give too little consideration to the size and nature of the resource base. If extractives-led growth is to be sustained, resource extraction must persist long enough for new economic sectors to emerge and generate revenues that can support government spending and import needs as income from extractives declines. On the basis of current estimates of the size of reserves, new producers identified in this research paper lack sufficient reserves for extractives-led growth to be a viable economic strategy.

Moreover, the extractives-led growth model, in the form in which it is currently being promoted, is at odds with low-carbon and green growth strategies. It offers no suggestions on how governments should manage the risk of stranded assets or how they can reconcile extractives-led growth with national sustainable-development objectives.

Advice for governments planning resource development needs a fundamental rethink

Simultaneously managing the risks of the resource curse and stranded assets while taking advantage of green-growth opportunities imposes even greater demands on the institutional and economic capacities of low-income countries. Indeed, it requires making difficult choices and taking precautionary measures. For example, while the risk of stranded assets can be reduced by prioritizing resources for domestic use rather than export, careful planning is needed to ensure investment is not inhibited altogether or unsustainable patterns of fuel consumption locked in. Alternatively, governments can pursue the fast-track extraction and export of resources to avoid their becoming stranded, but the resulting glut of revenues and the rapid development of the resource sector increase the risk of the resource curse.

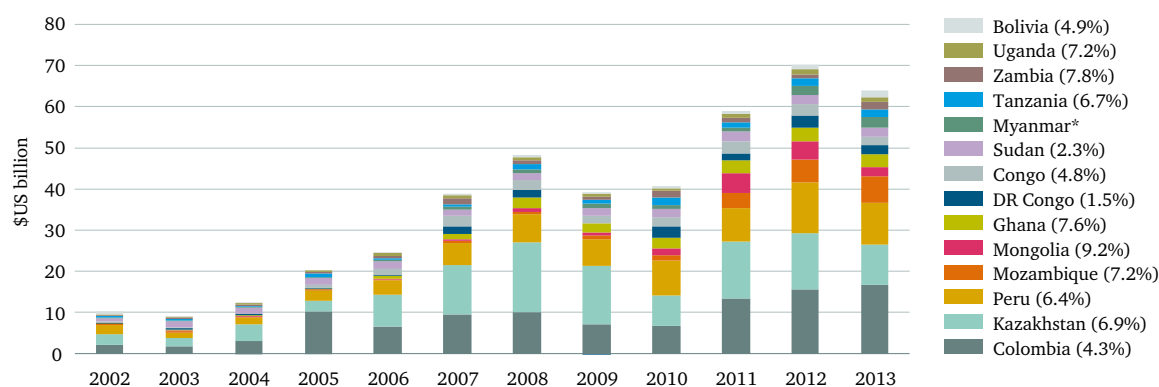
An obvious way of managing the risk of the resource curse is to pursue the development of the extractive sector at a slower pace, allowing time for institutional capacity and economic linkages to be built. Such an approach would make it easier for governments to avoid the curse and steer economic diversification in a manner consistent with green-growth objectives.

As governments of countries as diverse as Afghanistan, Mauritania, Somalia, Liberia and Cuba prepare to follow an extractives-led growth path, it is clear that both the advice being handed down to them and the growth model itself require a fundamental rethink.

Introduction

In response to a decade-long commodity boom, resource-seeking foreign direct investment (FDI) worth tens of billions of US dollars has flowed into so-called frontier economies. Since 2005, Western multinationals and mining companies from emerging economies invested in a new generation of extractive mega-projects in low-income countries such as Mongolia, Mozambique, Myanmar and the republic of Congo, turning those states into some of the fastest growing economies in the world (see Figure 1).

Figure 1: FDI net inflows (current US\$ billion) and GDP growth (%) for 14 resource-driven economies



Sources: UNCTAD and the IMF, cited in the World Bank's *World Development Indicators 2014*.
* GDP growth percentage unavailable.

This has led to renewed hopes that developing the extractive industries could be just the ticket for sustained economic growth in many poor countries. Governments and local populations in these emerging producer countries are eagerly hoping to trade a past of poverty and political instability for a future of sustained jobs, infrastructure development and prosperity. Others, such as Sierra Leone, Mauritania and Afghanistan, would dearly like to follow their example.

Meanwhile, the idea is being promoted by a diverse set of actors – including donors like the World Bank, the UN Development Programme (UNDP) and the Department for International Development (DFID), consultancies such as McKinsey and civil-society organizations like the Natural Resource Governance Institute (NRGI) and the Africa Progress Panel – that, if managed properly, extractive industries can help drive broad-based socio-economic development for resource-rich developing countries. In his foreword to the 2013 annual report of the Africa Progress Panel, former UN secretary-general Kofi Annan summarized this thinking, arguing that:

[There is] good reason to be optimistic ... economic governance continues to improve, providing protection against the boom-bust cycle fuelled by earlier commodity booms ... Defying the predictions of those who believe that Africa is gripped by a 'resource curse', many resource-rich countries have sustained high growth (Africa Progress Panel, 2013, p. 6).

In a similar vein, the consultancy McKinsey argues in a 2013 report that while many resource-rich economies have failed to live up to their potential, better management of the extractive industries could become a source of transformative development:

If resource-driven countries, particularly those with low average incomes, use their resources sectors as a platform for broader economic development, this could transform their prospects. We estimate that they could lift almost half the world's poor out of poverty (Dobbs et al., 2013, p. 1).

This optimistic stance on the use of oil, gas and mineral resources as a basis for economic improvement stands in marked contrast to the policy orthodoxies of just 10 years ago. Since the mid-1980s, the discussion on resource-driven economies was dominated by the concept of the 'resource curse'. The prevailing policy narrative at the time was that excessive reliance on the primary sector would impede long-term development, and that countries should seek to diversify their economies away from the extractive sector.

Of course, today's focus on helping countries to make the most of their extractive sectors does not entirely ignore the policies of the past, but now the dominant narrative is that lessons have been learned and that countries can avoid the pitfalls by 'following the rules of best practice'.¹ The economic policies required to benefit from resource-driven growth have been well known for several decades. However, as this research paper explains, the problem is how to implement those policies in the specific context of each developing country. Put another way, the problem has less to do with the policy advice on offer than with the common failure of producers to follow that advice and implement the proposed policies effectively.

As is argued below, both the countries benefiting from recent high growth and several of those wanting to follow in their footsteps remain vulnerable to the possible side effects of extractives-led development. The future markets for their resources are characterized by uncertainties – not least regarding the impact that price volatility and climate- and pollution-related policies in key consuming countries will have on demand for and income from their products. Other important factors are the influence of new technologies, pressure from changing domestic demographics and environmental stress.

The problem has less to do with the policy advice on offer than with the common failure of producers to follow that advice and implement the proposed policies effectively.

It is important to make the right decisions about what role, if any, new extractive discoveries should play in a country's development and the governance of revenues from them. For producer country governments, failure to make the right decisions means that the chance to reduce poverty and improve living standards is squandered. For the operating companies, such a failure threatens their investments and assets, and risks damaging their corporate reputation. Finally, making the right decisions matters for global markets since during an economic crisis they are crucial to avoid creating global supply issues and increasing commodity price volatility (Stevens et al., 2013).

This paper critically examines the current policy fashion of encouraging countries to use below-ground resources for development – what is referred to below as the 'extractives-led growth agenda'. To help put this trend in perspective, it looks at the historical evolution of academic studies on the effects of large-scale extraction and export of resources on the economy, society and politics as well

¹ See, for example, 'The twilight of the resource curse?' *The Economist*, 10 January 2015.

as at the experience of those effects. Drawing on its findings, it goes on to ask if the apparent success of the producer emerging countries is a transient phenomenon. Or is the current emphasis on better governance working as an antidote to the effects of the resource curse? What do changes in the global context – including the downturn in commodity prices (those of oil and some minerals, in particular) and the strengthening of climate-change mitigation legislation – mean for ‘new producers’? And is the current policy advice robust in the face of those changes?

The paper starts by summarizing the central tenets and key criticisms of the resource-curse theories, based on an extensive review of more than three decades of literature. It then contrasts the policy advice flowing from the extractives-led growth agenda with the implications of the resource-curse literature and examines the experience of various countries in following some of that advice. The following section looks at the new context faced by producers and how it that may affect success in developing the sector.

The traditional resource-curse question is then turned upside down. Instead of asking if the effect of resource development on the economy is inevitably negative, the paper asks what constitutes success. Thus the focus is on economic diversification, the potential for linkages between the sector and the rest of the economy, and the challenges of making that diversification sustainable.

The paper finds that several development options and perspectives have tended to be sidelined or obscured by the extractives-led growth agenda. On the basis of those findings, it concludes by setting out the options for countries that have newly discovered resources and for the donor community helping them develop those resources.

An appendix to this paper is published separately on the Chatham House website under the title ‘Resource Curse Revisited: A Literature Review’ (<http://www.chathamhouse.org/publication/resource-curse-revisited>). It discusses in detail the large body of literature on which the arguments and evidence cited here are based. It includes an extensive bibliography, which to a large extent is an update of Stevens (2003a).

The Curse of Natural Resources

The idea that large resource endowments are ‘bad’ for the countries that exploit them is long-established. Most likely, it stems mainly from what amounts to a strong puritan streak in human beings. For some reason or other, too much of a good thing is considered not to be good. A number of quotes from the literature listed in the appendix to this research paper illustrate this attitude – the most colourful probably being that from the sixteenth-century philosopher and political theorist Jean Bodin (cited in Sachs and Warner, 1997, p. 14):

Men of a fat and fertile soil are most commonly effeminate and cowards whereas ... a barren country makes men ... careful, vigilant and industrious.

The long-standing idea of plenty being a bad thing was revived by the first oil price shock of 1973–74, when international prices of crude oil quadrupled within three months, with huge implications for the oil revenues of the OPEC member countries. Numerous studies have argued that there is a negative correlation between an abundance of natural resources and GDP performance. The conventional approach to explaining the ‘resource curse’ has a number of elements that emerged following the first oil price shock. The following discussion focuses on some of the main – often mutually reinforcing – arguments.

Alleged symptoms of the curse

Lower economic growth

The ‘windfall’ nature of revenues and the idea that a new ‘booming’ sector renders other sectors uncompetitive in the world market are central to the majority of resource-curse theories.

The term ‘Dutch disease’ has been in use since 1977, when it was first applied to the phenomenon of a decline in the manufacturing sector of the Netherlands linked to appreciation of the Dutch currency after the country had begun exporting gas in the late 1960s. Inflation (resulting from spending the gas export revenues) combined with an appreciation of the nominal exchange rate (if the domestic currency is seen as a ‘petro-currency’) leads to an appreciation of the real exchange rate. The result is a contraction in the non-oil, -gas or -mineral traded sector as exports become more expensive and imports cheaper.

Corden and Neary (1982) analyse the negative impact of domestic inflation on profit margins and foreign investment in other export sectors. Sachs and Warner (1997), for their part, demonstrate empirical evidence of a negative correlation between macroeconomic volatility and growth. Given oil price volatility, it is not unreasonable to make the connection between oil revenues and poor growth performance.

As for evidence of that connection, Sachs and Warner (1997) show by means of a sample of 95 developing countries that there was a negative correlation between natural resource-based exports (agriculture, minerals and fuels) and growth during the period 1970–90. Similarly, Auty (2001) finds that between 1960 and 1990, the per capita incomes of resource-poor countries grew two to three times faster than those of resource-abundant countries. Van der Ploeg (2011) pointed out that OPEC as a whole saw a decline in GNP per capita while countries with comparable GNP per capita enjoyed growth.

Increased inequality of wealth

Another strand of the literature tries to demonstrate that the resource curse is evident in those countries that have a poor record of poverty alleviation. Much emphasis is put on the observation that resource abundance tends to increase income inequality, which is usually explained as a systemic problem resulting from the way in which extractive resource wealth flows into an economy. In most legal jurisdictions, extractives are the property of the state and the initial revenues from them accrue to the government or a government-industry elite. The sector is capital-intensive (and therefore often dependent on foreign investment in the early phases), requires a small amount of labour relative to its contribution to the economy and, in many cases, has few linkages with the rest of the economy.² Such characteristics encourage an ‘allocative’ approach to wealth distribution, for which governments are often ill-equipped. As a result, wealth is not distributed evenly or fairly.

This is a salient argument that has spawned various concepts in studies on the political economy of oil-exporting countries and their socio-political structures. One such concept is that of the ‘rentier state’ (Beblawi and Luciani, 1987).

Entrenchment of undemocratic regimes

Linked to arguments about the centralization of wealth is the charge that natural-resource abundance retards political change and entrenches regimes. The members of the government-industry group are collectively termed ‘rentier elites’, who ‘capture’ natural-resource rents and use them to create patronage networks that consolidate their power. It is argued that these elites have strong vested interests in maintaining the status quo and thus act to suppress criticism and potential political challengers (Beblawi and Luciani, 1987).

Other studies make the distinction between the ‘developmental’ and ‘predatory’ state: both may be authoritarian, but the former has a bureaucratic structure and an elite that will develop the country while the latter has an elite that is organized around sucking out the state’s wealth and resources and thus makes little attempt at development. In countries at an early stage of development, an abundance of resources significantly weakens nascent democratic institutions, suppressing political parties to the extent that ‘power is weakly contested, public finances are opaque and corruption by both the elite and bureaucracy is rampant’ (Mkandawire, 2001). Thus the bureaucracy and administration necessary to distribute wealth are lacking, and this paves the way for predatory tendencies.

This description of the phenomenon is consistent with observations about the tendency to develop an elite-dominated economy. In short, the ruling elites grab the best deals for themselves or demand a large cut from those obtained by others, thereby stifling competitiveness and, consequently, broader value creation in the economy. This is a self-reinforcing mechanism in which centralized wealth serves to consolidate the political hold of the ruling elite.

² The oil and gas sector typically has few direct employment opportunities for the lower skilled; rather, most such opportunities in the sector are for the highly skilled. As a result, income inequality increases because those with a higher level of skills usually come from the highest income quintile.

Poor decision-making

Closely linked to the above is the way in which disproportionate fiscal dependence on petrodollars channelled through the state has an impact on the capacity of government to make decisions. For example, Karl (1997) focuses on the socio-political implications of petroleum revenues, arguing that the illusion of prosperity and development such income creates – together with the focus on spending as policy – reduces a government’s ability to build a successful state.

At the same time, the development of extractives raises popular expectations, which put pressure on governments to make decisions quickly. Hasty, ill-coordinated decision-making inevitably yields bad decisions. Rapid decisions on how to spend revenues may introduce distortions into the economy because there is less chance for natural adjustment. At the same time, greater wealth can weaken prudence and due diligence – making the ‘right choices’ seem less important when the prospect is one of bounty. Linked to this is the charge that investments made by resource-rich governments often fail to develop the productive base of the economy (see below).

The failure to create a productive, efficient economy

Much of the ‘failure of productivity’ argument is based on the ideas of a rentier society, citing the fundamental disconnect between reward and effort. In this context, reference is made to a phenomenon linked to the Dutch disease argument discussed above – namely ‘crowding out’. When a large extractive project in effect stakes first claim to scarce resources, the rest of the economy finds it difficult to secure factors such as capital, labour and specialist services, all of which gravitate towards the cash-rich sector.³

At the same time, centralized wealth flows can lead to top-heavy government prone to market control or intervention. A key ‘distorting’ aspect is the impetus for government to subsidize chosen sectors and key commodities. In the case of domestically produced energy resources, for example, there is a tendency to provide them very cheaply to stimulate job-creating industries and prop up the agricultural sector. In the 1970s and 1980s, many resource export-dependent governments adopted an industrial policy based on ‘import substitution’. Such a policy invariably has two components: the introduction of subsidies and growing protectionism in the form of import controls and lack of taxation. Inefficient subsidies also help to explain why many resource-rich countries have failed to promote a competitive manufacturing sector.

Dependence on government support often becomes a major stumbling block to productivity and fiscal sustainability. Spending to keep down domestic fuel and power prices, and the inability to attract investment for refining and power infrastructure, for example, have led to rising bills for several oil-exporting countries, including Nigeria and Iran. Under such conditions, governments have to bridge a growing gap between the international price of fuel imports and domestic fuel prices. At the same time, they often invest in national development projects beyond their means in anticipation of growing resource revenues. Borrowing to fund investment and government spending only compounds the problem, since the loan must be serviced and repaid.

³ Nevertheless, there may well be some spill-over benefits such as the presence of high-tech, high-quality foreign companies that set standards for the provision of services. This can, in turn, encourage the provision of technical education, which would otherwise not be available.

Increased conflict in society

Yet another strand to the ‘resource curse’ argument is the alleged propensity for more social conflict (Collier and Hoeffler, 2004; Ross, 2012). Several factors can be cited in this context. Large resource revenues create a pot that is worth fighting for – since whoever is in power is better able to plunder that pot. Such revenues have been used to directly fund government actors in civil wars, as in the case of Angola before 1992; and even if there is no active conflict, they have still tended to generate much higher levels of military spending. With respect to oil in particular, the military-industrial complex of such countries can use petrodollars to buy defence equipment from the major importing countries – particularly the US – that rely on their products (Oweiss, 1974). Whether this increases security or the potential for conflict must be considered on a case-by-case basis, but it is clear that more government revenue spent on military equipment means less spent in other areas.

War and strife are regressive – they hurt the poor more than the rich since the former lack the resources to mitigate their negative effects.

Conflict affects poverty in several ways. War and strife (like inflation) are regressive – i.e. they hurt the poor more than the rich since the former lack the resources to mitigate their negative effects (for example, by resettling in another area). Moreover, fighting or expectations of fighting absorb resources that could otherwise go towards improving economic performance and alleviating poverty.

Further drivers of conflict include the governance and economic impacts associated with the resource curse. At the national level, deteriorating governance and judicial independence, on the one hand, and increasing corruption and inequality, on the other, are among the predictors of declining regime stability and an increased risk of civil unrest and conflict.

Degradation of environment and human rights

The impact of the projects themselves on the local environment, livelihoods and communities is considered another symptom of the resource curse. Here the proof of damage done is often clearest. Extractive projects may entail, among other things, the loss of land, the relocation of those inhabiting that land, the destruction of wildlife habitats and heavy local pollution. Where projects compete for land and water with artisanal mining, subsistence agriculture or cotton production, for example, they can severely undermine the livelihoods of the local population. Environmental damage is also linked to issues of local social and socio-economic rights and may result from community-company conflicts that can turn violent, as seen in Nigeria, Ecuador and Papua New Guinea.⁴ If an extractive project is controversial or takes place in a conflict-ridden area, security for the industry and its labour force provided or supported by the central government may lack accountability and may ultimately be responsible for abuses of human rights.

⁴ See Stevens et al. (2013) and supplementary materials to that report, available at <http://www.chathamhouse.org/publications/papers/view/195670>; and Lujala and Rustad (eds) (2012).

This aspect of the resource curse tends to be neglected in the economics literature, which by its very nature has a strong orientation towards the aggregate macro impact. Such neglect is reinforced by the poor macro-economic data at the provincial level available to many countries.⁵

Challenges to the theory

Over the last decade, traditional views of the resource curse, which are outlined in the appendix to this paper, began to be increasingly challenged. These challenges are divided below into various broad areas.

Empirical challenges

Some countries have not suffered the curse

A number of studies have given examples of resource-rich countries that have been blessed rather than cursed: the most commonly cited are Botswana, Chile and Indonesia before 1997 and Malaysia. All of these have overcome many of the obstacles, potential or otherwise, identified above and implemented sound pro-poor strategies. Norway, too, which is not only rich in resources but rich in general, is often considered a country that has avoided the curse – although as Box 1 below explains, this is not a useful example in this context. Australia and Canada, as well as the US and the UK in the nineteenth century, could be seen as falling into the same category as Norway.

Box 1: Why Norway is a nuisance

There is general agreement in the literature on the role of extractives in economic development that Norway got it right. The country managed to develop its interests in North Sea oil without suffering the usual symptoms associated with the resource curse. At the same time, it managed to diversify its economy away from dependence on crude oil production while accumulating huge financial reserves. For this reason, it is often held up as the prime example of how to make the most out of resource extraction. Indeed, through its Oil for Development programme, the Norwegian government offers advice to many countries that began producing oil only recently.

However, the Norwegian example was born of very special circumstances. When it was first developing oil, in the early 1970s, Norway was a long-established fully functioning democracy. It had well-functioning political institutions that were wholly transparent and a history of very low levels of corruption in the public sector. It also had a small population that was extremely well educated, and only a very small percentage was considered to be living in poverty. Moreover, Norway has a history of shipbuilding and significant experience of working at sea in various contexts – a great advantage considering that its oil deposits are offshore.

Such conditions are difficult to find elsewhere, especially among the countries that have potential extractive resources. Norway, arguably, is a special case – the only way its experience can be replicated is to start with 4.5 million Norwegians. Unfortunately, many policy-makers fail to grasp that basic reality.

⁵ Environmental impact is an area in which, over the past 20 years, there have been many developments in terms of international standards and norms adopted by industry and reinforced by national regulation and legislation. Thus this issue has been tackled in a more systematic fashion than have economic policies; and benchmark standards and processes are in place to deal with it. For a detailed discussion, see Dietsche (2014).

Selected prejudices

Some studies that suggest strong links between resource extraction and negative economic impacts have been criticized for selecting countries on the basis of their being ‘resource-rich’. Part of that discussion is devoted to whether the resource in question is a point resource, such as oil and minerals, or a diffuse resource, such as agriculture. The difference between the two is whether the deployment of resource revenues is in the hands of just a few or many. For his part, Auty (2001) argues that the problems of the resource curse are better attributed to ‘rent’ and, more generally, rent cycling. He contends that rent – as income not generated by productive labour within the country – can come from a number of sources, including foreign aid, government price manipulation and even worker remittances, and that the ‘oil curse’ is just another such source, albeit a very important one.

Others have questioned whether the problem stems from policy choices and the role of the state in the economy. Several countries have extensive below-ground resources and resource production but are included in the ‘resource-rich’ category because they have other economic strengths – the US and China are examples of such countries. Some of the literature has drawn a useful distinction between resource-abundant economies, such as the US, and resource-dependent economies, such as Venezuela, and attributes resource-curse symptoms to resource dependence (Auty, 2001). In other words, the term ‘resource-rich’ tends to be applied to countries whose prospects of developing the productive sectors of their economies are poor. As a result, the selection of countries may be instrumental in determining what is presented as the evidence for the impact of the resource curse.

With respect to extractive industries in fragile and conflict-affected countries, a small body of academic and practical material suggests that, under the right circumstances, resource development can help contribute to peace. One argument is that the development of the extractive industry – albeit with appropriate measures to address the negative impacts of the resource curse – can deliver ‘peace dividends’. In other words, it can help support stable government institutions and increased public expenditure and generate broad-based, inclusive economic growth, which in itself contributes to improved socio-economic conditions and generates a sense of hope among the local population. The current drive by donors and multilateral banks to promote extractives-led growth strategies and private-sector investment in fragile and conflict-affected countries can be understood in this context (Bailey et al., 2015).

Too short a timeframe for drawing conclusions on long-term impact

Another criticism of the literature on the resource curse is the timeframe on which many studies are based. Because interest in this issue was triggered by the oil price shock of the 1970s, many studies focus on the period 1970–90. However, that may be much too short to draw any conclusions on longer-term impacts. In the case of many countries, what is presented as evidence for the existence of a resource curse weakens considerably if the timeframe is longer.

Maloney (2002) has challenged both the methodology and the conclusions of studies that identify the existence of the resource curse. He argues that there is little evidence based on long-term data that resource-abundant countries generally underperform; indeed he contends that, on the contrary, resources have played an integral role in the success of many successfully industrialized countries. His argument starts from the not unreasonable proposition that growth processes take place across the long run and probably cannot be convincingly summarized by cross-section regressions of a highly turbulent 20-year period at the end of the twentieth century.

Econometrics queried

Finally, an increasing number of academics, including Van der Ploeg and Poelhekke (2010), have challenged the empirical work on which arguments for the existence of the resource curse depend. In particular, some of the more simplistic econometric analysis of earlier studies has been questioned on technical grounds.⁶

Other challenges: some countries are simply better off

Another problem with the conventional approach is related to a group of countries – namely, the six Gulf Cooperation Council (GCC) members.⁷ While over-dependence on petroleum revenues and unsustainable economic trends may be a problem in the future, it is difficult to argue right now that resource exploitation has had a negative impact on either their growth rate or their living standards. At the risk of overstating the case, these countries probably would not exist at all – and certainly not in their current guise – without oil and gas revenues. Before the development of their oil and gas resources, they were poor economies based largely on low-value pastoral activities, fishing, pearling and small-scale entrepôt trade. If a country is starting from ‘nothing’, economic growth based on extractive resources looks like a rather good option. The way in which some of the GCC countries have developed may elicit disapproval from various quarters on humanitarian grounds – not least over their treatment of expatriate workers. But it is clear that the nationals of these countries are significantly better off in aggregate as a result of large extractive revenues – regardless of whether measurements are in terms of per capita income or other components of the UNDP Human Development Index.

If a country is starting from ‘nothing’, economic growth based on extractive resources looks like a rather good option.

The implication of the above discussion is that there is no single solution – or what has been derided as the ‘silver bullet’ – for avoiding the resource curse. However, as is argued in the appendix to this paper, by pointing to ‘good governance’ and/or ‘better management’ of the sector, some experts have tried to identify such a ‘bullet’; that is, a single explanation of the resource curse that reverses the causality (Easterly, 2002). Thus the story goes that for various institutional reasons, there exist failing economies for which the only viable sector is oil, gas and/or minerals – in other words, that sector is a beacon of success in what would otherwise be a sea of failure. According to the same narrative, extractive industries can survive in environments where few other industries could, but they do not automatically promote the development of a diversified economy.

⁶ These arguments point to a number of technical econometric issues – for example, the extent to which the variables are endogenous. At the same time, there is concern that the negative correlation between growth performance and resource depletion may merely be picking up cross-country variations in per capita income. Similarly, some scholars have found that the negative correlation between resource abundance and labour productivity disappears when a more modern and appropriate statistical test is used.

⁷ Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

Problems with the analysis

Do modern trends in theory simply reflect the commodity price cycle?

As discussed above, the modern theoretical discourse on the resource curse was triggered by the first oil price shock of 1973–74, spawning a huge literature that quickly moved beyond oil and gas into minerals and that initially focused on the period between 1970 and 1990. In the words of Ross (2012), oil-producing states were indeed economically troubled during that period. However, there is evidence showing that before the 1970s, resource-abundant countries grew faster than resource-deficient ones. Because of oil price fluctuations, results are likely to be distorted in certain periods. Moreover, it is suggested that the high oil prices of the 1970s led many oil producers to borrow more than they needed, creating a debt problem that caused slower growth. Arguably, this problem had more to do with external actors (multilateral and foreign donor financiers and international consultancies) encouraging and facilitating debt for infrastructure than with the resource phenomenon itself.⁸

In sum, the resource curse is not an immutable law of economics, and to suggest its inevitable presence is an oversimplification. History shows that different countries have developed resources with differing results, ranging from spectacular success to woeful failure.

The evolution of the literature suggests that the commodity price cycle may influence thinking. After the resource curse debate had peaked in the context of looking back at a period of 20–30 years of falling commodity prices, criticism of the theory began to emerge in the early to mid-2000s as the international prices of oil and other commodities were rising. But the correlation is loose and many other factors are involved, including:

- **Various fashions in economic analysis.** Thus a period in which one worldview becomes popular seems inevitably to spawn growing scepticism and challenges to that view.⁹
- **The investment cycle in resource projects.** It is investment that drives interest in the resource curse, since it largely determines the extent and nature of the impact, although the investment cycle is driven to a large extent by the price cycle.
- **Accumulated knowledge of how to manage windfalls.** For example, Luciani (2011) argues that since 1990, there is evidence that many resource-rich countries have learned lessons and developed policies more favourable to growth – in particular, policies on dealing with price volatility.
- **The post-colonial perspective.** This questions whether aspects of the resource curse, such as ‘rentierism’, are just another form of prejudice against the global South.

⁸ See, for example, the cases cited in Kretzman and Nooruddin (2011).

⁹ As A. O. Hirschman notes, ‘In the social sciences ... the enunciation of a new paradigm ... is often followed almost immediately by a persistent onslaught of qualification, criticism, and outright demolition ...’ see Hirschman (1977), p. 67. Furthermore, this is not an exclusively social-science phenomenon, as Thomas Kuhn has demonstrated in his work on paradigm shifts – see Kuhn (1996).

All generalizations are wrong

The shortcomings of resource-curse theories are essentially attributable to economists' obsession with the 'one big explanation' or what was described above as the 'silver bullet' solution. Both social and political science have a strong tendency towards excessive generalization so that one theory can be made to fit every case. That this causes problems in analysing the resource curse is obvious. Countries are very different from one another. They have different histories, social and economic structures and cultures. As Table 1 below shows, despite scoring fairly low on the UNDP Human Development Index, the emerging or prospective producers form a heterogeneous group. Just 2.4 per cent of the Zambian population enrolls at university, for example, compared with 38 per cent in Bolivia. More than 70 per cent of Mongolia's population lives in urban areas, compared with 15 per cent in Uganda. Some have existing extractive industries that dominate the economy, whereas others have a more diversified export profile. It should be noted that a number of particularly fragile and conflict-affected countries, such as Somalia, Afghanistan and Myanmar, exhibit data gaps. This is an indication of the challenging political and development conditions that investors would face in such countries.

Given this amount of diversity within the group of emerging and prospective producer countries any attempt to provide general explanations and/or blanket policy recommendations is likely to fail.¹⁰ Many have tried over the years to provide the 'one big explanation', ranging from the dialectics of Karl Marx to W. W. Rostow's 'stages of growth' (Rostow, 1963). They invariably fail.¹¹ Inevitably, attempts to paint the characteristics of very different countries with the same brush invite criticism. Auty has suggested this approach has had three unfortunate consequences for research on the resource curse.¹² First, insufficient attention is paid to changes in the intensity of the resource curse over time. Second, as noted previously, other revenue streams – notably, foreign aid, remittances and regulatory rents – arising from the manipulation of relative prices, which can replicate resource-curse symptoms, are neglected. Third, potential interactions between explanatory variables are not taken into account on the grounds that they are seen as competing whereas they may well, in fact, be mutually reinforcing.

The 'one big explanation' leads to the 'one size fits all' response. The now widely derided Washington Consensus is such a response to the problem of poor countries – it explained their low level of development by pointing to domestic policies that constrained the operation of the free market. Currently, 'better management' of the sector is the focus of the prevailing policy narrative; and it is based on the patently wrong assumption that the same type of sector management is suitable for every country.

¹⁰ Economists pay a great deal of attention to the 'Law of Parsimonious Explanation', according to which there can be only a relatively small number of caveats, otherwise the explanation loses value in terms of its role in analysis.

¹¹ They are examples of tautological hypothesis. The authors observe the world and derive a hypothesis about how it works. In an effort to be 'scientific', they test their hypothesis against evidence. However, since that evidence is the original source of their ideas the hypothesis is inevitably proved.

¹² In a private communication with the authors of this paper.

Table 1: Selected socio-economic characteristics of emerging and prospective producer countries*

	Population, 2013 (million)	Population growth rate, 2013 (%)	Infant mortality rate, 2013 (per 1,000 live births)	GDP per capita PPP, 2013 (current international US\$)	Gini coefficient (%; 0 = perfect equality)	Main non-mineral exports	Tertiary education, gross enrolment ratio (%)	Unemployment, including estimates (%)	2014 CPI ** ranking (out of 174)	2013 HDI*** ranking (out of 187)	Urban population, 2013 (% of total)	Income share held by top 10% of population	Poverty/headcount ratio at US\$2 a day PPP (% of population)
Afghanistan	30.5	2.4	70.2	1989.613	n/a	Opium, fruits and nuts, handwoven carpets, wool, cotton, hides and pelts	3.74	8.2	172.0	169.0	25.9	n/a	n/a
Bolivia	10.7	1.7	31.2	6129.563	47	Soybeans and soy products	37.69	2.7	103.0	113.0	67.7	34.0	12.7
Republic of Congo	67.5	2.7	86.1	746.7551	40	Lumber, plywood, sugar, cocoa, coffee	10.36	53	152.0	140.0	41.5	35.0	57.3
DRC	4.4	2.5	35.6	5867.046	44	Wood products, crude oil, coffee	8.23	n/a	154.0	186.0	64.5	30.0	95.2
Mongolia	2.8	1.5	26.4	9432.656	37	Clothing, livestock, animal products, cashmere, wool, hides, fluorspar and other non-ferrous metals, coal	61.1	7.9	80.0	103.0	70.4	28.0	n/a
Mozambique	25.8	2.5	61.5	1045.381	46	Aluminium, prawns, cashews, cotton, sugar, citrus fruits, timber, bulk electricity	4.85	17	119.0	178.0	31.7	37.0	82.5
Myanmar	5.3	0.9	39.8	n/a	n/a	Wood products, pulses, beans, fish, rice, clothing, jade and other gems	13.81	5.2%	156.0	150.0	33.0	n/a	n/a
Somalia	10.5	2.9	89.8	n/a	n/a	Livestock, bananas, hides, fish, charcoal, scrap metal	n/a	n/a	174.0	n/a	38.6	n/a	n/a
Sudan	38	2.0	51.2	3372.149	35	Cotton, sesame, livestock, groundnuts, gum arabic, sugar	15.14	14.8	173.0	166.0	33.5	27.0	44.1
Tanzania	49.3	3.0	36.4	1774.625	38	Coffee, cashew nuts, cotton	3.92	3.5	119.0	159.0	30.2	31.0	73.0
Uganda	37.6	3.3	43.8	1410.029	45	Coffee, fish and fish products, tea, cotton, flowers, horticultural products, gold	9.06	3.5	142.0	164.0	15.4	36.0	64.7
Zambia	14.5	3.2	55.8	3180.601	57	Electricity, tobacco, flowers, cotton	2.39	15.9	85.0	141.0	40.0	47.0	86.6

* The countries listed in the table were selected on the basis of whether they could be considered to be emerging or prospective producers during the period 2006–12. ** Corruption Perceptions Index. *** Human Development Index.

Sources: World Bank Development Indicators 2015, World Bank poverty and inequality database – latest year available, UNESCO Institute for Statistics, International Labour Organization, Transparency International.

Prescriptions Issuing from the Extractives-led Growth Agenda

Our review of the resource-curse literature and its critique suggests that if any useful advice or recommendations are to be made, it is necessary to take a nuanced look at the impacts of an extractive project or resources-sector development on a country-by-country basis.

The extractives-led growth agenda has been influenced by the academic debate but is essentially normative in terms of orientation. Although many of its proponents would accept various conclusions set out in the resource-curse literature about the likely effects of that phenomenon, they are focused on recommending what measures countries should take to benefit from their resources. For example, the World Bank states: ‘The Extractive Industries Source Book project [an online resource funded by the World Bank] is driven by a mixture of optimism and hope about the potential of the extractive industries for positive, sustainable development, particularly in the world’s poorer countries and in post-conflict societies.’¹³ This view starts from the premise that a wealth of resources is not in itself damaging and that ‘governance’ – by the host government, the investing company and by NGOs – is the way to avoid negative outcomes from the extraction and marketing of those resources.

At a minimum, extractives-led development assumes that resources that have a high market value will be developed and therefore focuses on the best way to develop them.

At a minimum, extractives-led development assumes that resources that have a high market value will be developed and therefore focuses on the best way to develop them. At a maximum, it suggests that even the least developed country could and should use its below-ground resources as the basis for economic growth – as long as it is prepared to sign up to and follow all the international initiatives on good governance. The good governance prescribed generally involves optimum contractual terms, revenue transparency, institution-building, use of stabilization funds and local capacity-building to service, and benefit from, the sector. The main imperatives include:

- Establishing the rule of law and strong institutions that will push through regulatory reform and enforce laws;
- Using transparent and competitive contracting to deploy best operators, avoid conflicts and allow for adaptation to changing commodity prices;
- Smoothing revenue volatility by using sovereign wealth and/or future generations funds;
- Spending revenues on long-term public infrastructure and debt repayment;
- Ensuring the transparency of revenues and spending from the sector;

¹³ See <http://www.eisourcebook.org/>.

- Increasing accountability and democratic participation (ranging from clear mandates for entities governing the sector to capacity-building for journalists and civil society);
- Accounting for, minimizing and compensating for the environmental and socio-environmental costs of resource-extraction projects; and
- Strengthening linkages between extractive industries and the local economy and ensuring training and capacity-building to service the sector.¹⁴

The above constitute simply a selection of recommendations made in the various guides on the sector and thus cannot do justice to the nuanced discussion and analysis contained in the guides. Most of the advice is eminently sensible. However, backed by the public statements of policy-makers and industry leaders, it has had the effect of reinforcing the message that: (a) resources provide an opportunity for economic development that poor countries should not miss; (b) governance processes and mechanisms can prevent potential negative impacts; and (c) by concentrating on establishing good governance, the extractive sector can become not only the driver of economic growth but also a beacon of good governance for the rest of society.

The plethora of initiatives that were launched in the early 2000s has been criticized and subject to revision in the last few years.¹⁵ Some have criticized voluntary governance initiatives for offering a relatively easy way for governments to gain international legitimacy since, in practice, they paper over official inadequacies (Keblusek, 2010, p. 13). Others have raised the question of whether ‘best practice’ is the right advice for countries that have newly discovered resources – especially those whose governance capacity is currently low. This recent change in thinking, which includes Chatham House’s work on good governance of the petroleum sector, looks at how practice and objectives might be adapted to new and emerging producer-country contexts, in which experience and capacity are usually limited.¹⁶ It results from several years of stakeholder-led dialogue through which it became obvious that best-practice standards established by experienced producers could not be effectively transplanted into a country with no experience of extracting resources (Marcel (ed.), 2013).

Achieving institutional good governance in countries with a relatively low capacity to manage the extractive sector at the outset will be a long, hard slog right from the very beginning. It will require both sustained political will and a measure of societal stability. At the same time, while it is known what needs to be done for extractives-led development to have a positive outcome, the reality of the political economy that develops around an extractive industry or other (similar) forms of rent may make it simply impossible to achieve that outcome. In its article titled ‘The twilight of the resource curse’, for example, *The Economist* concludes that ‘with better education systems, investment in infrastructure and sensible regulatory reforms, the [African] continent could completely break the spell that has held it back so often in the past’.¹⁷ The desirability of the three conditions cited is beyond dispute, but the ability to establish such conditions remains severely hampered by the dynamics identified in the ‘classic’ resource-curse explanation.

¹⁴ See, for example, Natural Resource Governance Institute (2014), *Natural Resource Charter*, 2nd ed., p. 28 (available at http://www.resourcegovernance.org/sites/default/files/NRCJ1193_natural_resource_charter_19.6.14.pdf); Calder (2014); Africa Progress Panel (2013); Dobbs et al. (2013); Heuty (2009); and the *Extractive Industries (EI) Source Book (2015)*, available at <http://www.eisourcebook.org>.

¹⁵ See, for example, Keblusek (2010) and Darby (2010) (available at http://www.transparency-initiative.org/wp-content/uploads/2011/05/natural_resources_final1.pdf).

¹⁶ For example, is it appropriate for a relatively poor country to focus on separating between policy-making, regulation and operations – as Norway does – when there will be neither a sufficient number of qualified staff nor enough knowledge accumulated about the sector and/or the geology? See Marcel (ed.) (2013).

¹⁷ ‘African economic growth: The twilight of the resource curse?’, *The Economist*, 10 January 2015.

To highlight the challenges to implementation, the following subsections discuss two governance imperatives for avoiding the resource curse: stabilizing revenue flows through the use of managed funds and improving transparency.

Stabilization funds

Producer countries are advised to establish stabilization funds or sovereign wealth funds (SWFs) (see Box 2) to neutralize the impact of windfall revenue so that the various negative macroeconomic and associated resource-curse impacts discussed above can be avoided. Of the 53 SWFs based on extractive revenue that are currently in operation, half were established between 2005 and 2012.¹⁸ This reflects the period of historically high commodity prices and the increased focus on revenue management. Producer countries that have SWFs include Australia, Bolivia, Chile, Gabon, Ghana, Mongolia and Turkmenistan, while the US states of West Virginia and North Dakota have established their own such facility too.

Box 2: Using SWFs to neutralize the negative impact of resource revenues

Many resource-rich countries have established SWFs into which the revenues accrued from natural-resources extraction can be deposited.^a The motivation for having such funds varies from country to country but is often one or more of the following: stabilizing revenue streams to counter the effects of commodity-price volatility; providing an intergenerational saving mechanism; avoiding Dutch disease by sterilizing foreign-exchange inflows; moderating capital spending in an attempt to ensure that the domestic revenues directed into the economy do not exceed domestic absorption capacity; and, finally, ensuring arm's-length management of revenues that is both transparent and insulated from day-to-day politics.

Another motivation is that, in many cases, the comparative advantage of an extractive producer means that while domestic spending to diversify the economy may be sound in principle, it will take a long time in practice to develop the non-oil sector to any serious extent. This implies a very low rate of return on domestic investment. For this reason, some funds – such as those of Kuwait, Norway, Malaysia and the United Arab Emirates – invest their revenues abroad in order to diversify assets and income.

Some funds are managed directly by the existing fiscal authorities and operate within the budget framework without revenues being earmarked for any special purposes; they are often termed 'virtual funds' or 'informal funds'. So-called formal funds are frequently managed by specially appointed boards and operate (at least in theory) partly or wholly outside the government's budget; often, the revenues derived from formal funds are earmarked for special purposes. In general, the degree to which any fund is successful is very much a function of the institutional capacity of the country to manage it effectively.

Many developing countries have established funds (both formal and informal) with the specific objective of mitigating the rent-seeking and corruption that is characteristic of resource-rich but cash-poor countries. They hope that the creation of a visible focal point for revenue management will create a constituency for improving such management. Consequently, many funds have clear delineations of responsibility for revenues and prescribed mechanisms for channelling that money to achieve positive outcomes from its use.

^a The issues related to SWFs are extensively discussed in Stevens and Mitchell (2008).

¹⁸ According to the fund rankings compiled by the Sovereign Wealth Fund Institute, which was last updated in May 2015 (available at www.swfinstitute.org/fund-rankings, accessed on 7 May 2015).

The record of the SWFs is mixed. Those that have been successful are in democratic or partly democratic countries that have well-functioning, transparent institutions and predictable and stable legal frameworks. Characteristics common to such funds are simple and transparent regulation, as well as the public availability of information about them. Thus, managers are accountable not only to the government and the parliament but also to the public, which, in itself, generates citizens' interest in fund management. In other words, the funds can be seen as the manifestation of a compact between the government and its citizens whereby the latter are given a sense of ownership of the natural-resource rents and their desire for public accountability is increased.

Ideally, the funds operate in a benign fiscal context in which fund managers can resist political pressure to overspend. Under such conditions, governments can neither misappropriate nor misallocate natural-resource revenues. For its part, the IMF has argued that the key to success for such funds is the quality of public financial-management systems (IMF, 2007). However, SWFs do not necessarily prevent governments from pursuing unsustainable fiscal policies or using the funds' resources as collateral for reckless borrowing.¹⁹

Such problems are exacerbated when the executive branch of the government is subject to few restraints, and when checks and balances are weak. In such circumstances, the rules and regulations governing the funds are often changed or not respected. A more fundamental problem is that of kleptocracy. In such a case, an SWF is not advisable since it is a pot to be raided by the government.

Transparency initiatives

Other policy advice focuses on the drive for improved transparency and institution-building in general, and greater transparency in regulating the sector in particular. A more transparent approach to attracting competition from international oil companies is another such focus.

The Extractive Industries Transparency Initiative (EITI), the NRGi (which resulted from the merger of the Revenue Watch Institute and the Natural Resource Charter) and the Publish What You Pay (PWYP) campaign have sought to persuade governments and companies to make their accounts publicly available. In particular, EITI has drawn considerable interest from oil- and gas-exporting countries and companies, and has encouraged their engagement in the initiative. Many examples can be cited of its success in helping build capacity to investigate and expose financial flows to and from the sector in countries that have signed up to the initiative. However, there has been criticism that such disclosure shows only some of the data needed to help promote greater accountability. In particular, national oil companies tend to slip under the radar (Stevens, 2003b). Moreover, there is sometimes little or no recognition of efforts made if the results do not make the (very demanding) grade, and this discourages low-capacity governments that are trying. And, finally, there is the question of what to do with the data once they have been made available.

Transparency is, of course, the first step towards accountability. Society has to know how much the sector is producing for, receiving from and giving to the government before it can hold anyone

¹⁹ See Stevens and Mitchell (2008), Appendix 1: The Case for and against Oil Funds (available at <https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/rddd0608theory.pdf>).

accountable for corruption or misuse of funds. However, transparency does not necessarily mean that accountability and better management of revenues will follow.²⁰

At the same time, predatory elites in producer countries can weaken initiatives to improve transparency in the sector. The Angolan government, for example, censured BP heavily after the company had published its operational data in 2001 without securing prior approval from state officials. It sent an open letter addressed to all oil companies operating on Angolan territory in which it threatened to throw BP out of the country and ensuring that all involved understood who was in charge. No other company published data after that incident except the Angolan national oil company, Sonangol.

Many country and international experts in the field have contributed to the body of advice on better sector management, and their contributions should be acknowledged for having provided a wealth of guidance for prospective and established producers as well as for donors and multilateral financiers. However, they are not in themselves sufficient justification for encouraging a country to bank on its resource sector for national development. The experience of following even the best laid plans for improving governance has been mixed. And signing up to such reform is no guarantee of successful development: while poorer countries such as Mozambique, Mongolia and Guinea have made progress in developing some of their institutions, each continues to face substantial extractives-linked challenges to socio-political stability. The recent slump in commodity prices and the downturn in investment will only increase those challenges significantly.

In short, the emphasis that the extractives-led growth agenda places on the opportunity offered by the sector may overrate the ability of processes, practices and policy to prevail over some systemic and psychological responses to large flows of income. It will remain a huge challenge for a number of countries to translate extractive-sector growth into broader socio-economic development – even for those that are able to continue to attract investment and maintain political stability.

Alternative development agendas might be overlooked

The extractives-led development rhetoric may not only overrate the ability of poorer countries to rise to the considerable challenges they face. Perhaps more important, it may also obscure the possible comparative benefits and savings involved in developing other sectors, or developing the extractive sector at a much slower pace than that advocated automatically by industry and investors. Salient questions in this context are:

- To what extent are the countries that today receive the lion's share of extractive investment facing structurally different conditions from those of the previous generation of resource producers, which is the source of much of the evidence about the resource curse?
- Given the increasing prominence of climate-sensitive development planning and the growing interest of countries in avoiding the negative impacts of emissions-intensive industrialization, can extractive-sector development be compatible with clean-environment efforts?

²⁰ The head of the EITI Secretariat, Jonas Moberg, responded to critics in 2009 by saying that '[T]he EITI does not suggest that it is the solution to what has become known as the resource curse'; rather, he argued, it is an essential first step in the process of translating resource wealth into benefits for citizens. See Moberg, J. (2009), 'EITI expectations – necessary but not sufficient', EITI blog (available at: <https://eiti.org/blog/eiti-expectations-necessary-not-sufficient>).

- Should emerging or prospective oil, gas and mining producers be encouraged to develop their nascent extractive industries as a basis for broader development?
- Or should these countries be warned about the negative consequences of the resource curse and seek to develop other sectors?
- Do shifts into downstream processing constitute a significant move away from hydrocarbons-driven development?

The next section addresses the first two of the above questions.

New Producers Face a Changing Global Context

It is not only the experience of the last decade or so that challenges the wisdom of the extractives-led growth agenda. Contextual factors also play a role – namely, the downturn in commodity prices, strengthening global moves to displace fossil fuels in the energy mix, mounting competition for resources that are closely linked to environmentally friendly technologies in the extractive industry such as clean water and air, and growing pressure for a diverse ecology. Those factors pose questions about both the extent to which below-ground resources can serve as future sources of income and the reliability of existing development models.

Commodity markets can go down as well as up

The steep decline in the oil price in the second half of 2014 – which had been preceded by several commodity price dips – demolished the main assumption of the extractives-led development agenda: that prices of raw materials would continue to increase as global demand grew and well-established sources were exhausted.

Uncertainties cloud the market outlook for the short to medium term. The end of the commodities super-cycle – which resulted from factors such as the discovery of the new sources of both oil and gas and slower growth in demand for energy and mineral resources – is prompting several international companies to cut back on investment.²¹ That development gives rise to new questions for emerging producers:

- To what extent will planned projects be implemented and deliver resource revenues?
- What will be the revenue contribution of those that are implemented relative to projected public finances?
- Given tighter profit margins on those projects, will investors look more closely at country risks, including poor sector management and limited institutional capacity to support project development and ensure that it meets international standards – which have been raised significantly over the past 20 years?

Such questions do not mean that new or prospective producers will be unable to benefit from developing below-ground resources. Even at US\$40/barrel, the price of oil is still historically ‘high’, while a lower oil price may in any case benefit some of the other mineral industries because the cost of transportation and smelting goes down.²² However, expectations about revenue will need to be altered.

²¹ Several companies – such as the oil and gas giants BP and Total, the leading services companies Schlumberger and Halliburton, and the mining majors BHP Billiton and Rio Tinto – have made sweeping cuts to capital spending and staff and since the beginning of 2015. Some mining majors had already begun that process during previous falls in commodity prices.

²² Prices did not exceed US\$40/barrel in 2013 US\$ until after 2003; moreover, it was the first time they had done so since 1986 (see *BP Statistical Review of World Energy 2014*).

This poses a political challenge, especially for poorer countries. Since around 2005 many countries have responded to higher commodity prices by attempting to revise contracts, regulations and tax and royalty regimes for foreign companies in order to obtain a larger share of their resource wealth.²³ Some of those measures were only just being implemented when international prices began to falter. Now the DRC, Zambia and South Africa, among others, face the uncertainty about the future impact of reforms in the current climate on both new and existing investments and jobs.²⁴ Such issues often polarize the national political debate.

In Zambia, for example, where copper provides two-thirds of export revenue and more than a quarter of total government revenue, the government must figure out how to pay a higher public-sector wage bill with lower revenues. While GDP growth exceeded 10 per cent in 2010 and is forecast to remain above 6 per cent throughout 2016, some 40 per cent of the population continues to live in extreme poverty.²⁵ A long-planned increase in open-pit mining royalties from 6 per cent to 20 per cent (many mines currently pay no tax whatsoever) entered into force on 1 January 2015. However, the threat of mining companies withholding capital and cutting jobs in response to declining profit margins prompted the country's new president to call for that hike to be revised.²⁶

Meanwhile, several new producers have borrowed heavily on the back of high commodity prices. For example, Mongolia's public debt more than doubled as a percentage of GDP between 2011 and 2014, and the IMF is projecting it to exceed 80 per cent in 2015. Many new producers are now facing 'balance-of-payments pressures on account of low FDI and weak commodity prices, as well as expansionary macro policies', which is IMF-speak for governments spending beyond their means and having to borrow to stay afloat.²⁷

The impact of changes on the oil markets since June 2014 is a salutary reminder of what the resource curse is all about: namely, creating an economy overly dependent on revenue from a volatile and finite source.

In the seven years that followed its discovery of oil (in 2007), Ghana accumulated growing fiscal and current-account deficits and racked up unprecedented levels of public debt. Moreover, the cost of living went up some 17 per cent between 2013 and 2014 (Adams, 2015). In April 2015 the Ghanaian government agreed another three-year credit facility with the IMF, which was conditional on economic reforms being undertaken.²⁸ Owing to the lower commodity prices and thus the reduced value of extractive assets, the cost of borrowing has risen for producers too. Indeed, the impact of changes on the oil markets since June 2014 is a salutary reminder of what the resource curse is all about: namely, creating an economy overly dependent on revenue from a volatile and finite source.

²³ This so-called resurgence in 'resource nationalism' and the problems posed by the economic downturn is discussed in Stevens et al. (2013) – see, in particular, pp. 47–49.

²⁴ See 'Zambia's copper belt reels as price falls', *Financial Times*, 26 January 2015; 'DR Congo urged to honour mining code', *ibid.*, 27 January 2015; and 'Mining laws in focus in three African economies', *Argus*, 30 March 2015.

²⁵ According to the 2010 government survey on living standards, which found that more than 42 per cent of the population was unable to afford even the minimum food requirement. See *Living Conditions Monitoring Survey for 2006 and 2010*, published by the Living Standards Monitoring Branch of the Central Statistical Office of the Republic of Zambia (available at <http://www.zamstats.gov.zm/report/Lcms/2006-2010%20LCMS%20Report%20Final%20Output.pdf>).

²⁶ The kwacha has weakened considerably amid the decline in the copper price, but there are other reasons for its weakening too. See 'Zambia's copper belt reels as price falls'.

²⁷ 'IMF Executive Board Concludes 2015 Article IV Consultation with Mongolia', 14 April 2015 (available at www.imf.org/external/np/sec/pr/2015/pr15169.htm).

²⁸ 'Ghana gets IMF relief before bond issue', Oxford Business Group, 27 April 2015.

In the current price climate, it is the traditional producer countries that are often holding the best cards thanks to their well-established infrastructure and large sovereign wealth fund cushions. The focus on cost-cutting has made investors reluctant to accept the huge risks associated with developing mega-projects in countries that have very little capacity to provide the infrastructure and services to support those ventures. As a result, it is now more difficult for latecomers to jump on the bandwagon and will remain so in the foreseeable future.

Global moves to displace fossil fuels

Most governments, multilateral agencies, development banks and businesses acknowledge that the decarbonization of the economy is the inevitable way ahead for all countries. As the discussions at the annual international Conference of Parties to the UN Framework Convention on Climate Change demonstrate, the bones of contention are the timeframes, practices and technologies to be applied and who should meet the costs. Because fossil fuels account for around 65 per cent of emissions of greenhouse gases – mainly carbon dioxide – political attention has tended to focus on how to shift economies away from a model in which production and consumption processes depend on persistently increasing carbon-dioxide emissions. In other words, there is a general move towards a low- or zero-carbon outcome. Policies, investment and personal choices based on the vision of at least a lower-carbon future will influence the markets for fossil fuels but tend not to be taken into account in the extractives-led development agenda.

Climate-smart and low-carbon economic models may leave assets stranded

Greater understanding of climate change and how much more carbon can sensibly be emitted is influencing investment and national policies that affect demand for fossil fuels. Owing to increasing investment in research and development of non-fossil fuel energy and more efficient systems of use, it is far from certain that there will be market demand for such products beyond 2030. The Paris 2015 climate-change conference is to produce a new agreement on tackling climate change that will enter into force in 2020. That document could include legally binding emissions-mitigation targets for major consumer countries and will almost certainly involve the transfer of finance from richer countries to help poorer countries with mitigation and adaptation.

Such developments feed into the current debate about the potential for ‘stranded assets’ or, as it has now been dubbed, ‘unburnable carbon’ (Carbon Tracker Initiative, 2004; McGlade and Ekins, 2015). According to that concept, one-third of proven global reserves of fossil fuels needs to ‘stay in the ground’ if there is to be a reasonable chance of global temperature rise remaining within manageable limits. It is assumed in some quarters that international agreements and/or policies affecting demand will render some fossil-fuel reserves uncommercial to produce, thereby leading to losses for companies and countries that have invested heavily in the production of those as yet untapped resources.

Major oil and gas companies, which typically hold reserves of 10–15 years, can adjust through divestment and diversification of business activities. Countries have less flexibility. Given that the realistic timeframe for resource development (from discovery to full production) can be 10–20 years in some countries, it is worth their while considering what long-term demand may be.

The decarbonization efforts of the main fossil-fuel consumers – the advanced economies and large emerging markets such as China and India – are planned to accelerate in the coming decade, which

could create a new driver for deteriorating terms of trade with the producers. The implications of such efforts vary from resource to resource: for example, coal would be disadvantaged *vis-à-vis* gas, oils that are heavy (and therefore more difficult to extract) would lose out to light oils, while copper might fare better than iron ore. Much will depend on the rate of change in and the spread of user technology, particularly in transport and smart-grid systems. Another important factor is how goods will be produced and recycled – in other words, what advances are made in the ‘circular economy’ (an economic system in which production processes are designed to facilitate outputs being recycled as inputs) (Preston, 2012).

Turning the Resource-curse Question Upside Down

The shortcomings of the extractives-led growth agenda and the pressure under which producer countries are now finding themselves owing to dependence on commodity export revenues suggest that understanding the interactions between below-ground resources, on the one hand, and the economy and society, on the other, is as relevant as ever. Though flawed, the resource-curse literature provides important insights that should be taken into account when offering advice to new and prospective producers. The following discussion examines how resource-curse questions might be revisited in a more constructive way – one that seeks to identify possible indicators of sustainable economic development for resource exporters.

Taking the ‘leading sector’ approach

As explained in Box 3 below, there is economic logic in the argument that resource revenues can improve a country’s growth prospects, potentially unleashing a trend towards higher levels of income, savings and investment. Resource-curse studies have tended to focus on negative outcomes and to pose the question of how extractive-sector development contributed to those outcomes. But a more useful approach may be to ask why the extractive sector has in many cases failed to become the leading sector, thereby serving as the engine to improve opportunities and growth in other parts of the economy. The answer might help better inform emerging countries hoping that oil, gas and mining will become their leading development sectors.

Through such an approach, the focus is on what should have been the outcome if revenues had been well managed. Recognizing indicators of progress or lack of it demands careful thought.

The above discussion provides several clear indications of what failure means for countries with extractive revenues. Conventional approaches involve empirical testing based on an assessment of the economic performance (say, GDP growth) of such countries and drawing comparisons with countries without extractive revenues that can act as a benchmark. If the performance of the former falls below that of the latter, this indicates an attack of the resource curse. Non-macroeconomic symptoms of the curse include a growing wealth gap, an increase in conflict related to the extractive sector and declining rankings on democracy and transparency indices.

The key point here is that revenue from extractives is not income. Rather, it is simply reshuffling the country’s portfolio of assets.

However, GDP growth is a poor indicator of the contribution of the sector to the rest of the economy. The key point here is that revenue from extractives is not income. Rather, it is simply reshuffling the country’s portfolio of assets. Or, to be more precise, exchanging below-ground resource assets for above-ground cash assets. This makes it very difficult to test the sector’s contribution to the rest of the economy, as is the case for all counter-factual arguments, (i.e. what might have been if ‘X’ had happened rather than ‘Y’).

Box 3: Shouldn't resource revenues be good for emerging economies?

Two arguments support expectations that resource revenues will have a positive impact. The first is a simple, common-sense argument based on the idea that while money cannot buy happiness, it is, at least, a good down payment. According to this argument, if a country is poor, money should be of help to it. The second argument is based on economic theory. At its simplest level, it can be expressed in terms of the 'circle of poverty'. Thus low income leads to a low level of savings, which, in turn, leads to low investment, which, in turn, leads to low income. In theory, higher income generated by extractive revenues should lead to higher investment and, hence, in what is a virtuous spiral, higher income and savings. More sophisticated economic arguments are based on the Harrod-Domar growth models and dual gap analysis. The former emphasizes the key role of investment in growth, while the latter is based on the argument that increased savings may not lead to higher investment because the savings are in the national currency, and investment requires hard (i.e. convertible) currency. Extractive revenues are invariably paid in convertible currency.

The above arguments suggest that the effects of the 'resource curse' could be summed up as a missed opportunity to channel foreign investment into the extractive sector and windfalls from resource exports towards growth, thereby reducing poverty. This assertion can be framed in a slightly different way in order to open up a fruitful area for further analysis – namely, that of 'leading development sectors' or 'growth poles', which are threads running through the development of ideas related to economic history (Rostow, 1963; Perroux, 1983). Examples of a specific sector of the economy leading the charge – in effect, picking up the rest of the economy by its bootstraps – include textiles in Great Britain during the Industrial Revolution and railways in the US during the nineteenth century.^a

^a In both cases, there were abundant natural resources at the time when these 'leading development sectors' emerged.

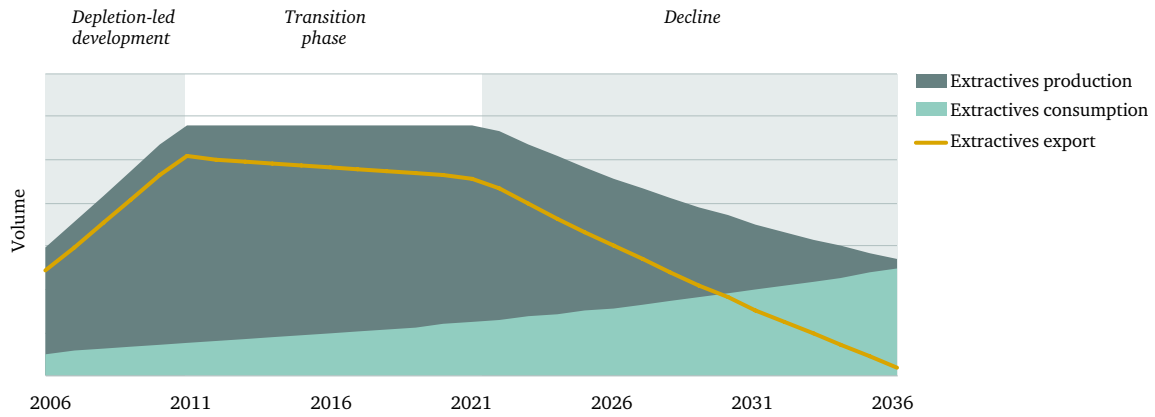
Diversification – a key indicator of an economy headed in the right direction

A possible way round this difficulty is to assess how far the country has been able to diversify its economy away from the extractive sector. A country that has succeeded in diversifying might be said to have avoided the curse and benefited from its natural resources.

The key to true diversification is to use the 'new' asset – i.e. US dollars – to create a stream of income that continues to flow when resources are exhausted. This means that, ideally, the benchmark would indicate what percentage of the resource revenue had been transferred to productive activities in the rest of the economy.

The logic of this argument can be seen in Figure 2, which presents a production profile based on an oil or gas discovery and, by implication, its revenue profile. This basic model would apply to all below-ground resources in countries in which such resources made a significant contribution to government revenue. As production increases initially, revenue should be used to promote development. By the time production reaches a plateau, the economy should be in transition from an extractives-dependent economy to a diversified one. Eventually, production will fall as a result of the depletion of resources. In terms of exports this is reinforced in the case of oil and gas as domestic consumption of energy and industry inputs based on those fuels rise. If an alternative income-generating asset has not been created by the time the export decline begins, the rest of the economy's dependence on the extractive resource becomes unsustainable.

Figure 2: Extractives and development

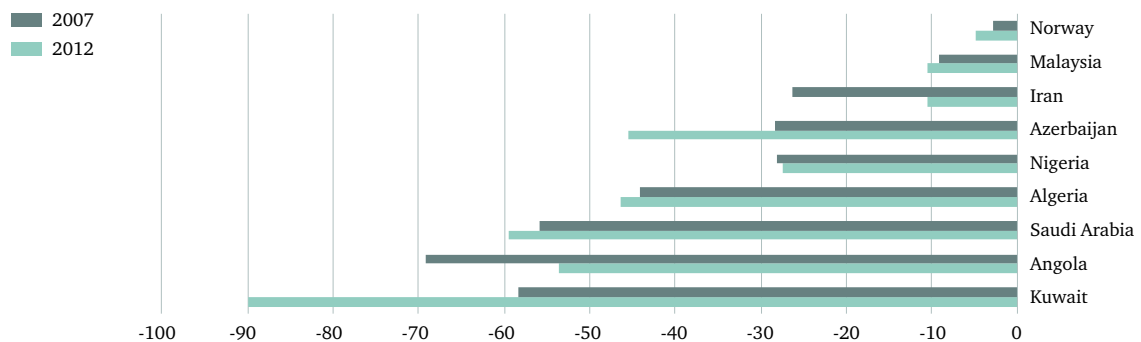


Source: Adapted from Mitchell and Stevens (2008).

Dependence on hydrocarbons is embodied in two macroeconomic concepts: the non-hydrocarbon fiscal deficit and the non-hydrocarbon current-account deficit. The economy is divided into the hydrocarbon sector and the non-hydrocarbon sector – i.e. the rest of the economy. Each sector has its own fiscal balance (the difference between government revenues generated by the sector and government spending on it) and its own current-account balance (the difference between exports from and imports into the sector). If the non-hydrocarbon sector has a fiscal or current account deficit, the implication (assuming an overall balanced budget and current account) is that surpluses from the hydrocarbon sector are supporting it. A zero non-hydrocarbon fiscal deficit and non-hydrocarbon current-account deficit means the economy is diversified. Put another way, the rest of the economy is not dependent whatsoever on the hydrocarbon sector.

Figure 3 below provides a snapshot comparison of various hydrocarbon-producing countries selected on the basis of the extent to which the non-hydrocarbon sector is dependent on hydrocarbon revenues. It shows not only the level of dependence – Kuwait is the most dependent among the countries selected – but also the change over a period of five years in which oil and gas prices reached historical highs (albeit with a significant dip in 2008).

Figure 3: The non-hydrocarbon primary fiscal balance in selected oil- and gas-exporting countries (as % of non-hydrocarbon GDP)



Notes: The 2012 figures for Kuwait, Algeria and Azerbaijan are preliminary (while the figures for 2013 and 2014 for these countries are all projected to be higher). The Iranian fiscal year ends on 20 March 20, so the data are from 21 March to 20 March of each year. Norwegian accounting practice excludes oil-related revenue and expenditure, and income from the Government Pension Fund.

Source: IMF.

To determine whether countries were ‘on track’ with diversification, the results for each country would have to be assessed not only in the context of its resource-depletion timeframe – which would clearly be longer in Kuwait than in Malaysia, for example – but also against price projections for its exports. As prices are impossible to predict, it would be prudent for countries that are highly dependent on hydrocarbon revenues to prepare for the worst.

Can diversification be sustained?

Of course, the non-hydrocarbon primary fiscal balance must be treated with caution. Economic exchanges in energy-intensive industries such as petrochemicals and aluminium will be counted as the non-hydrocarbon economy even though they may heavily depend on cheap inputs of materials from the hydrocarbon economy to make them competitive and/or profitable.

High capital spending on large-scale projects is often a feature of an economy dependent on oil and gas exports. Such spending fosters short-term growth in sectors such as construction and business tourism and has implications for how to understand fluctuations in the non-hydrocarbon economy. If, for example, we take the last eight years of growth in the non-hydrocarbon economies of the Gulf Cooperation Council, it is difficult to assess how much was due to productivity in the non-hydrocarbon sector itself and how much to increased capital spending, higher civil-service wages and subsidies for which increased hydrocarbon revenues during a period of high oil prices allowed.

As mentioned earlier, there is a problem if ‘diversification’ is based on a sector that has been highly subsidized as a result of government protectionism. The ‘infant industry’ arguments imply that unless the infant grows up rapidly and is able to compete in global markets without protection, diversification will be unsustainable. The growth of such industries, as well as the number of jobs they create, can be negatively affected by increasing losses in physical inputs. Thus it is the share of sector output that is globally competitive that provides the critical measure of successful resource-based diversification.

Another approach is to examine the deployment of resource rent to ascertain whether it is depleting the total stock of assets. Environmental domestic product is GDP less consumption of fixed assets and resource depletion. A negative balance would indicate that it is natural-resource consumption, rather than sustainable conversion into other forms of capital, that can maintain economic growth when the natural resource is depleted (World Bank, 2011).

All in all, the non-hydrocarbon deficit measures provide at least a starting point for understanding linkages between the sector and the rest of the economy. They indicate how countries might have done better or when they are heading in the wrong direction.

Why have so many countries failed to diversify away from extractives?

Having identified what might be useful measures of performance or success, it is worth looking at how, and to what extent, the extractive sector can contribute to such measures. One way to seek an answer to that question is through the application and adaption of Albert Hirschman’s idea of linkages from extractive projects to the rest of the economy (Hirschman, 1977).

Linkages to the rest of the economy

Any extractive project generates linkages to the rest of the economy, which can be categorized as fiscal, forward and backward.²⁹ Fiscal linkages refer to the revenue generated for the owner of the resource; in most cases outside the US, this is the state as represented by the government. Forward linkages refer to the supply of the sector output to the rest of the economy, which, in the case of oil and gas projects, implies the supply of oil and natural gas products, though this definition can be expanded to include modern management techniques and managerial capacity to the rest of the economy.³⁰ Backward linkages refer to the inputs into the project from the domestic economy in terms of employment, capital and material inputs into the value chain.

These linkages act as the engine of development. As is explained below, it is a matter for debate whether the public or the private sector promotes them. However, we argue that this is not an either/or issue.

Limitations of the sector's linkages

The implication of Hirschman's analysis as used here is that the linkages of oil, gas and mineral projects are somehow limited and that, for this reason, the sector fails to act as an engine of development.³¹ One argument for that failure is the 'enclave' nature of extractive projects, which can be explained by several factors. The first derives from Hirschman's concept of 'technological strangeness': extractive projects tend to be relatively high-tech and thus require sophisticated and complex equipment and operations.³² If such a project is implemented in a developing environment, it is likely to be isolated from the local economy: there may be neither companies on hand to service the project nor skilled professionals to be employed by it.

Another factor reinforcing the enclave nature of the sector is that the production of crude oil has limited opportunities for value-added industrial use. This is because of the unfavourable economics associated with refining and the downstream segment.

Such limitations are compounded by the fact that the fiscal linkages between extractives and the rest of the economy are 'point revenues', which accrue to the government, rather than taxes from a wide range of revenue-generating activities. Thus only a small number of people decide how those revenues are to be spent and have responsibility for spending them. This is in contrast to peasant agriculture, for example, where the fiscal linkages are highly dispersed among the producers and the spending of revenues generated by the sector depends on a large number of individual decisions and interests.

The push for fast development

To understand why, in the case of most countries, stronger linkages with the rest of the economy have not emerged over time, it is necessary to look at how and at what speed the sector developed as well as at the resources produced.

²⁹ Hirschman also identified a consumption linkage whereby rising income generates higher demand that frequently translates into increased imports as consumption patterns change; this can often destroy established handicraft and artisan activities. Another linkage is to banking: rising incomes lead to higher levels of domestic savings; if a national banking system exists, the income stream is thus redirected in a similar way to that of the fiscal linkage.

³⁰ The classic example of this is Operation Bultiste, which was carried out by Aramco in Saudi Arabia in the 1950s: the company used its expertise and capital to create private-sector companies to service the industry. See Coon (1955).

³¹ Hirschman's original framework pointed to the negative impacts on non-resource sectors and implicitly pointed to sources of alternative potential development.

³² An obvious exception to this would be artisanal mining.

There is a strong tendency among countries that discover resources to develop projects as quickly as possible and aim for rapid depletion of those resources. Pressure to do so comes from two sources: the host government and the operating companies.

Pressure on government to go fast

Announcements of commercial discoveries of oil, gas and/or minerals inevitably raise expectations among the population. This means that governments are immediately under pressure to deploy revenue quickly. At the same time, governments see the inflow of revenue as a means of solving various macroeconomic problems and thus of helping them to be re-elected. And if the country is a kleptocracy, rapid revenue inflows create a pot of money to be raided as quickly as possible.

Companies tend to prefer fast development

The long-held view among extractive companies is that the sooner and faster the resource is produced, the better the project economics will be. The logic behind that view derives from the economics of discounted cash flow associated with any project: the assumption is that, as long as gross inflation is not expected, future revenue will be worth less than present revenue. Thus, other things being equal, early oil will increase the net present value of the project and hence its economic attractiveness.

The role of the shareholders

Key in this context is the role of shareholders and financial markets – not only in setting the cost of capital but in demanding visible near-term returns. Ever since the early 1990s, when the international oil companies adopted a financial strategy based on maximizing shareholder value, they have been under constantly increasing pressure to deliver shareholder value through either higher dividends or higher share prices. This has tended to encourage rapid development of natural resources in a financial market where short-termism has become increasingly dominant, especially since the financial collapse of 2008.³³

At the same time, the infrastructure needs of the oil and gas industry favour large technical economies of scale. Basically, the more that is produced, the lower the cost of production, processing and delivery. In the case of pipelines and storage tanks, for example, the relationship between surface area and capacity is exponential: doubling the size of a tank in effect halves the average cost of storage. This means that pipelines and tanks need to be as large as possible. However, it also means that they need to operate as close to capacity as possible, otherwise the very large fixed costs are spread across a smaller throughput and average costs rise, damaging profitability at an exponential rate. Both higher net present value and the economies of scale associated with infrastructure are the reasons why in the past companies have invariably pushed for rapid development.

In theory, the rapid development model offers advantages in terms of cash with which to solve immediate and urgent problems in an economy – such as poverty reduction, debt financing and energy and transport infrastructure needs. At the same time, it is in harmony with the idea of a ‘one-off’ opportunity for development in a volatile market, especially when there are concerns that the resources may not be worth as much in the future.

³³ This is explored in Stevens, P. (forthcoming), *The Death of the IOC Business Model*, Chatham House Research Paper.

The development agenda

For their part, multilateral financiers and development agencies have been eager to apply their expertise to the extractives-led growth agenda. There has been strong interest in delivering a ‘win-win’ situation in which countries can be brought out of poverty while supplies to the market are increased and financing from large corporates and their governments is secured. This is nothing new in the history of development aid and advice since the 1950s. Each such institution has its own credo, its own rules of engagement and its own manual offering advice. Every time its advice is put into practice, its influence increases.

However, this approach has resulted in an outcome that was not the intention of many of the advisory agencies. In terms of practical policy and economic advice, the extractives-led growth agenda has tended to reinforce domestic, government and investor pressures to ‘develop fast’ and, as a result, become indebted.

The problems

However, developing projects as fast as possible and aiming for a rapid rate of resource depletion poses several problems, especially for developing countries that have limited institutional and regulatory capacity:

- Unless already highly developed, the local private sector may have neither the time nor the means with which to develop the capacity needed to help take advantage of the linkages from natural resource projects. Indeed, it is telling that even Norway – one of the highest-capacity producers and frequently cited as ‘the model’ of good governance – chose to develop its oil sector at a relatively slow rate in order to allow time for the development of backward linkages.
- The time available may be insufficient for the government to develop the institutional capacity required to enforce the regulation of the new sector, which may be strict, or to provide the necessary governance and mechanisms to handle the new revenue flow.
- In the case of oil, coal and gas, rapid increases in supply as a result of rapid development of projects will lead to public pressure encouraging the use of those fuels for domestic energy at prices much lower than their export value and without taxation to mitigate their negative environmental impact. The effect is to lock in both subsidies and trends towards decreasing air quality and increasing emissions.
- The above factors combined with large revenues (relative to the rest of the economy) flowing to government are likely to result in unsustainable spending patterns and many of the ills described in the resource-curse literature. In such a case, the prospect is that the country will become increasingly indebted once export capacity begins to wane.

What Should Countries with Newly Discovered Resources Consider?

Central to the development and aid models that accompanied the now defunct Washington Consensus is the idea that if a model or practice has been proven to work in one developing country, it simply needs to be ‘scaled up’ and deployed in other similar contexts. Increasingly, this approach is seen as not working or even making things worse. According to one recent critique, ‘The repeated “success, scale, fail” experience of the last 20 years of development practice suggests something super boring: Development projects thrive or tank according to the specific dynamics of the place in which they’re applied.’³⁴

The following sections reject that approach and instead discuss key considerations for governments and donors mulling investment in new extractive sectors as the basis for a country’s development.

A national dialogue over the pace of the sector’s development

All countries face the challenge of finding economic pathways towards the sustainable and equitable use of resources, especially given environmental pressures, increasing human demand and climate change. A national dialogue to help guide and inform industrial strategy could be useful.³⁵ The development of an existing or potential resource sector should be part of that dialogue.

Once a country has discovered a potentially significant subsoil resource on its territory it would be sensible to initiate a national dialogue among stakeholders and members of society to discuss how quickly or slowly the resource should be exploited. Indeed, it could be an option not to develop the resource at all and simply leave it in the ground. The classic example of such a debate is that of Norway when North Sea oil was first discovered (Stevens, 2011). Among other benefits, a national dialogue can help manage the expectations inevitably triggered by the announcement of a large extractives find, and if a consensus view on how to develop the resources can be reached, decisions related to depletion are, in effect, removed from the political process. At the very least, such stability could encourage more inward investment in the sector.

The reality is, of course, that not all governments would welcome such a dialogue. At the same time, it is unclear who should lead the debate. An institutional structure like that of stakeholders associated with the EITI is a possibility, especially if such a structure could be created before resource development. But there is no guarantee that a national dialogue would lead to a stable development policy. If the dialogue is lengthy, investment could be inhibited as some companies wait to see what the outcome will be and find that by the time an outcome is reached, the initial conditions to encourage investment are no longer available.

³⁴ Hobbes, M. (2014), ‘Stop trying to save the world: Big ideas are destroying international development’, *New Republic* (available at <http://www.newrepublic.com/article/120178/problem-international-development-and-plan-fix-it>).

³⁵ For example, a 2011 review of industrial policy successes and case studies emphasizes that the development of industrial policy works best when ‘designed as a collaborative process of experimental learning’. See Altenbury (2011).

Just how ‘fast’ or ‘slow’ production should be depends on the state of the economy, the strength of the private sector and the degree of ‘technological strangeness’. Obviously, the greater the disparity between the project and the capabilities of the local economy, the slower the advisable pace of project development; and the same applies if the private sector is weak. In most cases, the government is able to determine directly the pace of development through the regulatory process. As the owner of the subsoil resources, it can decide how many exploration licences are granted; and, in most cases, it approves development plans on an individual basis. Moreover, there often exists legislation whereby the government can directly influence the rate of production. Norway has used licensing policy to delay the development of certain fields. For its part, the UK, which tends to be one of the most *laissez-faire* of countries in this respect, has similar legislation in place allowing the government to set the level of production of each field in the North Sea directly. So far, however, that legislation has never been used.

The case for slow development

For most countries, the rate of developing extractive projects needs to be slowed down if only to allow time for the private sector to develop the capacity and capabilities to take advantage of the forward and backward linkages with the rest of the economy. As noted above in this section, there will inevitably be pressures to produce the oil, gas and/or minerals as rapidly as possible. For this reason, it is necessary to examine how to reduce the rate of depletion.

By biding its time in between stages and waiting until more information is available, a firm will be able to make investment decisions that are more informed and better suited to the economic and political situation that is most likely to prevail throughout the project’s lifetime.

Slowing down the development of a specific project may be problematic if investors are incentivized to maximize its net present value.³⁶ However, according to option theory, a business case for the slow development of a specific project can be made on the grounds that it can add value (Stevens and Considine, 2013). That assertion stems from the proposition that ‘uncertainty creates value’ when a project operator has the real option to develop investment opportunities in stages. By biding its time in between stages and waiting until more information is available, a firm will be able to make investment decisions that are more informed and better suited to the economic and political situation that is most likely to prevail throughout the project’s lifetime.

Indeed, the energy literature has long emphasized the value of using the theory of irreversible investment under uncertainty to quantify the ‘option-like’ characteristics of large-scale energy projects.³⁷

The authors’ informal discussions with industry representatives suggest that some companies do try to take option value into account in their assessment of project economics. However, if there is value in ‘optionality’, is it realistic to assume that the government will allow a company to choose when to employ that option and gain value rather than trying to capture that value for itself?

³⁶ Among other things, this will depend on whether reducing the national depletion rate involves a number of projects and their relative size.

³⁷ See Dixit and Pindyck (1994); Tourinho (1979); Brennan and Schwartz (1985); Dias and Rocha (1999); and Dias (2004).

The case for fast development: treating the sector as a ‘development opportunity’

To use its extractive sector to jump-start growth while allowing enough time for sustainable diversification, a country needs a sufficiently large resource base. As illustrated in Figure 2 above, the rate of transition slows as a country’s resource production increases and then plateaus. To gain investor attention in order to unlock the type of large-scale project that requires, for example, transportation and power infrastructure, a country will need to demonstrate resource potential.

Table 2: Hydrocarbon reserves and production prospects of selected African countries

Country/resource	Proven reserves	Estimated potential	Type of field	Current production	Expected future production
Ghana/oil	0.66 bn barrels	0.37–2 bn barrels	Offshore, depth of 1,100m	2014: 120,000 b/d	2017/8: 250,000 b/d
Ghana/gas	0.80 tcf 1.1 tcf	4–5 tcf	Offshore gas and offshore non-associated gas	–	2017: 200 mcf/d rapid depletion expected post-2020 2018: 180 mcf/d for almost 15 years
Madagascar/heavy oil		1.33–2.45 bn barrels (contingent resources: 1.7 bn barrels)	Onshore	Pilot production only	2018: 8,000–12,000b/d 2022: 50,000–85,000 b/d
Madagascar/gas	0.071 tcf (2012)/ 71.71 tbtu	–	Onshore	–	–
Mozambique/coal		Up to 25 bn short tons	Onshore	12.1 mt/y (2012)	2017: 41.8 mt/y to reach 80 mt/y
Mozambique/gas	100 tcf/ 101000 tbtu	Up to 225 tcf	Offshore and coastal onshore	154 bcf/y (2012)	2019: 200 mcf/d LNG 2023: 30 mt/y by 2022 20 mt/y by 2023 (IMF)
Tanzania/gas	50.5 tcf	Estimated recoverable: 53 tcf	Offshore and coastal onshore	88 bcf/y (2014)	2020 onwards: 50–100 bcf/y
Uganda/oil	2.5 bn barrels	3.5 bn barrels	Onshore and offshore (Lake Albert)	–	2018: 200,000 b/d (47 years)
Uganda/gas	0.5 tcf/ 505 tbtu	–	–	–	Unclear

tcf = trillion cubic feet
mt = million tonnes

Sources: Country ministry data; World Bank; EIA Country reports; Ledesma (2013); various press sources.

As Table 2 shows, some of the new and prospective producers cannot currently lay claim to such potential. For example, at a production rate of 250,000 b/d beginning in 2017, Ghana’s proven oil reserves of 660 million barrels would last barely more than seven years. In Lebanon there has been much excitement over the country’s gas and oil prospects, which the government estimates at 96 tcf of gas and 865 million barrels of oil, respectively. Bank Audi suggested in early 2014 that

those reserves could be worth more than US\$600 billion – a figure that has been widely reported.³⁸ Not only should that estimate be revised downwards in the wake of the 2014 oil price decline; no exploration has begun and the reserve figures are purely speculative.³⁹ If such countries decide to develop their natural resources, they need to consider how to use the sector as a ‘one-off opportunity’ for development.

If the sector were to be used effectively in this way, the revenue stream would need to be channelled into various investments that are deemed sustainable in the long term without creating the kinds of economic distortion highlighted in the resource-curse literature. However, it is doubtful whether this is a realistic option for new small-scale producers that have limited capacity. A fund to manage revenues would almost certainly be necessary. But as already discussed, the prospects of such a fund being effective in such countries are highly uncertain. Thus, recommending the ‘one-off opportunity’ approach to these new producers would not be a viable alternative to slower development of the extractive sector.

The ‘stranded assets’

Any attempts to reduce the rate of depletion are up against another problem. As explained earlier, the prospect of ambitious global action on carbon emissions appears to put a ‘sell-by date’ on fossil fuels. This creates a serious dilemma; whether or not to opt for short to medium term economic progress amid deteriorating longer-term conditions as a result of climate change. Such global action could ultimately encourage governments to pursue the ‘one-off opportunity’ approach – for example by scaling up renewable energy through project investment or earmarked funds that channel resource revenues to support low carbon growth. There is a significant difference between governments spending to incentivize an undesirable trend in consumption and increasing the need for more subsidies, on the one hand, and governments spending to correct ‘market failures’ and enable a positive outcome that will reduce the need for state support over time, on the other. Put another way, the switch from ‘perverse’ to ‘learning’ subsidies – or introducing ways to put a price on environmental impact (‘internalize externalities’) – is to be commended.

Capacity for handling a ‘one-off opportunity’ approach

Those countries for which the strongest rationale to go fast exists – namely, relatively small reserves compared with the size of the population – are often those with the least capacity to insulate the rest of the economy from the effects of resource-sector development and handle spending windfalls.

The key to enabling the extractive sector to act as a ‘leading development sector’ is to promote diversification away from extractives as soon as the first commercial discovery has been declared. This requires some form of development or industrial policy to promote the private sector and ensure that linkages from the extractive sector make the maximum contribution to long-term and sustainable diversification.⁴⁰

In an ideal world – one in which where there were no market failures and the private sector was both active and effective – government policy would not be needed. It could simply be left to the private sector operating in the market and using its ‘invisible hand’. However, market failures are endemic in all economies, and developing countries are riddled with them. If the private sector is weak and ineffective,

³⁸ ‘Audi: Lebanon oil wealth could exceed \$600B’, *Lebanon Daily Star*, 13 February 2014.

³⁹ See <http://www.mesp.me/2014/12/11/lebanons-oil-gas-reality-check/>.

⁴⁰ The use of the term ‘industrial policy’ in this context should not be taken as an indication that industry is the only option for diversification. That process could be based on the agricultural or service sectors.

policy and legislation may be needed to encourage capacity-building. Moreover, as the experience of energy-exporting countries with high carbon intensity shows, the switch to resource-efficient, climate-sensitive economic performance will be severely inhibited without a plan for transition (Bailey and Preston, 2014).

It is important to find ways to reorient spending and incentives to avoid increasing the need for government support and encouraging more rent-seeking.

The extent and nature of government intervention depend on the state of the private sector, the level of 'technological strangeness' between the extractive project and the rest of the economy, and the degree of market failure. As one recent study argues, industrial policy is essential to pave the way for a country's transition towards ever-decreasing emissions and other types of environmental pollution (Bailey and Preston, 2014). But it is important to find ways to reorient spending and incentives to avoid increasing the need for government support and encouraging more rent-seeking.

While this is a challenge for all countries, those dependent on extractive exports will face various policy choices. With regard to economic sustainability, they will have to decide whether to facilitate the extraction of resources, which will require approving environmental regulation and taxation affecting the sector, setting energy prices and other sectoral subsidies, as well as planning and coordinating new infrastructure, including utilities, electric grid, roads and urban development. Other decisions to be made will include how to channel revenues for economic diversification and whether the sector can engage in developing skills for other sectors necessary for sustainable transition.

The need to improve the coordination and planning of infrastructure

There is general agreement in the development literature that basic infrastructure – ranging from transport and power to water, sewage systems and telecommunications – is a prerequisite for development and, moreover, for any economy to function.

This is especially relevant in the early stages of development, when the provision of infrastructure generates its own linkages within the domestic economy. An example often quoted in the literature is the development of the rail network in the US in the nineteenth century. However, given the changing context and concerns outlined above, there is an overarching consideration about the sustainability of both the project-related and national infrastructure that is expected to be built as foreign investment and revenues begin to flow.

In cases where a number of projects are being implemented at the same time – which is quite common when a particular basin begins to be developed – each individual operator will consider the infrastructure needs only of its project. Those needs are likely to include roads, electricity, water and ICT as well as housing and services for employees. In order to ensure efficiency and economies of scale, project-related infrastructure should be coordinated with national development plans and the current requirements of the local community. A good recent illustrative example is LNG plant construction in Australia. Currently, 13 LNG plants are being constructed in the world, seven of which are in Australia, and three of these plants are located very close to one another. There has been no attempt to ensure coordination even in what is a relatively sophisticated country. Among other impacts, this has led to serious project cost inflation and significant slippage in the timing of project completion.

Frequently, connectivity to local and regional markets is a prerequisite for broad-based and inclusive growth. But often the infrastructure associated with extractive projects is highly specific and brings few benefits for local communities. Indeed, such projects tend to be enclaves. However, there are cases where extractive projects open up the communities to wider geographical areas through the provision of dual-use transport links or support broader economic development by providing power for local communities.⁴¹

If project plans for infrastructure are coordinated with local or regional ones, a sound base for overall development can be created and the extractive sector will become a 'leading development sector'. However, there are cases where such plans appear to be out of sync. For example, it is questionable to what extent countries such as Mozambique and Tanzania should prioritize LNG exports when there is an urgent need for power and industry at both the national and the regional level.

In each case, questions must be asked about infrastructure needs and how to ensure complementarity over the long term and under changing environmental and technological conditions. For example, what impact will new infrastructure have on land use? How much water and energy will it require? Will it be resilient to the effects of climate change, including increased temperatures and flooding? And, not least, can the development of new below-ground resources complement a country's low-carbon or climate-sensitive development plan? This last question highlights an issue that is under-researched and should be urgently addressed.

⁴¹ See, for example, the World Bank's 'The Power of the Mine' initiative at <http://www.worldbank.org/en/news/video/2015/02/09/the-power-of-the-mine>.

Conclusions and Questions for Further Investigation

Over the last decade, an extractives-led growth agenda has prevailed among multilaterals, consultancies and some development agencies. The assumption has been that efforts to better manage the extractive sector will be sufficient for it to spearhead positive development outcomes. As a result, countries have been encouraged to use oil, gas or minerals deposits as a basis for development – a policy that continues to influence the investment choices those countries make and the governance advice they receive.

Rapid growth and large-scale investment in several East and Southeast Asian, sub-Saharan African and Latin American countries would seem to reinforce the view that below-ground resource wealth can be good for the economy. This paper has asked if those developments mean that the alleged ‘curse of natural resources’ – for which so many academics found evidence in previous decades – has now been laid to rest. Has the international focus on revenue management and good governance helped overcome the negative effects of dependence on revenue from extractives? And, if not, should countries, donors and development advisers rethink the basis for their actions and advice, especially in view of potentially fundamental changes in the global context for investment risk?

Understanding extractives-led growth in its historical context

The extractives-led growth agenda must be understood in its historical context. Though undoubtedly influenced by criticism of the resource-curse literature, it was born out of a surge of investment in extractives in more challenging regions amid the high (and generally rising) commodity prices of the 2000s as well as the increase in Asian investment strategies focused on foreign resources. Those conditions generated strong interest among governments, companies and international institutions to tell a positive story about what resources could do for the economy as a whole.

The extractives-led growth agenda does not signify the absence of genuine good will. If natural resources were to be developed (by either international or state-owned national companies) irrespective of concerns about the resource curse, so the argument went, development assistance and guidance should focus on ensuring good governance so that the country that owns those resources gains the maximum benefit from their development. That remains a justifiable position.

Has the extractives-led growth agenda delivered?

In terms of practical policy and economic advice, the extractives-led growth agenda has tended to reinforce domestic, government and investor pressures to ‘develop fast’. At the same time, it has underpinned the emergence of several global initiatives to enhance transparency, local capacity-building, environmental best practice and human rights in and around the sector.

This ‘fast-track’ approach by donors and international advisers may well have been inevitable, given the obvious benefits of foreign-investment inflows and export revenues for countries suffering from poverty, lack of infrastructure and high levels of indebtedness. However, the extractives-led growth

agenda is in urgent need of re-evaluation. It is unclear whether the policy advice stemming from that agenda can serve as an antidote to the negative effects observed in the resource-curse literature.

For its part, this paper has argued that the governance challenges for new, low-capacity producers remain immense. The current downturn in commodity prices is proving challenging to exporters, many of whom benefited financially during the previous decade of high prices. At the same time, reliance on the sale of high-carbon fuels is being challenged by the prospective global shift to lower-carbon technologies and energy efficiency.

Moreover, the extractives-led growth agenda has been promoted largely in a generalized way; as a result, the varied and complex circumstances of individual countries and their resource base has been overlooked. This paper has identified several serious problems with the extractives-led growth agenda, including:

- **Loss of the underlying context for extractives-led growth:** We no longer live in a world of high and rising commodity prices, and the slump in many extractive prices has already led companies to withdraw investment from 'higher-risk' projects, while the oil price decline is likely to discourage major investment in countries with little infrastructure. Moreover, financial markets have changed significantly following the financial crisis of 2008: financial investors have lost their appetite for large, long-term, high-risk projects.⁴²
- **Ignoring the heterogeneity of existing and prospective producers ...:** Getting governance right to manage the sector effectively will be much harder and more expensive for many poorer countries.
- **... and the size of the resource base:** This factor is fundamental to deciding whether and to what extent a country can depend on resources serving as a driver of growth. Several of the new producers identified in this paper appear to lack sufficiently large reserves.⁴³
- **Overlooking other (potential) choices:** Such choices include leaving resources in the ground or developing them more slowly than investors would like.
- **Insufficient attention to the risk of putting 'all one's eggs into one basket' ...:** This risk is particularly acute as the rest of the world may move away from some extractives. The problem of stranded assets – or, at least, declining terms of trade in a carbon-constrained world – remains a threat to wealth creation from hydrocarbons owing to the length of time from discovery to production.
- **... and to the danger of locking in high-carbon infrastructure, practices and interests:** Low-carbon or climate-smart transition would be more difficult and more expensive if this danger is not averted.

⁴² See Stevens, P. (forthcoming), *The Death of the IOC Business Model*, Chatham House Research Paper.

⁴³ This does not necessarily mean that the resources should be large relative to the rest of the economy. It could be argued, for example, that any competitive diversification of the economy has more chance of succeeding if the resource base is modest, since Dutch disease and the 'crowding out' phenomenon can be more easily avoided.

Can the extractives-led development agenda deliver and if so, what must it do to be considered successful?

Asking what constitutes successful development in the cases of countries with extractive sectors is a useful way of circumventing the biases stemming from the resource-curse theory and the extractives-led growth agenda.

Clearly, diversification of the economy away from the resource sector over an appropriate timeframe is key. Though an imperfect means of measurement, the non-hydrocarbon fiscal and current account deficits can be taken to calculate dependence on the sector along with other factors such as the level of direct and indirect subsidies and the amount of direct publicly funded investment the various sectors receive. On the basis of such figures, it can be determined if such subsidies and investment are diminishing over time as growth in those sectors becomes more self-sustaining.

Then there is the question of what contribution the sector can make to diversification. Creating backward and forward linkages with the rest of the economy and ‘reshuffling assets’ are two concepts in the literature that remain salient for today’s resource-holders. On the basis of those concepts, extractive revenues should not be viewed as income to be consumed. Rather, they are to be seen as representing a reshuffling of the national portfolio of assets. Converting extractive resources below ground into money above ground raises key questions about how the money can be deployed to create productive assets for the future. A major area for further study is how economies diversify, what the barriers to diversification are and what policy options might be employed to lower those barriers.

These concepts suggest that more economic and governance capacity needs to be in place *before* investment begins in the extractive project in order that investment and the eventual revenues from it generate real benefits to the rest of the economy and, ultimately, sustainable diversification in line with the lifetime and marketability of the resource.

There are six main questions that countries, donors and prospective advisers should address:

1. Are the necessary resources available for long-term growth? If not, how long can they be expected to last and what are the depletion timeframe options and what contribution is the sector likely to make to development during its lifetime?
2. How will a country with natural resources deal with a downturn in prices? Will society and the country’s leadership be prepared for a slump? If there are significant threats to stability, is it worth raising expectations about development?
3. What is the plan for strengthening the rest of the economy, reducing reliance on extractive export revenues and cutting back on the subsidized use of coal, oil and gas as inputs to industry? This is a long-term strategic question that should be addressed in earnest as soon as resources have been discovered. The plan must be adapted to take into account the expected depletion timeframe as well as human and other country potentials.⁴⁴ This leads to the key question of how to build linkages from the extractive to the non-extractive sectors of the economy.
4. Following on from the above, what are the potential scenarios for long-term demand, bearing in mind the global shift to lower-carbon economic systems? The various scenarios differ depending on the resource. How they play out leads to the question of how much

⁴⁴ Of course this raises the very important question of how to make a coherent plan if the size of the resource base is highly uncertain – which with new areas is often the case.

sustainable employment can be generated from extractive projects and how to tackle retraining, particularly in the case of the mining industry, which employs a larger (often more politically significant) number of nationals.

5. Are there enough robust institutions to manage the new sector well and, if not, are there options of delaying or slowing down development? These are valid options for several of the countries discussed above, given the enormity of the governance and political stability challenges they face. In certain cases, it may be better not to produce the resource at all until conditions improve. Bad governance will probably be made much worse by the availability of resource revenues.
6. Are extractives-led growth agendas compatible with low-carbon or climate-smart development? This is an important consideration from a political perspective given the stated interest of many donor countries in promoting low-carbon development, and the growing enthusiasm for cleaner technologies by civil society in those countries that already face environmental degradation and will be hardest hit by climate change. There is little understanding to date of whether and/or how the various extractive-sector activities can make a significant contribution to the low-carbon economy through their investments and operations.

Acknowledgments

The authors would like to thank the following peer reviewers of this research paper: Ali Aissaoui, Rick Auty, Rob Bailey, Evelyn Dietsche, Mark Finley, Valérie Marcel, John Mitchell and Siân Bradley. Any errors are the responsibility of the authors alone. We would also like to thank Owen Grafham, Jan Cleave and Margaret May for editorial assistance.

About the Authors

Paul Stevens is a distinguished fellow in the Energy, Environment and Resources department at Chatham House. He is also professor emeritus at the University of Dundee and a visiting professor at University College London. Professor Stevens has published extensively on energy economics, the international petroleum industry, economic development issues and the political economy of the Gulf. He also works as a consultant for many companies and governments. He received the 2009 OPEC Award in recognition of his outstanding work in the field of oil and energy research for his services to petroleum research.

Glada Lahn is a senior research fellow in the Energy, Environment and Resources department at Chatham House. She specializes in resource governance, development and sustainability issues in oil- and gas-exporting countries. She currently leads the 'Valuing Vital Resources' project on the use of costs and market incentives for sustainability in energy, water and food. She also leads the department's work on extractives-led growth and low-carbon development.

Jaakko Kooroshy was a research fellow in the Energy, Environment and Resources department at Chatham House between 2011 and 2014. He specialized in the political economy of natural resources and global commodity markets, and led the department's work in mining and metals.

References

- Adams, P. (2015), 'Africa Debt Rising', Africa Research Institute. <http://www.africaresearchinstitute.org/publications/africa-debt-rising-2/>.
- Africa Progress Panel (2013), 'Equity in Extractives: Stewarding Africa's natural resources for all'. http://www.africaprogresspanel.org/wp-content/uploads/2013/08/2013_APR_Equity_in_Extractives_25062013_ENG_HR.pdf.
- Altenbury, T. (2011), 'Industrial Policy in Developing Countries: Overview and lessons from seven country cases', Discussion Paper 4/2011, German Development Institute. http://www.die-gdi.de/uploads/media/DP_4.2011.pdf.
- Auty, R. (ed.) (2001), *Resource Abundance and Economic Development* (Oxford: Oxford University Press).
- Bailey, R. and Preston, F. (2014), 'Stuck in Transition: Managing the Political Economy of Low-carbon Development', Chatham House Research Paper.
- Bailey, R., Bradley, S., Brown, O. and Ford, J. (2015), 'Investing in Stability: Can Extractive-sector Development Help Build Peace?', Chatham House Research Paper.
- Beblawi, H. and Luciani, G. (eds) (1987), *The Rentier State* (London: Croom Helm).
- Brennan, M. and Schwartz, E. (1985), 'Evaluating Natural Resources Investments', *Journal of Business*, 58: 135–57.
- Calder, J. (2014), 'Administering Fiscal Regimes for Extractive Industries: A Handbook', IMF and World Bank. <http://eduart0.tripod.com/sitebuildercontent/sitebuilderfiles/AdministeringFiscalRegimesForEI.pdf>.
- Carbon Tracker Initiative (2014), 'Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?' <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>.
- Collier, P. and Hoeffler, A. (2004), 'Greed and Grievance in Civil War', *Oxford Economic Papers*, 56: 563–95.
- Coon, C. S. (1955), *Operation Bultiste: Promoting Industrial Development in Saudi Arabia* (Leiden: A.W. Sijthoff's Uitgeversmij).
- Corden, W. M. and Neary, J. P. (1982), 'Booming sector and Dutch disease economics: A survey', *The Economic Journal*, 92: 285–99.
- Darby, S. (2010), 'Natural Resource Governance: New frontiers in transparency and accountability'. http://www.transparency-initiative.org/wp-content/uploads/2011/05/natural_resources_final1.pdf.
- Dias, M. A. G. (2004), 'Valuation of Exploration and Production Assets: An Overview of Real Options Models', *Journal of Petroleum Science and Engineering*, 44(1–2): 93–114.
- Dias, M. A. G. and Rocha, K. (1999), 'Petroleum Concessions with Extendible Options: Investment Timing and Value Using Mean Reversion and Jump Processes for Oil Prices', Institute for Applied Economic Research Working Paper 620. <http://dx.doi.org/10.2139/ssrn.159692>.

- Dietsche, E. (2014), ‘“Good Governance” of the Extractive Resources Sector: A Critical Analysis’, PhD thesis, University of Dundee, Scotland.
- Dixit, A. K. and Pindyck, R. S. (1994), *Investment under Uncertainty* (Princeton, NJ: Princeton University Press).
- Dobbs et al. (2013), ‘Reverse the Curse: Maximizing the potential of resource-driven economies’, McKinsey Global Institute. http://www.mckinsey.com/insights/energy_resources_materials/reverse_the_curse_maximizing_the_potential_of_resource_driven_economies.
- Easterly, W. R. (2002), *The Elusive Quest for Growth: Economists’ Adventures and Misadventures in the Tropics* (Cambridge, MA: MIT Press).
- Heuty, A. (2009), ‘Five Recommendations for Managing Natural Resource Revenue in Times of Crisis’, Revenue Watch Institute.
- Hirschman, A. O. (1977), ‘A generalized linkage approach to development, with special reference to staples’, *Economic Development and Cultural Change*, 25 (supplement: 67–98).
- IMF (2007), ‘The role of fiscal institutions in managing the oil revenue boom’. <http://www.imf.org/external/np/pp/2007/eng/030507.pdf>.
- Karl, T. L. (1997), *The Paradox of Plenty: Oil Booms and Petro-States* (Berkeley, CA: University of California Press).
- Keblusek, M. E. (2010), ‘Is EITI really helping improve global good governance? Examining the Resource Curse, Corruption, and Nigeria’s EITI Implementation Experience’. <http://nidprodev.org/EITI%20-%20Nigeria%20Analysis.pdf>.
- Kretzman, S. and Nooruddin, I. (2011), ‘Drilling into Debt: An Investigation into the Relationship Between Debt and Oil’. <http://priceofoil.org/content/uploads/2011/01/DrillingIntoDebt.pdf>.
- Kuhn, T. S. (1996), *The Structure of Scientific Revolutions*, 3rd edn. (Chicago, IL: University of Chicago Press).
- Lederman, D. (2013), ‘East Africa Gas: The Potential for Export’, Oxford Institute of Energy Studies. <https://www.oxfordenergy.org/2013/03/east-africa-gas-the-potential-for-export/>.
- Luciani, G. (2011), ‘Price and revenue volatility: What policy options and role for the state?’, *Global Governance*, 17(2): 213–28.
- Lujala, P. and Rustad S. A. (eds) (2012), *High-Value Natural Resources and Post-Conflict Peacebuilding*, United Nations Environment Programme.
- Maloney, W. F. (2002), ‘Innovation and growth in resource-rich countries’, Central Bank of Chile Working Paper 148.
- Marcel, V. (ed.) (2013), *Guidelines for Good Governance in Emerging Oil and Gas Producers* (London: Chatham House).
- McGlade, C. and Ekins, P. (2015), ‘The geographical distribution of fossil fuels unused when limiting global warming to 2 degrees C’, *Nature*, 517: 187–90.
- Mitchell, J. and Stevens, P. (2008), *Ending Dependence: Hard Choices for Oil-Exporting States* (London: Chatham House).

- Mkandawire, T. (2001), 'Thinking about developmental states in Africa', *Cambridge Journal of Economics*, 25(3), 289–314.
- Natural Resource Governance Institute (NRGI) (2014), *Natural Resource Charter*, 2nd ed. http://www.resourcegovernance.org/sites/default/files/NRCJ1193_natural_resource_charter_19.6.14.pdf.
- Oweiss, I. (1974), 'Petrodollars: Problems and prospects', address to the conference on the World Monetary Crisis at Arden House, Harriman Campus, Columbia University, 1–3 March. <http://faculty.georgetown.edu/imo3/petrod/petro2.htm>.
- Perroux, F. (1983), *A New Concept of Development* (London: Routledge).
- Preston, F. (2012), *A Global Redesign? Shaping the Circular Economy*, Chatham House Briefing Paper.
- Ross, M. (2012), *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations* (Princeton and Oxford: Princeton University Press).
- Rostow, W. W. (1963), *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge, UK: Cambridge University Press).
- Sachs, J. D. and Warner, A. M. (1997), *Natural-resource Abundance and Economic Growth* (Cambridge, MA: Center for International Development and Harvard Institute for International Development, Harvard University).
- Stevens, P. (2003a), 'Resource impact: Curse or blessing? A literature survey', *Journal of Energy Literature*, 9(1): 3–42.
- Stevens, P. (2003b), 'National Oil Companies: Good or Bad? – A Literature Survey', paper presented to the National Oil Companies Workshop on 'Current Roles and Future Prospects', World Bank, Washington, DC.
- Stevens, P. (2011), 'Contractual arrangements and revenue management: The UK/Scotland and Norwegian experience', *Global Governance*, 17(2): 149–53.
- Stevens, P. and Considine, J. (2013), 'The Economic Case for the Staged Development of Extractive Industry Projects in the Presence of Potential "Resource Curse"', *Energy Politics*, Fall.
- Stevens, P., Kooroshy, J., Lahn, G. and Lee, B. (2013), *Conflict and Coexistence in the Extractive Industries* (London: Chatham House).
- Stevens, P. and Mitchell, J. V. (2008), *Resource Depletion, Dependence and Development: Can Theory Help?*, Chatham House Programme Paper.
- Tourinho, O. (1979). 'The Option Value of Reserves of Natural Resources', PhD thesis, University of California, Berkeley.
- Van der Ploeg, F. (2011), 'Natural resources: Curse or blessing?', *Journal of Economic Literature*, 49(2): 366–420.
- Van der Ploeg, F. and Poelhekke, S. (2010), 'The pungent smell of "red herrings": Sub-soil assets, rents, volatility and the resource curse', *Journal of Environmental Economics and Management*, 60(1): 44–55.
- World Bank (2011), *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium* (Washington, DC: International Bank for Reconstruction and Development/World Bank).

Independent thinking since 1920

Chatham House, the Royal Institute of International Affairs, is an independent policy institute based in London. Our mission is to help build a sustainably secure, prosperous and just world.

Chatham House does not express opinions of its own. The opinions expressed in this publication are the responsibility of the author(s).

© The Royal Institute of International Affairs, 2015

Cover image © Randy Olson/Getty Images

ISBN 978 1 78413 010 7

This publication is printed on recycled paper.

The Royal Institute of International Affairs
Chatham House
10 St James's Square, London SW1Y 4LE
T +44 (0)20 7957 5700 F +44 (0)20 7957 5710
contact@chathamhouse.org www.chathamhouse.org

Charity Registration Number: 208223