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Extractive industries and development

Lessons from international experience for Mozambique

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Abstract: In common with several other low-income African economies, in recent years Mozambique has seen a significant expansion of interest and investment in its long-established extractives industries. Huge new gas finds in particular have led to expectations that these industries will contribute very significantly to the country's future economic development and structural change. However, the policy challenges associated with capturing the benefits of extractives activity and avoiding the well-documented downsides are numerous, and they embrace a wide range of areas of government policy, including macroeconomic, fiscal sectoral, environmental, and community aspects. This paper examines a wide range of these policy areas, and it attempts to summarize what we know from international experience about different policy approaches and some aspects of good practice as well as pitfalls. The paper is not intended as a set of policy prescriptions for Mozambique, but rather as a mapping of approaches in a wide set of relevant and interconnected policy areas, all of which will need careful consideration by the authorities in the months and years ahead.

Keywords: Extractive industries, resource curse, policy coordination, institutional change, economic diversification, economic transformation

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1 Introduction

1.1 Objectives, outline, and Mozambique's situation

In common with several other low-income African economies, in recent years Mozambique has seen a significant expansion of interest and investment in its long-established extractives industries—not only in metals and minerals, where it has long had a presence,[1] but also in coal, and more recently in natural gas, a resource that has prospects of becoming Mozambique's largest single export product. Although the extractives sector still accounts for a relatively small proportion (less than three per cent) of gross domestic product (GDP), its statistical importance in relation to other key macro variables such as exports and government revenue is large and, as evidenced in Section 1.2 of this paper, is also rising over time. It is therefore of central importance to better understand the role that this expanding sector might potentially play in the future economic development of the country, and the sorts of issues and policies that need to be addressed to ensure that such a role is a positive one, avoiding the worst features of the so-called resource curse.[2]

This paper offers a contribution in this area by synthesizing a wide range of lessons that are available from documented international experience and the guidance these may offer in the Mozambican context. The paper does not presume to provide specific policy recommendations for Mozambique. However, it does identify a set of policy challenges, the types of approach that other countries have used in addressing these challenges, and the various successes and failures that have arisen. It is hoped that this analysis will provide the basis for a productive discussion in-country about the types of policy choices that Mozambique might make as the economic and fiscal role of the nation's extracted resources increases in the future.

The paper begins in Section 1.2 below with a brief statistical mapping of the present level of Mozambique's dependence on various extractive industries, how this has evolved over the past two decades, and the possible scale of its further evolution over the next 25 years. Section 2 examines policy choices in macroeconomic and fiscal management, beginning in Section 2.1 with thoughts on the current situation in Mozambique. Section 2.2 examines some general lessons in macro and fiscal management, with the following two sections then drilling down into some specific details that underlie this area of macro/fiscal policy. Specifically, Section 2.3 examines the macro and fiscal implications of national oil companies (NOCs), and Section 2.4 discusses guidelines for appropriate tax regimes for the sector. An accompanying text box looks at some issues associated with the possible roles of a sovereign wealth fund (SWF). Section 3 then moves the discussion onto the various possible roles of extractives industries as a catalyst for a country's broader structural transformation. Section 3.1 addresses the question of why an eventual structural transformation should be the central focus of extractives policies. Section 3.2 discusses local content/backward linkages and the policies to stimulate these. Section 3.3 provides a similar deeper examination of downstream activities/forward linkages linked to the main primary extracted resources. Section 3.4 examines the related opportunities made available by the sharing

[1] The extractive resources involved are very diverse. They include ilmenite, zircon, aluminium, tantalum, cement, clays, coal, diatomite, gemstones (such as aquamarine, dumortierite, garnet, ruby, and tourmaline), gold, refined lead, natural gas, natural gas condensate, niobium (columbium), quartz, rutile, and salt.

[2] The extensive literature on the resource curse has been very widely reviewed in other places, and so does not need to be much discussed here. One recent and detailed review can be found in Stevens (2015).

of infrastructure. Finally, Section 4 examines areas of policy that connect to the local and community aspects of extractive activity. Specifically, Section 4.1 considers the types of voluntary policy approach that have been applied in other countries to foster positive community benefits from extractives and to minimize the negative impacts. Section 4.2 examines the growing trend for legislated/mandated approaches to this same question. The paper ends by concluding that Mozambique's extractive industries provide considerable scope for achieving national development goals, but require careful management and appropriate policy.

Some specific Mozambican issues and experiences in these various areas of policy are inserted at various places in the text, mainly using text boxes. But it should be emphasized once more that the paper is not primarily seen as a detailed set of policy recommendations for Mozambique, but rather as a trigger for informed discussion.

1.2 Increasing dependence

A recent paper by Roe and Dodd (2017) examined the statistical dependence of low- and middle-income countries (LICs and MICs) on both types of extractive resource (metals, and oil and gas), and assessed how country levels of dependence had changed in the 20 years since 1996. It showed a clear upward trend in dependence in many LICs, a tendency that was only slightly dented by the commodity price collapse after 2011–12. The paper's approach first identified 67 LICs and MICs that had an export share for minerals plus oil and gas of more than 30 per cent of total exports[3] (according to UNCATD trade data for 2014). It then compared that same share for the years 1996, 2012, and 2014. The results for the 18 LICs are shown (in alphabetical order) in Table 1. Mozambique followed a general pattern: a very large increase in its percentage dependence on extractives (in terms of exports) between 1996 and 2012 (from six per cent to 36 per cent for metals, and from eight per cent to 72 per cent when metals, coal, and oil and gas are all considered). The overall level of export dependence declined very slightly between 2012 and 2014 as commodity prices generally fell, but that decline did not apply to minerals that continued to increase in importance. By 2014 the levels of export dependence were far higher than had been the case two decades previously. In terms of government revenue, International Monetary Fund (IMF) data (reported in ICMM 2016) show that the extractive sectors contributed an annual average of about six per cent to total government revenues in the period 2000–13. However, this contribution is also on a rising time trend.

The future, as always, is uncertain, but for the past several years there has been a strong expectation in Mozambique that this high level of extractives dependence will be sustained and will most likely increase significantly in future years if the known plans, especially for liquefied natural gas (LNG) production and new coal investments, are realized.

That proposition received an enormous boost once data began to emerge that revealed the potentially huge magnitudes of Mozambique's future benefits, especially from its gas/LNG resources. Box 1 summarizes the nature of the discoveries associated with this development, especially in the Rovuma valley.

[3] Of these, 18 countries were identified as LICs and 25 as low-middle-income countries according to the World Bank classification.

Table 1: LIC dependence on EI exports, 1996–2014

	Income	Country	Minerals as % of total			Minerals incl. coal and oil & gas as % of total		
			1996	2012	2014	1996	2012	2014
1	*Low*	*Benin*	*1%*	*21%*	*12%*	*5%*	*37%*	*26%*
2	Low	Burkina Faso	8%	46%	50%	23%	46%	57%
3	Low	Central African Republic	56%	44%	45%	56%	45%	46%
4	Low	Chad	0%	0%	0%	0%	94%	94%
5	Low	Dem. Rep. of the Congo	72%	81%	78%	83%	92%	93%
6	Low	Eritrea	62%	61%	36%	63%	61%	36%
7	Low	Guinea	76%	60%	53%	81%	87%	92%
8	Low	Korea, Dem. People's Rep.	9%	16%	15%	11%	56%	50%
9	Low	Liberia	49%	24%	43%	50%	41%	44%
10	Low	Madagascar	8%	18%	34%	11%	20%	36%
11	Low	Mali	8%	42%	47%	10%	43%	50%
12	**Low**	**Mozambique**	**6%**	**36%**	**42%**	**8%**	**72%**	**68%**
13	Low	Niger	21%	22%	21%	40%	57%	57%
14	Low	Rwanda	3%	39%	45%	3%	47%	55%
15	Low	Sierra Leone	28%	51%	46%	29%	51%	46%
16	Low	Togo	33%	28%	18%	40%	43%	34%
17	Low	United Republic of Tanzania	4%	35%	33%	4%	37%	34%
18	Low	Zimbabwe	15%	27%	19%	17%	38%	31%

Source: Roe and Dodd (2017).

Box 1: Mozambique's offshore gas fields for LNG/floating LNG for international export: a summary

The huge Rovuma fields in the north-east of Mozambique were discovered only in 2010–11, and so the specific plans to develop these are still in process. The Rovuma fields are divided into two concession areas, both granted in 2007: Area 1 (lead concessionaire: Anadarko) and Area 4 (lead concessionaire: ENI, but with a stake also by ExxonMobil).[4] Their total investment costs, estimated at around US$100 billion, would make it the largest investment project in sub-Saharan Africa. Smaller discoveries in the 1990s, mainly in the southern Pande-Temane fields, had earlier opened the way to Mozambique's gas production. Other fields have later discovery dates. Initially it was thought that the discovery of over 180 trillion cubic feet (tcf) of natural gas reserves (equivalent to the entire gas reserves of Nigeria, according to IMF 2016) by Texas-based Anadarko and ENI (Italy)—easily the largest discoveries to date—could turn Mozambique into a major exporter by 2023, but various delays have caused this dating to be revised. The situation as we understand it today is as follows:

- Anadarko plan to build an LNG plant to process the gas they have discovered in Area 1 of Rovuma, off the northern coast of Mozambique near the border with Tanzania. Anadarko submitted the LNG Plan of Development to the government in January 2017, and a final investment decision was thought to be possible by end 2017. The Area 1 consortium initially plans to construct two onshore liquefaction trains, each of which will produce about 5.5 million tons of LNG per annum.
- ENI has commissioned a floating LNG (FLNG) facility for its Coral South Project, due for completion in 2022 and expected to produce 5 million tcf in its first phase alone.[5] Its board approved the investment plan for this in late 2016. The British energy major BP has been identified as a major purchaser of the LNG output for a period of 20 years. It is understood that ENI is leading the Coral South FLNG project and the upstream operations, and ExxonMobil—a 25 per cent partner in Area 4—will lead the construction and operation of liquefaction facilities onshore.
- Total (France) has concluded its Production Sharing Agreement (PSA) with government and was expected to initiate exploration activities in the second half of 2017 in Areas 3 and 6.
- Statoil and Petronas have been drilling in Areas 2 and 5 and 3 and 6 respectively of the Rovuma basin. If successful, they may develop gas fields in the south of Palma, which is somewhat closer to the more developed areas of the country.

The IMF was quick to build a model (based on its 'fiscal analysis of resource issues' modelling approach) that was then used to project the possible future levels of production, exports, and government revenues from just the Rovuma fields. The results were published in IMF (2016), and they showed in brief the following:

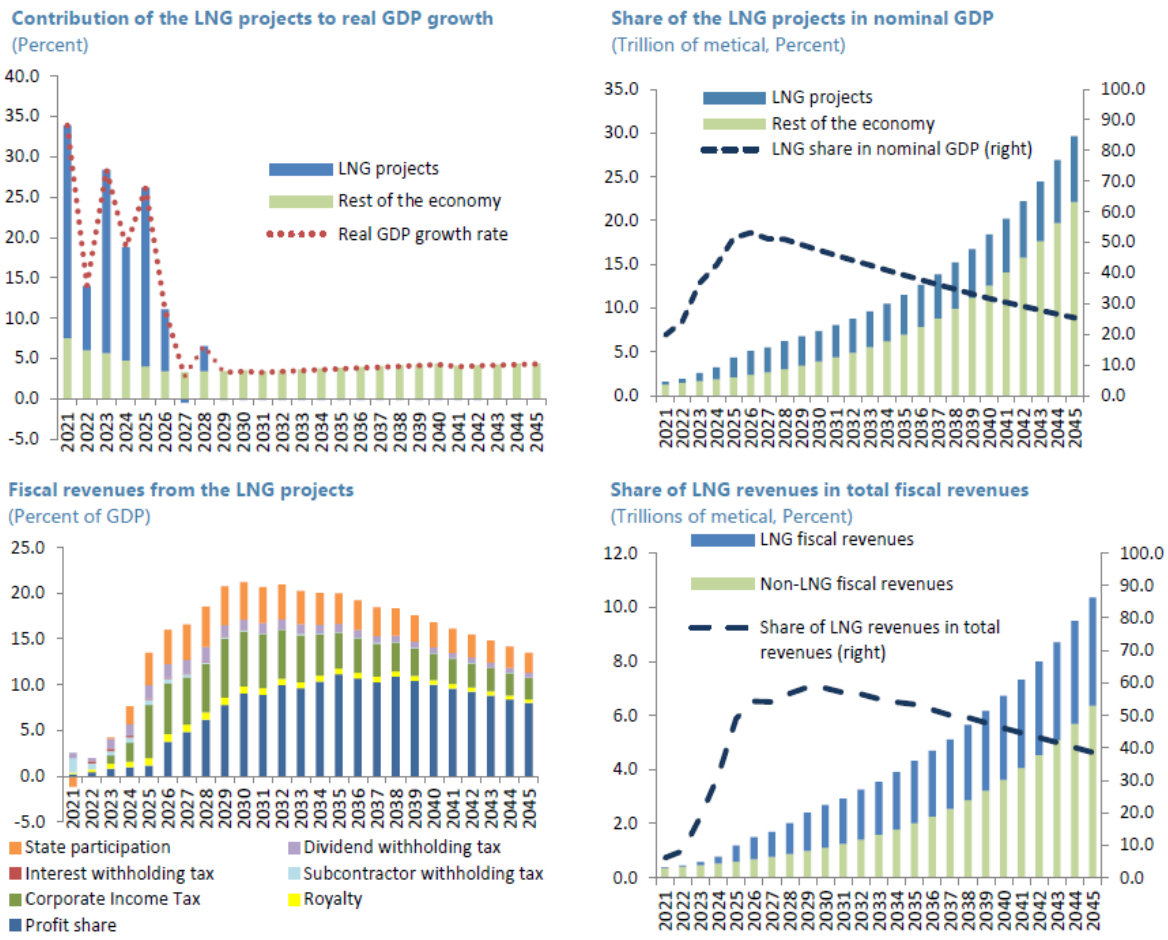
- Assuming a start to LNG production in 2021, the two main operators could eventually construct a total of 13 onshore LNG trains and four FLNG trains for the gas project. The total production volume of the LNG could thereby reach 89 million tons per annum by 2028.
- The average annual growth rate of real GDP between 2021 and 2025 could reach 24 per cent, and the share of the LNG projects in total nominal output of Mozambique could exceed 50 per cent by the mid-2020s.
- The total fiscal revenues from the LNG projects throughout the entire project period until 2045 could reach about US$500 billion. By the late 2020s, the fiscal revenues from the gas projects could account for more than 50 per cent of total fiscal revenues

[4] Anadarko's concession area includes locations referred to as Windjammer, Barquentine, Lagosta, Tubarão, Camarão, Golfinho, and Atum, while those of ENI include locations referred to as Mamba and Coral.

[5] Total reserves are estimated at 15 tcf.

These and other, more detailed numbers from the IMF projections as published in January 2016 are shown in Box 2.

Box 2: Selected numbers from the 2016 projections of the Rovuma benefits



Source: IMF (2016).

In terms of export revenues and the future balance of payments more generally, the IMF projections suggested that Mozambique's dependence on exports of LNG alone would approach 75 per cent by the mid-2020s. This compares with the 68 per cent export dependence for all extractives products in 2014, shown in Table 1. Taking account also of the buoyant hopes for new investments in several other important areas of extractive activity, the future for the economy based on a rising level of dependence on the extractive sectors looked very bright. But that boost has not yet begun: the small increase in GDP growth seen in 2017 (following the large collapse after 2015) is attributed mainly to improved coal exports and agricultural production (AfDB 2018).

2 Issues in macroeconomic and fiscal policy

2.1 A painful early lesson

However, Mozambique quickly learned the first lesson about extractive activities—one that the country has unfortunately experienced alongside other significant African producers such as Nigeria, Ghana, and Chad. This lesson is that inflated expectations, among both politicians and the public, based on announcements of substantial future windfalls, are extraordinarily hard to

manage. More specifically, *inflated expectations about future revenue are likely to lead to disastrous policy decisions*. An underlying technical point here, before we discuss the substance, is that any information about the future—especially in relation to products that are so price-volatile—involves an inevitably large degree of statistical error. Regrettably those error terms—and the large uncertainties that they imply—are rarely prominent in the popular conversations: they are overwhelmed in such conversations by the big anticipated windfalls. Further, there are large asymmetries in the available information about the future: the corporate producers of extractives typically hold a significant advantage over government policymakers in this regard. Those corporate players also have a much keener understanding of the risks they run, with large commercial losses the painful price to be paid for incorrect decisions.[6] To put it in the modern jargon, 'they have skin in the game'[7]—something that is not true of many decision makers in government.

The way this problem has worked itself out in the Mozambique context is already clear. At about the same time in early 2016 that the IMF was publishing its bullish projections, the news gradually emerged of large undisclosed public-sector loans that together probably amount to over US$2.3 billion, equivalent to about 20 per cent of Mozambique's GDP. Commentary on this matter has clearly linked these large loans to a build-up of new borrowing that started in 2013–14 based on the assumption that Mozambique would quickly become a global gas exporter.[8] The undisclosed commercial loans breached Mozambique's own constitutional provisions, its budgetary ceilings, and its Heavily Indebted Poor Countries (HIPC) and other agreements with donors—including with the IMF, which consequently suspended its programme with the government in April 2016. Some defaults and restructuring of the loans have already been necessary; an independent international audit commissioned by the IMF has been only partially successful in uncovering the true extent of the loans, and numerous accusations and recriminations about illegal, unconstitutional, and self-serving activities continue. Above all, the very hopeful fiscal picture portrayed in Box 2 has been replaced by a parlous budgetary situation (donor funds—now under threat—have accounted for 20 per cent of budget revenues) and a seemingly unsustainable public debt. The growth rate slumped from over seven per cent to three per cent by 2016, and with rising inflation and a generally weaker investment environment some of the larger expected resource projects are at least in question.[9] Some further macroeconomic detail is given in Box 3.

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6 These and related points about the inherent informational difficulties associated with the management of extractives are discussed in a recent important research report by the African Development Bank (AfDB 2017; see Roe, forthcoming).

[7] This is a concept developed more fully in Taleb (2017).

[8] See e.g., Chatham House (2016). The largest of the commercial loans was acquired purportedly to finance a tuna-fishing company, but seems in fact to have been used to acquire naval vessels and other military equipment needed to protect Mozambique's long Indian coastline—a coastline involved, of course, in the gas exploration.

[9] In the early stages of the undisclosed loans issue, there was a degree of complacency in the same public statements about the problem: after all, what is US$2.3 billion when the LNG bonanza offers over US$500 billion during the next 25 years?

Box 3: Mozambique's faltering macroeconomy

For many years from the turn of the millennium, Mozambique enjoyed spectacular economic growth combined with other generally sound macroeconomic indicators. The GDP growth rate from 2001 onwards was typically at or above seven per cent, and over 10 per cent in some years; inflation was typically around five per cent or below; foreign direct investment rose to well over US$1 billion per annum by 2010, and then remained far above that figure thereafter—the equivalent of about 30 per cent of GDP by 2016; fiscal deficits were typically at around three to four per cent of GDP; and the stock of external debt relative to gross national income had fallen from its 1996 level of over 150 per cent to less than 40 per cent by 2012 (assisted by HIPC debt relief).

However, that situation deteriorated significantly, beginning in about 2014, partly due to a decline in traditional exports, the floods of 2015, and the generally lower international commodity prices. These and other factors led to a much lower growth rate (only 3.8 per cent in 2016 and 3.7 per cent in 2017). Inflation surged dramatically but briefly to a consumer price index peak increase of over 20 per cent by end 2016. The external debt burden exploded upwards because of the new borrowing described in Section 2.1 of this paper. According to an IMF press release in March 2018, the debt-to-GDP ratio reached 128 per cent by end 2016—a ratio not too dissimilar from that seen in the pre-HIPC years. The servicing of this additional debt, together with a much-increased public-sector wage bill, has pushed the fiscal deficit to over eight per cent of GDP. The IMF's most recent assessment is that 'the outlook remains challenging. Absent further policy action, real GDP growth is expected to further decline over time while inflation would remain at current levels (i.e. about 6.5%). The fiscal deficit would expand leading to further accumulation of public debt crowding out the private sector' (IMF 2018b).

This is a difficult backdrop to the new era of expectedly buoyant revenues from extractives. The contrast between the IMF data shown in Box 2 and the gloomy prognosis of their March 2018 assessment could not be greater!

This is by no means a new problem amongst extractive-rich economies. A recent example of a similar experience is that of Ghana after it discovered oil in its Jubilee fields in 2007. That country's premature recourse to significant international borrowing through the sovereign bond markets led to an explosion of its public debt, a rapid deterioration of the country's fiscal position, and a general reduction (rather than any increase) in its levels of total investment and rates of growth. In a recent paper, Mahamudu Bawumia (currently vice president of Ghana) and Håvard Halland (of the World Bank) have analysed some of the political-economy aspects of extractives as these have impacted Ghana's macroeconomic management (Bawumia and Halland 2017). They argue that, given the reality of Ghana's closely contested two-party elections, and consistent with the political business cycle literature, incumbent governments in Ghana have generally felt the need to expand fiscal policy in election years. The introduction of a future oil bonanza into this political calculus suggests that the first government to enjoy resource rents will do all it can to remain in power, even if this involves the denial of economic common sense. Indeed, this is what happened in 2012, for example. Recent experiences in Venezuela provide an even more discouraging example of the damage that can be done by a populist approach to natural resources management (see e.g., Hanke 2015). Ironically, Bawumia also explains that Ghana, unlike Venezuela, took great pains (and sought much international advice) to build institutions that would avoid the very difficulties the country eventually experienced.[10] The subsidiary lesson here is that *even well-designed formal institutions may be powerless in cases where political pressures are themselves very strong and deep-seated.*

This first lesson has recently been elevated to the status of a new variant on the resource curse, notably in a 2017 paper by James Cust and David Mihalyi entitled 'The Presource Curse'. Their research examined 236 giant oil/gas discoveries globally since 1988, with the potential of each averaging 1.4 per cent of a country's GDP. Although in all cases these discoveries would have been expected to lead to significant increases in growth rates (typically 0.52 percentage points per annum over the first five years of the new projects), the actual outcomes were found to be systematically worse than this—dramatically so in some cases. Several countries with relatively

[10] The main challenge was to avoid the problems that had earlier befallen Nigeria.

weak political institutions saw their average growth rates decline relative to the pre-discovery rates. So the presource curse focuses on what happens in the period between the discovery of a major extractive resource and the start of production. It is clear from the evidence presented that Mozambique is far from unique in allowing over-optimistic projections to encourage excessive borrowing and spending in premature anticipation of the boom to come. The challenge is to stop this happening in future as the large levels of LNG production begin to emerge: as one senior person noted recently, the undisclosed loans are small relative to the US$500 billion bonanza during the next 25 years.

2.2 Other lessons in macro and fiscal management

Given the very large scale of the undisclosed loans and the severe constraints that they today impose on Mozambique's room for fiscal manoeuvre, some of the macro and fiscal policy choices that might otherwise have been relevant over the next few years are now less relevant. But we proceed here on the assumption that some stabilization of the present difficult macro/fiscal situation can be achieved so that some at least of the large-scale extractive investments will go ahead as planned. We recognize at the time of writing that this optimism remains in some doubt.[11] But given this relatively positive assumption, what further lessons might be gleaned from international experience?

A set of useful answers to this question can be gleaned from a mostly theoretical recent paper by Van der Ploeg and Venables (2017).[12] That paper sets out a model framework that captures the trade-offs between the alternative uses of resource revenues. This model is used to show that intergenerational efficiency in the saving/consumption choice depends on the return to investment, r, and the rate at which society trades off present consumption for future consumption, as measured by the consumption rate of interest.[13] The authors also argue that for social decision-taking (as opposed to individual decision-taking)—especially in relation to long-lived projects—it is reasonable to argue that the pure rate of time preference should be extremely small, as the impatience of the present generation does *not* establish its right to consume at the expense of future generations. So, accepting the assumptions of their model, and a given budget constraint, when the rate of return on domestic assets, r, is relatively high, the consumption element of local spending should be relatively low initially (with investment high) but rise more rapidly in the future; that is, consumption should grow fast over time. In other words, for any lower-income developing country where income is growing, the poverty reduction needs are greater now than they will be in future, implying that greater weight is placed on the present.[14] This in turn leads to the first main policy conclusion for countries such as Mozambique: *the savings rates out of natural resource revenues should ideally be high, but the priority should be to invest these revenues in the domestic economy.*

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[11] The inherent uncertainty about the local Mozambique situation is intensified by the rapidly changing nature of the global LNG market. For example, the buyers for LNG are fragmenting, contracts seem to be becoming shorter term, and new projects are increasingly on brownfield sites but FLNG is becoming more significant. These tendencies were detailed in a recent conference presentation by Anne-Sophie Corbeau (2017).

[12] See also Venables (2016) and Venables and Willis (2016).

[13] Which in turn is defined as $\rho + \eta g$, where g is the (trend) rate of growth of consumption and the parameter $\eta > 0$ is the inverse of the elasticity of intertemporal substitution (capturing the rate at which the marginal value of consumption diminishes as individuals become richer).

[14] That is, the future is discounted more heavily, especially if intergenerational inequality aversion is large.

Van der Ploeg and Venables (2017) next use the model to remind us that in an economy that has access to perfect international capital markets and suffers no capital scarcity, the intertemporal smoothing of consumption will conform to the pattern suggested by the permanent income hypothesis (PIH). This in turn would suggest that all savings and the resulting asset accumulation after a natural resource windfall should be placed in foreign assets, such as an SWF. However, this theoretical result, they argue, is largely irrelevant for lower-income developing economies such as Mozambique. The PIH result is driven by the assumption that the economy has expanded its capital stock to the point where the marginal product of capital is equal to the constant and exogenous world interest rate. This may be relevant for a fully developed economy with abundant capital where investment levels are already optimal, but not for any economy that faces many difficulties in borrowing, as Mozambique currently does, at least on reasonable and sustainable terms. The adaptation of the model to encompass these realities leads to the result that *the greater the capital scarcity in an economy, the bigger the fraction of the increment in total assets that should be allocated to domestic capital.*[15] Subsequent to the undisclosed loan scandal, this result fits well with Mozambique's current fiscal situation.

However, this result is also qualified theoretically by the further point that as capital is accumulated and debt is reduced, the (domestic) rate of return falls, so a developing economy could in principle converge to look more like an economy with no capital scarcity.[16] While this is happening, room is made for investments to stimulate growth and development. In brief, once the model framework is modified to include the key developing country features of capital scarcity and high borrowing costs, the policy messages are significantly different from those of the PIH. Specifically, the optimum consumption increment is front-loaded: natural resource revenues should be used principally for domestic investment, and this in turn should in principle advance the development path of the economy.

Possible reasons for not investing windfalls in domestic assets

However, there are three main reasons why a country might choose not to follow the advice above and not invest most of its windfall public revenues in domestic assets. They are as follows:

- The country may face at least a short-term *limit on it absorptive capacity*, for example because of various bottlenecks that might constrain any new investment—e.g., a paucity of high-return projects ready to be implemented even when finance is available. In the public sector there is unlikely to be a pipeline of good investment projects.[17] These problems must be addressed before effective investments can be undertaken, which, as Paul Collier has long argued, implies a strong case for 'investing in investing' (e.g., Collier 2010). Van der Ploeg and Venables (2017) argue that in these cases, it makes no sense to spend natural revenues for the sake of it on inefficient projects. Instead, there is a strong case for establishing

[15] In the limiting case where the country is completely shut out of capital markets, the whole of any increase in assets goes to *domestic* capital formation.

[16] Thus, starting from a low base, capital is accumulated, income rises, and the rate of return falls, ultimately reaching a level like that in high-income countries, where it can support similar levels of income and consumption. This in turn leads to some interesting conclusions about the optimal time path of consumption. Specifically, the consumption increment (relative to that seen in the pre-windfall baseline) is largest immediately after the windfall, and then declines. This result is in marked contrast to that obtained from the PIH modelling, where the consumption increment is constant through time. The intuition behind this is that the current generation is poorer than future generations (if there is positive growth), so the consumption increment is skewed towards this poorer generation.

[17] For example, because of a lack of capacity to design and develop projects; because project selection and cost-benefit processes may be weak; and/or because the capacity to procure, implement, and monitor projects is limited.

some sort of 'parking' fund where natural resource revenues can be placed in the short term until they can be used efficiently in the domestic economy. This should of course be accompanied by strenuous efforts to develop improved capacity to build a pipeline of good efficient projects. This logic further suggests that investment should be ramped up only slowly, and that contrary to one of the results from Van der Ploeg and Venables (2017), natural resource revenues might be parked, temporarily at least, in foreign assets until they can be spent in a cost-effective manner on the efficient investment path (see also Venables and Willis 2016).

- The second possible reason relates to the often-expressed need to *protect the interests of future generations*. This argument can be taken to imply the accumulation of a significant investment portfolio of financial assets comprised mainly of assets with longer-term maturities. However, as we saw earlier, the relevance of such reasoning in most LIC cases, including Mozambique, is questionable, since it relies on the proposition that returns on additional domestic investments are already close to those that can be achieved from available alternative (foreign) assets. By contrast, when the reality of intense capital scarcity is brought into the picture, as explained above, investment in the domestic economy becomes a much higher priority, and the case for a long-term intergenerational fund is consequently weakened.

- The third reason, which is more compelling, is the need to *insulate the economy from short- to medium-run fluctuations in commodity prices*. Given the likelihood of such fluctuations, it makes sense to accumulate precautionary buffers in a stabilization fund, especially since it is difficult to hedge away all this risk using financial derivatives. *Most natural-resource-exporting countries are well advised to self-insure by using stabilization funds*. These funds provide a stock of assets that can finance countercyclical fiscal policy when monetary policy is constrained. Of course, behaviours of the type that explain the presource curse, and other similar fiscal behaviours, tend to do the opposite of this, namely adopt pro-cyclical fiscal stances in response to commodity-price volatility. One practical problem is that any stabilization fund would need to invest mainly in short-maturity assets, thereby making it incoherent with any fund that was designed mainly to help future generations (see also Box 4). Fortunately, there are other fiscal stabilization devices/rules that have worked elsewhere that do not require the establishments of an SWF[18] (see Kopits and Symansky 1998 for examples).

[18] It is useful at this point to quote a recent summary by Lahn and Stevens (2017: 7) relating to the use of stabilization funds. They note: 'studies on the effectiveness of stabilization funds tend to agree that they "must be part of a broader package of institutional reforms designed to improve the country's capacity for resource revenue management" (Dixon and Monk 2011: 5) and that their usefulness depends on the quality of public financial management systems (IMF 2007). As the examples of Chad, Nigeria, Iran, and Cameroon demonstrate, where these are lacking, the original aims and rules of the funds are simply not followed (Collier and Venables 2011: 11–17). Even the existence of well managed funds does not preclude unsustainable fiscal policies or the use of fund resources as collateral for reckless borrowing (e.g. Kazakhstan in the 2000s).'

Box 4: Some pros and cons of an SWF

The establishment of an SWF has become almost de rigueur for the newly oil-and-gas-rich economies of sub-Saharan Africa, including Mozambique and Tanzania. Any SWF is taken as a signal to both local and international observers of a country's seriousness about managing its new resource wealth, including its capacity to resist short-term populist and political pressures to spend quickly. Unfortunately, the lofty rhetoric is often far removed from the realities that surround the set-up and operation of such a fund.

First, no African LIC is anything like Norway—the originator of one of the world's largest and most successful SWFs. Roe (2016) pointed out that in 25 years, the Norwegian SWF accumulated assets that amounted to almost US$900 billion (growing to exceed US$1 trillion by end 2017). That is equivalent to US$178,000 for every one of Norway's 5 million inhabitants (adults and children), or more than US$700,000 for a typical family of four. It is also equivalent in size to the whole economy of many MICs such as Mexico. Further, in the years since the fund was established, Norway has typically enjoyed large fiscal surpluses—often around 10 per cent of GDP—with oil and gas revenues contributing a significant part of this. Hence it has been able to make regular additions to the fund by utilizing just a small percentage of those surpluses. This contrasts with the case of Tanzania, which recently set up its own SWF: the Natural Resource Governance Fund.[19] Although Tanzania has run significant budget deficits for many years, the government might still be able to commit an average of, say, 0.5 per cent of GDP per annum to the new Natural Resources Governance Fund. Given Tanzania's per-capita income of circa US$1,000 and its population of 50 million, this will build capital at the rate of US$5 per capita and US$250 million per annum. So it will take a very long time to build up a fund of any size. For example, after some 10 years—assuming a steady gas price and no withdrawals—the fund would grow to a total of US$2.5 billion plus net interest on the accumulating capital balance: circa US$50 per capita. Imagine the political infighting at budget time associated with preserving such a balance untouched. Similar challenges have proven too much for other countries, such as Ghana and Chad.

Second, the administrative costs of establishing and operating an SWF—which clearly reduce the value of the fund—are subject to very substantial economies of scale. For example, Norway can run its SWF at a cost of well under 0.5 per cent of capital value. But Tanzania would face many of the same fixed costs and would need to cover these from a fund that would initially be only a few tens of millions.

Third, the logic of Van der Ploeg and Venables (2017) identifies the three main reasons why a country might choose to place its resource windfalls partly in an SWF. Unfortunately, these three types of motive require quite different types of investment fund of foreign assets (e.g., short-term maturities for stabilization purposes, and longer-dated securities for supporting future generations), since they involve investments for quite different purposes. Not only does this complicate the administrative headache, but it might also mean that the fund needs multiple legal structures and investment mandates, even if for reasons of administrative convenience these are all managed by the same government agency.

Mozambique in recent years has made several partial commitments to the establishment of an SWF, but based on public domain information it appears not to have specified in too much detail the motives that drive this possible institutional development. Plans for an SWF were first announced back in 2014, but were not at that time developed. The previous government headed by President Armando Guebuza decided not to put extraordinary revenues, such as those from capital gains tax, into a special account, arguing that the country had urgent shorter-term needs that any windfalls should be used to address. However, the present government announced in August 2017 that a new National Development Fund with many features of an SWF would in fact be established and would probably be managed as an autonomous agency under the umbrella of the National Investment Bank (Frey 2017). The March 2018 Article IV review by the IMF broadly endorsed the need for such a fund (IMF 2018a: 20). However, since detailed plans are yet to appear, the authorities would be well advised to heed the advice of Van der Ploeg and Venables (2017) that a country needs to be very clear about which of several main motives justify the establishment of such a fund, and to be cognizant also of the quite different investment strategies and management and regulatory structures that are needed.

2.3 The role of a national oil company

The issue of NOCs and their roles is included here because these institutions are commonly an extremely important component of the macro and fiscal management situation of oil-and-gas-rich economies such as Mozambique. Heller et al. (2014) in a paper for the Natural Resource

[19] This was announced as part of Tanzania's new Petroleum Act of 2015.

Governance Institute (NRGI) have shown that in many countries (e.g., Azerbaijan and Angola) *more than half* of all government revenues may pass through the hands of the NOC. In cases where the NOC is responsible for fiscal revenues as large as this, it adds to its commercial roles a de facto fiscal authority, operating in this regard in parallel with the mainstream ministry of finance. Such a situation is almost guaranteed to create a tension between the executives managing the NOC—who will invariably try to retain a large share of total revenues—and the treasury/ministry of finance, which will argue for keeping a greater share of funds under its own control.

It is not at this stage clear how large will be the revenue take that will accrue at least initially to Mozambique's Empresa Nacional de Hidrocarbonetos EP (ENH) once the large LNG revenues begin to materialize.[20] However, a limited insight into this is available from the IMF fiscal data projections shown in Box 2. Even if ENH receives only the element of total revenues referred to in Box 2 as 'state participation', it would still be receiving the equivalent of between three and five per cent of GDP annually over the life of the LNG activities. If it also participates in the profit share and dividend incomes from the LNG, then those numbers could be much larger. In any event, there is clearly a shared fiscal responsibility involving ENH that needs to be managed consistently with the general principles of securing and maintaining macroeconomic stability.

Having said this, from the viewpoint of the governments of many oil-and-gas-rich economies, NOCs often represent the *sine qua non* of a strategy capable of delivering long-term benefits to citizens. Local politicians quite reasonably assume that there are few better ways to manage the often-huge income flows associated with this sector than via a nationally controlled enterprise that is answerable mainly to the government of that country. Above all, as in the case of Mozambique, it gives a state-owned entity a share in the ownership of major oil and gas operations. Following this logic, several of the newer oil-and-gas-rich economies in Africa, such as Tanzanian (with the Tanzania Petroleum Development Corporation) and Mozambique (with ENH), have created some form of NOC.[21] In assuming the merits of a NOC, they can draw on the evidence of several highly successful cases from other countries. Examples of the world's most successful NOCs include Norway's Statoil, Saudi Arabia's Saudi Aramco—soon to be floated on global stock markets—and Malaysia's Petronas. These companies have maintained vigorous exploration programmes, delivered strong returns on public resources, decreased long-term reliance on costly private partners, and as a by-product helped to promote the rise of a technocratic class of private businesses and professionals.

However, a closer look at the lessons from international experience reveals a more worrying aspect. For a notable recent example, one need look no further than the large Brazilian NOC Petrobras. Until 2016 Petrobras would have been thought to belong to the category of successful NOCs listed in the previous paragraph. It was categorized as such by Heller et al. (2014). However, Petrobras's rapid fall from grace underscores several risks that are common to NOCs and that

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[20] ENH's position regarding the receipt of revenues is underpinned by its legally established situation in Mozambique. It has legal control of the country's upstream oil industry, holds exclusive rights to explore for and develop petroleum in Mozambique, and is permitted to exercise those rights in association with foreign investors. ENH is responsible for participating in all petroleum operations and stages of activities (prospecting, exploration, production, refining, transport, storing, and commercialization of oil and gas and their derivatives, including LNG and gas for liquids) inside the country or abroad, and is also responsible for managing the oil and gas quotas destined for the development of the national market and the country's industrialization. The Petroleum Law expressly states that any investor interested in the exploration of petroleum resources in Mozambique shall enter into a partnership with ENH.

[21] As indeed have countries that found oil or gas earlier: for example, the Nigerian National Petroleum Corporation, the Ghana National Petroleum Corporation, and Angola's Sonangol.

need to be addressed seriously by any new oil and gas country that is operating such an institution. Above all, NOCS are invariably positioned at the intersection of public policy, commercial ambition, massive economic rents, and networks of established elites. This renders them highly vulnerable to being used as vehicles for patronage and corruption: vide Petrobras and the senior Brazilian figures alleged to have benefitted personally from its activities. The challenge here is to manage any NOC to realize the benefits that can undoubtedly come (vide Aramco), while mitigating the macro/fiscal management dangers mentioned above and avoiding the potentially disastrous political-economy risks that have so damaged Petobras and Brazil.

The detailed NRGI paper by Heller et al. (2014) listed nine main lessons/recommendations for NOCs, derived from a study of 12 different NOCs in diverse geographical and operational contexts. These nine recommendations are listed (but not discussed in any detail) in Box 5.

Box 5: NRGI's nine recommendations for NOCs

The commercial mandate:

1. Clearly define the commercial and non-commercial roles. Limit the non-commercial activities where sophisticated commercial activities could heighten the risks and costs of conflicts of interest (e.g., limiting the regulatory roles of the NOC when the commercial system is in any way competitive, and limiting any general public expenditure or national development role[22]).
2. Develop a workable revenue retention model.
3. Enhance access to external financing by listing some NOC shares on public stock exchanges or issuing external debt where appropriate.

Limitations on political interference in technical decisions:

4. Define clear structures and roles for state shareholders.
5. Empower professional, independent boards of directors
6. Invest (heavily) in NOC staff integrity and capacity.

Transparency and strong oversight:

7. Maximize public reporting of all key data (revenues, costs, transfers to and from the state, results of oil trading, etc.).
8. Secure independent financial audits and make these available to the public.
9. Choose an effective level of legislative oversight (e.g., make the NOC answerable to the legislature without unduly limiting its freedom to make technical decisions).

Source: adapted from Heller et al. (2014).

Here we focus mainly on the macro-related aspects. In particular, how is a balance to be struck between (i) leaving a NOC short of the funds it needs to properly discharge its large commercial responsibilities (large often in relation to the total macro economy) and (ii) leaving the NOC with an underused surplus of funds (which because of absorptive capacity and other constraints it is unable to use productively) while at the same time denying the ministry of finance the funds it could use to meet pressing budgetary demands? The global experience provides examples of both possible mistakes. Heller et al. (2014) identify several major NOCs—the National Petroleum Corporation (Nigeria), Pemex (Mexico), and Petronas (Malaysia)—that do not have predictable access to sufficient revenue flows to consistently cover their operational costs, and that fail to fully deliver as a consequence. In the case of Petronas, it has been argued that this is because of ever-

[22] Petróleos de Venezuela SA during the Hugo Chavez regime is an extreme example of this error, spending as it did for a while much more on social programmes than on oil-related programmes.

higher transfers of profits back to the state. At the other end of the spectrum is the sad case of Sonangol-Angola, which for a period prior to 2014 had the de facto authority—with few checks and balances—to retain huge revenue flows. An IMF audit (IMF 2014) uncovered an 'unexplained residual' in state accounts, initially measured at more than US$31 billion between 2007 and 2010 (equivalent to one fourth of annual GDP).

The key to answering the question about the appropriate balance between the two possible revenue-retention extremes defined in the previous paragraph lies with the first recommendation in Box 5. If the commercial mandate of a NOC is clearly defined, and its associated strategic plans, investment programmes, and deliverables are competently developed (in line with agreed national objectives) and monitored, then its legitimate funding needs should be reasonably clear. If on the other hand—as for example in the case of Nigeria, where the commercial priorities have only ever been loosely articulated, or Venezuela, where a great slough of ad hoc social obligations have been laid at the door of the NOC—then it is well-nigh impossible to establish a coherent revenue-retention regime in line with a country's macroeconomic requirements. Indeed, the underlying—if unstated—motive for failing to clearly define the commercial mandates of a country's NOC may well be to avoid the difficult constraints and choices that are often associated with the setting of national fiscal expenditure targets. But it goes without saying that such motives are seriously misplaced: they cannot override the inexorable logic of a country's macro and fiscal constraints.

A final point regarding Mozambique's situation in this respect relates to Paul Collier's recommendation about the need for 'investing in investing'. (e.g., Collier 2010). Given the huge revenue flows that will accrue to ENH as well as to the Mozambique Treasury, this is a matter that needs very serious attention in both institutions. ENH has the huge responsibility, involving prospectively billions of dollars of investment, for prospecting, exploration, production, refining, transport, storing, and commercialization of oil and gas and their derivatives.

Some useful guidance on this matter is available from the case of Botswana.[23] A major study on extractive industries and human development published in 2012 included the following comments about Botswana's approaches to investing its diamond revenues:

> One of the major contributors to Botswana's success in translating diamond revenues into rapid economic growth (and ultimately human development) was a firm insistence on good quality appraisal of each public investment project. The writing of sound appraisals, and the *recognition and rejection of weak or inadequate appraisals*, was a required capability for officials to advance their careers in the Ministry of Finance. In addition, the public investment programme in Botswana was careful to provide for the recurrent costs of maintenance of new public assets. There was a rule of thumb that some 18 per cent of the capital cost needed to be budgeted to operate any asset—whether a school, medical facility, road or bridge. When they went and checked later, planners found that the ratio was a bit higher and cut back the investment programme as a result. (Henstridge and Page 2012: 21, drawing on AfDB 2015; my emphasis).

[23] However, I lack sufficient knowledge to know how well or otherwise the existing arrangements in Mozambique square up to those in place in Botswana.

2.4 Tax and royalty regimes

The last matter to discuss in relation to the topic of macro and fiscal management is that of a country's choice of a tax regime. We recognize that a tax and royalty regime is already well established in Mozambique.[24] The following paragraphs therefore merely seek to indicate a few international lessons that might be relevant in future if and when the existing arrangements come under review. There is always a very difficult balance that the governments of extractive-dependent economies face between (i) taxing too lightly, thereby denying the country a fair share of the mineral proceeds, and (ii) taxing too heavily and risking the loss of large amounts of existing or potential investment. This balance needs to be struck in the face of often very significant unpredictability of both prices and profits.

The first point to make is that there is a major difference between the typical tax regimes that are applied in relation to mining versus those that apply to oil and gas. These differences are spelled out in some detail in Dietsche et al. (2013), and so can be merely summarized here. In the oil and gas sectors, PSAs are most commonly used. These are agreements whereby the government (or NOC) contracts a private company to carry out oil or gas operations while itself retaining ownership over the oil or gas reserves. Once oil or gas is extracted, the company is entitled to a share of production to recover capital expenditure and reimburse agreed operating costs. The rest of production (often referred to as 'profit oil') is shared between the government (or NOC) and the company in proportions defined in the PSA. Additionally, the company is normally required to pay corporation tax on 'taxable income', as well as other taxes: for example, withholding taxes, customs duties, value-added tax (VAT), etc. (Dietsche et al. 2013: 24). This system has the great advantage of delivering revenues to government at quite an early stage in the life cycle of a project—hence the large early revenue receipts for Mozambique shown in the IMF data in Box 2.

By contrast, in the case of mining operations, countries typically use concessions or 'tax and royalty regimes'. What this means in practice is that the private investor owns 100 per cent of the materials produced, but bears all the risks and the costs of all the operations. The revenues accruing to the host government generally comprise first a royalty payment, and then (typically after a lengthy lag) income/corporation tax on profits; these revenues can sometimes include additional income taxes on 'excess' or 'windfall' profits (e.g., imposed in response to higher than expected mineral prices). Additionally, the private companies will normally pay other national taxes such as VAT, withholding taxes, customs duties, and any employment levies. The main disadvantage of this system is that it is heavily dependent on corporation tax receipts, which can be delayed for many years thanks to the typically generous depreciation offsets to which companies are entitled because of their very large upfront investments.

In the two decades from the mid-1990s, which saw significant new mining investments in LICs (see Table 1), there was initially a tendency for some countries with relatively weak mining-sector legal and fiscal frameworks to eschew the use of general taxation rules and instead to enter into Mining Development Agreements (MDAs) with investing companies. An MDA provides specific

[24] It is understood that in relation to oil and gas, taxation is based on the oil taxation regime as revised in 2014 under Act 27/2014 of 23 September, which subjects taxable parties to the general taxation rules applicable in Mozambique, namely regarding income taxation (IRPS and IRPC) and consumption taxation (VAT), as well as to a specific tax on petroleum operations and certain special rules determining IRPS and IRPC, which differ somewhat from the general rules. In relation to mining, organizations operating mining concessions are subject not only to the general taxation regime but also to the special taxation regime established under Act 28/2014 of 23 September, namely (i) a Tax on Mining Production ('*Imposto sobre a Produção Mineira*'), (ii) a Surface Tax ('*Imposto sobre a Superfície*'), (iii) a Tax on Income Deriving from Mineral Sources ('*Imposto sobre a Renda de Recurso Mineiro*'), and (iv) special rules to determine taxable income under IRPS and IRPC (Lex Mundi 2015: 45).

fiscal and other regulatory terms for each mining project, and these terms can differ between otherwise similar companies and projects. Host governments thereby acquire a tool to incentivize particular companies/projects, but also open up a device that is prone to be captured and corrupted. In more recent times, and in response to emerging concerns over the unbalanced bargaining strengths between government and industry, resource-richer countries have moved away from MDAs and instead have made greater efforts to have fiscal and other terms defined in general taxation legislation. This we understand to be the situation in Mozambique after its new tax legislation of 2014, albeit still with some special arrangements for petroleum and mining operations.

In a recent review of global practice, James Otto (2017b) confirms this tendency, but argues that there is still a need in many countries to commit to the further strengthening of the underlying systems of general taxation law—both their design and, equally importantly, their practical implementation. It is noted that some countries that have good tax systems on paper still suffer from very poor rates of collection and administration more generally, and still face some of the specific implementation problems of previous MDA arrangements. Otto also notes the various types of tax discrimination (differing tax deals for extractives) that are still evident in global practice for the mining sector. These include, for example, discrimination by reference to mineral type, to size of investment, to stage of the mining life cycle, to different types of cost (e.g., exploration costs versus operational costs), and to the nationality of the investor. Although there are often credible reasons to introduce such deviations from the rules of general taxation, he notes that the greater the non-uniformity of the tax system, the inherently more complex and difficult it will be to administer. He cites many examples—and often-unintended consequences—of the specific special treatments that some countries have accorded to the taxation of mining in the past.

Otto (2017b) also provides an assessment of the adequacy of prevailing mineral taxation systems around the world, and notes the disappointingly slow progress made by the tax authorities in both developed and developing nations in stemming the fiscal leakages that result from transfer pricing and other tax avoidance practices. He argues that the transparency initiatives of the past 10–15 years[25] have made an important difference in this area but have not fully got to grips with all the underlying problems. For example, some nations still lack basic provisions in their mining and tax laws to control output price manipulation, while others have introduced such provisions only relatively recently. International 'standards' such as the OECD's (2017b) 'Transfer Pricing Guidelines for Multinational Enterprises', in Otto's opinion, have been ineffectual when applied to the mineral sector. In his opinion, most nations today have developed their mineral sector tax systems to achieve a 'theoretically' fair balance between national and investor interests, but transfer pricing leakages remain a major challenge.[26]

Other authors have also elaborated the problems of capacity in host governments in this area of regulation. Alexandra Readhead (2016) in a recent paper for NRGI points out that progress in building this capacity in extractives jurisdictions has been slow. She argues that the problems that many countries face derive mainly from (i) overcomplex tax regimes and (ii) special dispensations on a project-by-project basis. Together these place a severe strain on tax authorities, who are faced with the complex financial structuring that companies use to avoid tax. Preliminary results from

[25] Mineral sector taxation transparency is an issue that has seen rapid change in recent years due to two main factors. These are (i) the Extractive Industries Transparency Initiative and (ii) the shift away from secretly negotiated agreements (arranged with individual companies) towards standardized licensing and/or the public disclosure of negotiated agreements.

[26] A separate UNU-WIDER project is examining this matter more closely by using administrative data.

research by the Institute for Mining for Development (IM4DC 2014) suggests that among 26 countries surveyed in Africa, including Mozambique, most do not have the requisite capacity to implement effective transfer pricing rules.[27]

A further extensive discussion of the principles involved in the design and implementation of tax regimes can be found in ICMM (2009).[28] One of the additional points made there relates to the tricky issue of how to retain some flexibility in taxation arrangements to try to mitigate the revenue-sharing consequences of the high degree of volatility that characterizes oil and gas and mineral prices.[29] That flexibility is mainly seen as a means to retain a degree of fairness in the sharing of revenues between companies and governments as external circumstances (mainly product prices) change. That is the logical motivation for so-called stability agreements between governments and companies—a possibility that is built in as an option under Mozambique's regime for both petroleum and mining taxation.[30] The 2009 report by the International Council on Mining and Metals (ICMM) notes that mining agreements have quite sensibly often locked in fiscal conditions to safeguard companies from future (arbitrary) legislative changes. But in many countries these clauses have become a contentious issue, since they are often seen as too favourable to the companies.[31] The same report also notes some country-by-country differences in approaches to stabilization: Peru, for example, has offered a wide stabilization of the legal framework for tax, while Chile has offered merely a fixed income tax rate for a period of years (ICMM 2009: 33). Recent cases of countries seeking to hike tax rates (or use windfall taxes) in periods of rising prices (e.g., during the super-cycle of prices from around 2001 until around 2011) have had mixed success: Australia and Zambia are two examples of this. The overall conclusion on this point is that stabilization-type arrangements are a sound idea in theory; however, in practice they are difficult to operate successfully, given the inherent difficulties of anticipating the uncertainties that need to be addressed by any stabilization plan.

In recent years, as so-called resource nationalism has become more common, several governments (most recently Tanzania in 2017) have taken a close look at whether their original deals with companies should be considered legitimate or not. These are cases where host governments seek to change previously agreed tax arrangements for extractive companies, independently of any actual price movements or other changes that could justify a revision. It goes almost without saying that, unless the original deals were demonstrably and egregiously unfair, these unilateral *ex post* adjustments can be enormously damaging to a country's standing as a location for international investment. Furthermore, via Laffer curve-type effects they may even reduce rather than increase the total revenues accruing to a government (especially if the policy change leads to a downturn in new investment in the sector).

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[27] IM4DC (2014: 6) does acknowledge the significant efforts being made in several African countries, including Mozambique, but also notes that 'their efforts are in some cases being constrained by a generally inadequate level of resources and expertise.'

[28] ICMM (2009) also provides a detailed exposition of the pros and cons of a royalty-based system as opposed to one based mainly on corporation tax and other conventional taxes.

[29] Such flexibility—if it can be designed and managed—is a possible complement to fiscal rules that can help to mitigate the harm that can arise from big price variations.

[30] Specifically, this option is open to companies and government and will normally apply for 10 years from the approval of a development plan (by the companies). This tax stabilization mechanism may be extended for more than 10 years and until the conclusion of the initial concession against the payment of two per cent, additional to the rate on Petroleum Production Tax or Tax on Mining Production, from the 11th year of production onwards.

[31] Some have argued that investors were provided with enhanced protection at a time when the bargaining position of countries was particularly weak (UNCTAD 2007).

3 Issues in structural policy and transformation

3.1 Why transformation?

Mozambique, in common with some other resource-rich African economies, has seen only intermittent (often reversed) structural transformation in the 40 years since it gained its independence. As is shown in the UNU-WIDER paper by Cruz and Mafambissa (2016), around 80 per cent of Mozambique's labour force is still in agriculture, livestock, forestry, and fisheries, and working with low-productivity technologies.[32] Notwithstanding the high rates of GDP growth achieved in most years since the turn of the millennium, the manufacturing share of GDP stood at only 9.4 per cent by 2016 (versus 17.4 per cent in 2001), and the share of manufacturing, mining, and utilities stood at only 17.3 per cent (an almost identical figure to that recorded in 2001), according to United Nations national income statistics. Nonetheless, there is today a relatively significant industrial capacity comprising a variety of large, small, and micro enterprises.[33] In the early post-independence years,[34] the government allocated massive investments to agriculture and industry.[35] As a consequence, the statistical share of industry in GDP rose for a time, as did the overall growth rate of the economy. But these gains, achieved under a tightly *dirigiste* set of policies, were short-lived; the fourth Frelimo Congress, held in 1983, took place against a background of declining growth and lower industrial output, partly attributable to the distraction of a costly war (Cruz et al. 2015). However, following the Economic Rehabilitation Programme begun in 1986, the peace treaty in 1992, and the new impetus to more liberal industrial policy after 1997, the share of manufacturing once again rose (from its early 1990s average of below nine per cent) to well above 15 per cent by the mid-2000s, only to decline once more to the 9.4 per cent now seen.

At a time when the scale and economic significance of extractive resources (LNG, numerous metals, coal, etc.) is larger than at any previous time in Mozambique's history, possibly the most important message in this paper is the following: *extractives activity can boost the economy significantly in the next several years, but should not be seen as the long-term future of the economy*. The extractives boost should rather be seen as an opportunity to stimulate a whole range of non-extractive activities that have the potential to continue to generate incomes and jobs into the very long-term future when the present extractive resources are declining if not fully depleted. In other words, it should be seen as an opportunity to support a major structural transformation of the economy. As is fully documented in Cruz et al. (2015), from the late 1990s onwards industries involved in extraction were beginning to play a much larger role in the overall industrial structure of Mozambique's economy.[36] But that impetus now is likely to be much larger than in the past, and so too therefore are the potential opportunities to catalyse faster structural transformation.

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[32] See also Tarp et al. (2002) and Jones and Tarp (2012). The agricultural share of GDP is around 30 per cent.

[33] Further information can be obtained from UNU-WIDER et al. (2018).

[34] In 1975, Mozambique was the eighth largest industrial producer in sub-Saharan Africa, with a manufacturing contribution to GDP of more than 10 per cent. Some contribution to this came from its prevailing protective policies as well as from the spin-offs from Cabora Bassa, one of the largest hydropower plants in Africa (Cruz et al. 2015: 8). Manufacturing value-added was above 10 per cent of GDP.

[35] Especially after the decisions of the third Frelimo Congress in 1978–79.

[36] Cruz et al. (2015: 19) mention in particular the following: 'Kenmare, a US$460 million heavy sands extraction and exporting investment in Moma, Nampula province (2004: started construction); Sasol, a total amount of US$1.0 billion natural gas extraction and exporting investment in Pande and Temane Inhambane province (2002: construction); Vale, a US$1.26 billion coal extraction and exporting investment in Moatize, Tete province (2007: construction); Rio Tinto,

This message has been developed in greater detail in a recent Chatham House paper by Paul Stevens et al. (2015), and more recently in Lahn and Stevens (2017). These authors remind us that extractives are always a depletable resource (even though the time horizon for depletion can be very long in some cases). Because of this reality, other productive activities will in time need to replace them if any initial boost to growth and development is to be sustained. In other words, *economic diversification is central.* It follows that policies to identify, promote, and develop strategies towards these 'other' activities—including agriculture[37]—are a vital component of a broader strategic approach to accommodating an extractive industry. This is of course a pragmatic proposition, but it is underpinned by a forceful piece of economic theory known most commonly as the Hartwick rule (see Hamilton and Hartwick 2005). This rule states that resource-rich countries, in order to maintain wealth and build strong foundations for economic growth, should offset the depletion of their natural resources by commensurate levels of investment in produced capital—primarily infrastructure and human capital.

Compliance with this rule opens up a very wide range of policy challenges for any host government, because it requires a significant level of buy-in by and coordination between a wide variety of government ministries and agencies, involving not merely the narrow set of agencies that deal directly with petroleum and/or minerals (such as MIREM, ENH, INP, and ENHL). It also requires a high-level vision that not only defines the long-term economic future to which the country can aspire but also manages to work to sustain this vision consistently, in spite of the many short-term pressures, political factionalism, and election-driven incentives that will undoubtedly try to dislodge it.[38] Mozambique already has some experience of this type of challenge, in that since 1997 (following the significant privatization effort of the late 1980s and 1990s) it has developed a series of industrial policy and strategy (IPS) programmes that have together strengthened the country's capacity to manage industrialization and other aspects of structural change. Some main aspects of these programmes are described in Cruz et al. (2015), and their central features are summarized in Box 6.

In light of the track record described in Box 6, the big question for Mozambique would seem to be whether the component parts of policy as described can be shifted up several gears to deal with the much larger volume of opportunity that will be presented when the large LNG activities begin to make their impact. Can the existing institutional arrangements be substantially improved and effectively coordinated so that they work cohesively to support a clear long-term vision for economic change? If a vision is identified, can it credibly be sustained over a long enough period to have a tangible impact?[39]

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a US$849 million coal extraction and exporting investment in Benga, Tete province (2009: construction-Riversdale); MOZAL, a US$2.3 billion aluminium smelter investment in Matola, Maputo province (1998: construction)'.

[37] Agriculture as such is not much discussed in the present paper, but aspects of its role are discussed in some depth in other publications. See for example Government of Mozambique (2016) and Arndt et al. (2012).

[38] South Korea (even though not dependent on extractives) is perhaps the best example: by sustaining such a vision, it was able to transform the war-torn and poverty-ridden economy of the 1950s into an industrial powerhouse by the end of that century.

[39] This paper does not seek to explore the very complex and difficult political economy of the situation. But very useful assessments of this are available, for example in Bertelsmann Institute (2016) and International Law and Policy Institute (2013).

Box 6: Features of previous IPS programmes

The 1997 IPS established a typical liberal approach to industrialization. In particular, it assigned a central role to the private sector (including the foreign private sector) as the source of new projects, investment, funds, technology, and know-how. The role of the state was to orient, regulate, and supervise industrial development while also building the appropriate supporting environment, including appropriate incentives for economic activities and the funding of those public investments necessary to support the private sector. The government adopted several supporting approaches for the implementation of the strategy, including (i) the development of micro, small, and medium enterprises and (ii) the improvement of training and skills acquisition. As regards public investment, the strategy focused on the development of relevant infrastructure, including industrial zones and services such as the supply of water and electricity, research and technical assistance, and quality control. There were in addition a number of measures designed to improve access to credit, reduce bureaucracy, and generally improve the environment for successful private investments.

The 2007 IPS, Cruz et al. (2015) argue, represented an improvement over the previous IPS programmes, in that it adopted a more coordinated industrial system and was in general a more complete and articulated document. Significantly, it included specific ideas for the utilization of natural gas, coal, and heavy sands.

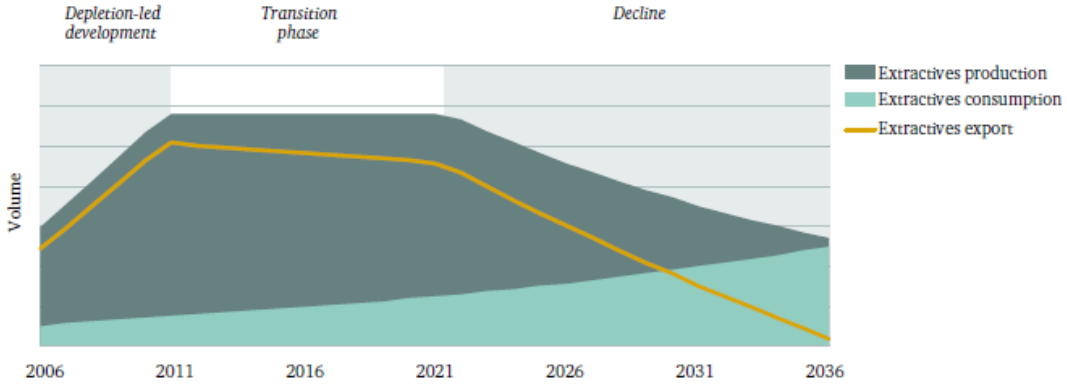
Cumulatively these programmes have enabled the country 'to establish and run, with a relative degree of success, some of the necessary institutions for sustaining industrialization' (Cruz et al. 205: 17). The institutions that Cruz et al. identify include:

- the Beluluane export processing zone, hosting the MOZAL smelter project and its suppliers, with investment amounting to more than US$2.3 billion
- the Nacala rapid development zone
- the Institute for the Promotion of Micro, Small, and Medium Enterprises
- the statute for micro, small, and medium enterprises
- the district development fund
- the Maluana technology park
- a one-stop electronic window for clearing imports

There has been a significant volume of published research on the outcomes of these programmes over time, which collectively documents the successes but also the many remaining weaknesses of the policy approaches. These too are summarized in Cruz et al. (2015).

There are several pathways towards structural transformation that show up in the record of other extractives-rich economies. One is what Lahn and Stevens (2017) term 'depletion-led diversification', where countries with long-lived and high levels of per-capita resource develop mainly energy-intensive industries with strong linkages to their resources sectors. This is a pathway that leads to only a slow long-term reduction of dependence on extractives, but it can extend gains in living standards for lengthy periods. Saudi Arabia and some Gulf states are prime examples of this pathway (with their strategic moves to diversify their economies coming only recently), but the authors also cite Trinidad and Tobago, Canada, and even Australia as examples. More relevantly for Mozambique, they suggest that any country expecting a relatively short-lived access to extractives must have begun to diversify its revenue sources by the time production of the commodities in question reaches a plateau. This might be only a few years in the future. If we look back at the IMF data for LNG in Box 2, it might be as early as 2030 in the case of Mozambique and LNG. Failure to achieve some serious diversification by that date would likely mean that spending norms—established during the period of buoyant extractive revenues—would become unsustainable. The problem is further complicated by the possible volatility of prices, which could either extend or reduce the date by which extractive revenues will reach a plateau. A diagram that stylistically represents the transition pathway to diversification is given in Figure 1 (the periods shown are purely illustrative and will be longer for some countries than for others).

Figure 1: Transition from depletion-led development to diversification



Source: adapted from Stevens and Mitchell (2008).

Given this analytical context, Sections 3.2–3.4 of this paper now drill down into some of the component areas of policy that together can contribute to an effective transformation pathway. What new production activities, services, jobs, and business opportunities can realistically be generated—and how—by using the boost from extractives as some sort of catalyst? As stated before, many different areas of policy are potentially involved in this.

3.2 Backward linkages and local content

Local content policies, whether they relate to the supply of goods and services or to the supply of labour, are often thought of as a device intended merely to gain as much local income as possible from some given extractive activity. This is a legitimate motive, but also an overly narrow and potentially dangerous one. If instead a government were to approach this issue using the framework (vision) of a long-term transformation strategy, then somewhat different policies and results would be likely to emerge. In particular, that long-term focus would remind the government that any new local content that was achieved would eventually (if not immediately) need to be commercially viable and saleable, even after the captive buyers in the extractive sector were long gone. In other words, *any artificial protectionism implicit in the local content policies would need to be purely temporary*.

However, two things are clear from those international experiences that are documented. First, many governments, including many in Africa, have preferred to establish formally mandated targets for local content (both for goods and services and also for labour and skills). In cases where those targets are legally enforced, they result in implicit protectionism of the local industries or labour. Second, there is emerging evidence that such local content policies can be harmful to the economy (see e.g., Kuntze and Moerenhout 2013; Stephenson 2013). Instead of merely instituting temporary infant-industry-type projections that will later be removed (an approach that characterized the industrial subsidies used in South Korea), these targets are liable to persist longer-term. They can therefore easily lead to large-scale rent-seeking—especially in the oil and gas sector, where expenditure tends to be more concentrated than in the mining sector on plant equipment ahead of production. The recent example of Petrobras is again relevant: newspaper reports there suggest that local companies were routinely asked for political contributions in order to become suppliers.

Mozambique's approach to this policy issue is still evolving, but the basic features of this approach are already established. These are summarized in Box 7, which is derived mainly from a recent detailed case study by the OECD (2017a). A more recent and deeper examination of this policy approach is set out in an unpublished paper by Dietsche and Esteves (2018). They note that

although the government of Filipe Jacinto Nyusi in late 2014 announced the drafting of a sector-specific local content bill, the approval of a sector-specific local content bill is still pending. This legal situation notwithstanding, they note that there is already a myriad of policies, strategies, plans, laws, and regulations in place that in various ways influence the local content requirements placed on extractive companies—requirements that can arguably be said to create an atmosphere of some confusion for the companies.

Box 7: Features of Mozambique's local content policies

The main features of local content arrangements are spelled out in two places: (i) the 2014 Mining Law and (ii) a number of individual MDAs.

(i) The 2014 Mining Law (Law 20/2014 of 18 August) requires that preference be given to Mozambican individuals or entities for the purchase of goods and services. For large purchases whose value exceeds an amount determined in subsequent regulations, firms must use a tendering process. However, it is understood that no numerical targets are specified to define the nature of the 'preferences' that are expected. The law further requires mining firms to ensure the employment of a local workforce when competencies are available, and to provide professional training of Mozambican workers; it also establishes criteria/limits for the hiring of foreign workers.

(ii) There are a variety of different provisions in the MDAs applied to different companies. However, the 2014 law stipulates that all mining contracts must contain certain mandatory clauses. These include clauses specifying minimum levels of local content and required ratios of local employment and training.

Additionally, Dietsche and Esteves (2018) refer to:

- the Policy and Strategy for Mineral Resources (Resolution 89/2013 of 31 December) and the associated Implementation Plan (Government of Mozambique 2017), which contains several additional local content references
- the Oil and Gas Law, which stipulates the requirement for companies to offer certain references to local suppliers
- the Regulation for the Contracting of Foreign Citizens in the Petroleum and Mining Sectors (Decree 63/2011 of 7 December), which sets out certain foreign employee quota limits
- The Natural Gas Master Plan of 2012, which sets out certain indicators for micro, small, and medium enterprise development around the value chain of oil and gas projects to guide their evaluation

The OECD (2017b) assessment is that, notwithstanding these arrangements, progress in achieving higher levels of local content (both goods and services and also labour) has been hampered by several main factors, including:

- the basic weakness of Mozambique's private sector, characterized as it still is by a large informal sector, many micro enterprises, and a generally thin manufacturing base
- a very poor endowment of skills and labour force capabilities, long years of war having drained the country of its workforce and weakened the educational system, bringing about serious insufficiencies in training in the workforce—hence the importance of lots of vocational and technical training, as well as a stronger primary-level basis of education
- serious constraints, not least access to finance, facing most small and medium businesses that aspire to grow their business volumes—thus well-intentioned large extractive companies such as Rio Tinto and Vale Brazil find it difficult to find the mass of suppliers that can deliver on larger contracts
- a lack of clear definitions of 'local content': a 'local company' is defined as any company registered in Mozambique, and this has meant *inter alia* that investment from foreign firms, such as South African firms, can be regarded as 'local' even though it does not necessarily foster the development of Mozambican indigenous firms[40]

Östensson (2017) has also addressed the possible confusions in local content arrangements by examining some of the unintended consequences of certain mandatory local content requirements

[40] This is a problem that is also well documented for the case of Zambia: see ICMM (2014) and Kasanga (2012).

as they have been experienced in other countries. He argues that overly rigid local content policies carry an undoubted economic cost and can come at the expense of other income. For example, they may raise project costs by significant amounts, thus undermining project economics while at the same time diminishing the country's standing as an investment destination. As is the case with the unilateral tax rate hikes discussed in Section 2.4, they may also have the Laffer curve-type consequences of reducing the government's own long-term revenue from taxes, royalties, and other revenues.[41]

However, it is not difficult to understand the position of the governments of low-income and mainly agrarian economies—such as Mozambique—as they seek to find ways to boost local content. In the short term, the scope for increasing local content, especially in such countries, is commonly constrained by the low capacity of potential suppliers, low skill endowments, and a number of other factors constituting the general business environment. Hence the legitimate ambitions of host governments confront the harsh realities of a thin economic (and especially industrial) structure. The difficult lesson from international experience, as expounded by Östensson (2017), is that in such countries there is often a great deal of knowledge of exactly *why* rates of business start-ups and supply responses more generally are so relatively weak. The causes include the generally poor climate for doing business, the numerous additional constraints that confront small and medium businesses, the weaknesses of credit availability and costs, inadequate infrastructure, numerous disincentivizing weaknesses in the regulation and taxation of businesses, etc. Much of this litany certainly applies in the case of Mozambique, and there is considerable detail on the specific areas of difficulty in the series of surveys conducted over several years by UNU-WIDER, the most recent in 2017 (see e.g., UNU-WIDER 2018a). This being the case—and given the long-term vision referred to above—it may be much better to develop systematic programmes to address these business climate constraints than to reach for the apparently easier device of fixing local content targets.

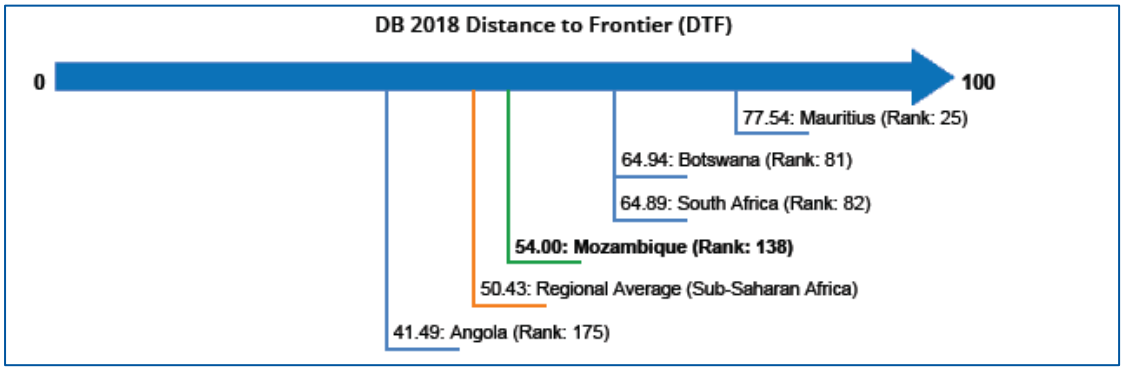
The merit of this suggestion (at least as an idea for serious debate) is given credibility by Mozambique's still quite poor ratings in terms of most of the dimensions of Doing Business as assessed annually by the World Bank. Figure 2 shows Mozambique's Doing Business profile for 2018 against those of some other African economies. We see that Mozambique now ranks 138th out of 190 countries and lags a significant way behind both South Africa (82nd) and Botswana (81st), but ahead of Angola (175th). In terms of the three component indicators[42] 'getting credit', 'getting electricity', and 'enforcing contracts', Mozambique ranks only 159th, 150th, and 184th respectively, and is still very far distant from the best-practice frontiers, in spite of some improvements in all three areas in recent years.[43]

[41] However, we also note that such effects are more likely in the case of mandated local content rules for goods than they are for similar rules applied to labour.

[42] There are 10 component indicators in all.

[43] The Doing Business product of the World Bank has been criticized from several different angles, and political bias has been alleged in some of those criticisms. But a number of technical weakness have been corrected, and it remains an important source of comparative information on those areas which it seeks to cover. See e.g., Newman et al. (2016).

Figure 2: Doing business 2018: how does Mozambique compare?[44]



Source: World Bank (2017).

Alternative approaches

Östensson (2017) and Kayizzi-Mugerwa and Anyanwu (2015) discuss another alternative policy approach that also avoids the mandated/targeting approach. Östensson exemplifies this with the cases of Chile and Norway, where policies have focused more particularly on improving skills and raising the capacity of domestic industry to qualify as suppliers to the extractive industry. While these policies have certainly resulted in some additional short-term costs to the extractive companies, they have been acceptable to most enlightened companies, because they have been operated in such a way as to encourage the credible view that the local companies will eventually graduate to become fully qualified partners and suppliers. In other words, it is an approach that solves a problem for companies (most of whom would rather procure locally) as well as governments. This focus on building capacity is also important to the transformation agenda which we earlier argued to be critical to successful longer-term development. This is because skills and other capacities can often be applied outside the extractive sector, and so can still find significant uses once the plateau of extractive activity has been reached and passed. For example, the construction industry currently accounts for only two per cent of Mozambique's GDP. But there will be a huge surge in new construction activity as the building of the LNG trains, ports, associated roads, etc. begins to take off. The skills that can be developed in this period can certainly be adaptable for other uses such as house-building once the LNG surge is over. This more voluntary approach would thereby appear to provide additional resilience to the national industrial fabric, rather than locking local companies into a perpetual dependence on the extractive industry alone.

It is an approach that sits well with an increasing number of experiences of good supplier development programmes initiated, financed, and at least partly managed by large extractive companies. Several of these as they apply in other LICs and MICs, including Ghana, Liberia, and South Africa, are usefully summarized in OECD (2017b). Other examples are given in ICMM (2010). Mozambique has already established an embryonic tradition in the area of fostering partnerships with local companies. The starting point for this was probably the MOZAL investment of the late 1990s. The OECD (2017b) summary of the associated partnership arrangements is reproduced in shortened form in Box 8.

[44] 'Distance to frontier' measures the distance of each economy to the 'frontier', which represents the best performance observed on each of the indicators across all economies in the Doing Business sample since 2005. An economy's distance to frontier is measured on a scale from zero to 100, where zero represents the lowest performance and 100 represents the frontier. The ease-of-doing-business ranking of countries ranges from one to 190.

Box 8: The MOZAL partnership arrangements[45]

- In 2001, a small and medium enterprise (SME) empowerment linkages programme (SMEELP) was jointly put in place by MOZAL, the Centre for the Promotion of Investment (CPI), and the International Finance Corporation (IFC) to develop local firms so they could become eligible to participate in the construction of the MOZAL plant. The project first created a database of potential Mozambican firms that could supply the company with goods and services. In order to allow small firms to bid for contracts, MOZAL redesigned and unbundled a number of its large contracts and reformulated its procurement standards. The firm further facilitated local firms' participation by providing information, and by training and mentoring potential SME bidders. In total, 16 SMEs were trained, and over time 28 contracts worth just over US$5 million were awarded.
- From 2003 onwards, when MOZAL moved into the operational phase, SMEELP focused on providing access to finance to SMEs, and on providing technical capacity training (the so-called Mozlink programme). In 2005, an industrial park was created to enable firms to benefit from clustering effects.
- From 2006 onwards, Mozlink was expanded (Mozlink II) to include other foreign investments, primarily in the gas (SASOL) and beverage sectors (Coca-Cola and South African Breweries). Supply chains programmes were developed to strengthen the business and technical capabilities of SMEs so they could compete for industry contracts in the wider economy.
- Overall, the different phases of the project are estimated to have created over 200 suppliers of inputs in sectors such as metallurgical services, transport, auto-mechanical and electrical products and services, construction, security, cleaning, catering, and laundry. Furthermore, with an investment of about US$1 million by the IFC and partner corporations, the programme facilitated US$53 million in incremental sales for local SME and US$15 million in contracts signed by SMEs, and created 336 formal jobs (USAID 2012).

Source: adapted from OECD (2017b).

It is understood that other similar arrangements have subsequently been attempted, not least by Rio Tinto and Vale Brazil, but with relatively disappointing results—in the case of Vale, because of the withdrawal of the IFC from its planned investment in the Vale coal project. However, the potential clearly exists to further develop the tradition of partnerships for suppliers' development that the MOZAL model has initiated. Some international firms, notably Vale, themselves have a long and successful track record in this area of work in their own countries.[46]

A reasonable conclusion to this section might be that Mozambique would be well advised to pursue a two-pronged approach to the question of local content and backward linkages. First, in addition to the relatively open-ended but specific provisions of its 2014 Mining Law, it would be helpful to accept Östensson's proposition and mount a broad-based attack on the several weaknesses that together contribute to Mozambique's relatively poor climate for business (summarized in Figure 2). Second, this might be combined with a concerted effort to build on and improve the methods that have already been applied with some success to extend the scope of supplier development programmes of the type used by the MOZAL project and summarized in Box 8.

3.3 Forward linkages

Östensson and Löf (2017) examine a range of issues around the topic of the downstream integration of extractive industries. This is a topic that has traditionally been seen as a central objective of mineral and energy policy because of the potential value-additions that are commonly expected to accrue from downstream processing, avoiding the alternative of allowing that value-

[45] See also Goode (2009) and Jaspers and Mehta (2007).

[46] This is spelled out in detail in ICMM (2012b).

added to be appropriated by other countries. However, outcomes in this regard have often been disappointing, and there are certain generic explanations for this.

Downstream processing may seem to offer an inbuilt advantage (to the home producer) because of the significantly lower transport costs when exporting compared with the export of the unprocessed commodity. However, almost all other factors weigh in to offset that advantage. These other factors include the absence (commonly) of the necessary economies of scale, the poor availability of key inputs including some skilled labour needed for processing, the limited size of the domestic market, the often long distances to export markets, and the lack of a favourable business climate. Once again, much of this litany of issues has relevance to Mozambique. Trade barriers such as escalating tariffs, which have often been cited as a major problem, appear to play only a limited role, particularly when we take account of the preferences now accorded to developing countries under various international trade agreements (Östensson and Löf 2017).

Östensson and Löf's in-depth analysis of three metals—aluminium, copper, and iron ore/steel—shows that the degree of vertical integration varies both *within* the extractive industry and also *between* the three metals studied. In all three cases this appears to be driven more by production economics—influenced by technological factors and transport costs—and less by corporate strategies or trade policies. In general, high-income countries such as Australia and Sweden have not dominated downstream processing to the extent that might have been expected. It would certainly be technically feasible for such countries to increase their own downstream processing. The fact that they have not done so would appear to argue that the attraction of downstream integration claimed in so many developing economies is not as self-evident as is often assumed.

For the bauxite/alumina/aluminium complex, access to low-cost energy is a major determining factor, along with an advantage for aluminium smelters that are located close to markets. For copper, the transport cost for copper concentrate has meant that copper is most often smelted and refined close to the mine. In the case of iron ore, developments over the past two decades have been dominated by the dramatic expansion of steel use in China, which has provided Chinese steel mills with a competitive advantage based on location. As regards processing margins, the available evidence suggests that these do not appear to have followed any particular trend in the past two decades. The surge in Chinese processing of all three metals could have been expected to change price behaviour. But this has not in fact happened.

But what can be said about different policy approaches? Östensson and Löf assess the main policies that have been adopted in four country cases (three mining-based—India, Indonesia, and Zambia—and one energy-based—Tanzania) in efforts to stimulate greater levels of downstream activity. The examples presented demonstrate several of the inherent practical problems that can arise when policies to actively promote downstream processing are adopted, as they have been in each of those four country cases. A common factor in all four cases is that *only limited analysis appears to have been undertaken to justify the policies eventually pursued: instead there has been a maintained assumption of significant benefit from the downstream activity, and political imperatives thereafter have driven the policy agendas*.

However, on a more positive note, Jourdan (2016) examines what he terms 'strategic mineral value chains', which he argues can be leveraged effectively (particularly in coherent regions such as Southern Africa) by recognizing the demand for some extracted commodities (such as iron/steel or plastic) as feedstock into strategic sectors essential for economic growth in other countries as well as to promote domestic/regional industrialization. Jourdan's regional mineral value chains illustrate a significant range of potential areas for downstream activity in Mozambique. These include (i) the links from phosphates and nitrogen to fertilizers and from there to agriculture; (ii) the links from cement to infrastructure of various sorts (roads, water etc.); (iii) the links from oil and gas to various types of power delivery; and (iv) the links from ferrous metals, oil, and coal to

iron and steel, and from there to various metal engineering industries as well as infrastructure. The Mozal example described in Box 8 above shows how this can indeed work out in the Mozambique context in sectors such as metallurgical services, transport, auto-mechanical and electrical products. However, to realize that sort of potential more fully there is an evident need for strong levels of coordination between the relevant layers of policymaking, high levels of relevant investment in both the commercial activities (private sector) and the supporting infrastructure (partly public sector), and above all a hard-nosed realism about which investment projects are commercially worthy of support (vide the Botswana practices noted above).

On a similar note, Roe (2017b) documents the strong benefits that have been achieved since 2015 in Tanzania by using its early-stage gas finds in the Indian Ocean (specifically at Mnazi Bay) not only to boost total electricity generation, but also to save a significant fiscal subsidy by switching to the lower-cost gas feedstocks.

On a practical point, a number of contradictions (unintended consequences) have resulted from the approaches to downstream policies in other countries. An important one is the political tension/power struggle between the companies producing the extracted raw material and those engaged in downstream activities. Indian policy with respect to iron ore-mining provides a good illustration of the difficulties of achieving a sound balance between the interests of primary producers and processors. In particular, export restrictions introduced in 2009 and designed to protect the downstream steel industry's raw materials supply have had the unintended consequence of seriously jeopardizing the viability of the Indian iron ore-mining industry. Östensson and Löf (2017) conclude that the Indian policies of recent years have succeeded in badly damaging a once-successful export industry, while leaving the downstream steel industry in an uncertain situation with regard to its raw material supplies. Recent developments in Tanzania have shown similar policy tensions between the new, emerging industry of natural gas and the older, established activity of coal-mining. This has served to weaken the financial viability of other industries, such as cement, which can use both resources (see also Roe 2017b).

Overall, it would seem to be reasonable to conclude that the presence of raw material resources in a country constitutes only one of the factors that should influence the policy decision to encourage the in-country location of any particular downstream plant. The incentives and directives that are typically part of such encouragement represent merely one variation on the familiar theme of picking winners. The evidence presented in the literature suggests that it is only too easy to make poor decisions in this area and to lose sight of some of the deeper underlying factors that can help to produce a more sustainable industrialization based on extractives.

3.4 Sharing infrastructure

One of the chronic needs of LICs such as Mozambique is for more and better infrastructure: their deficits in relation to roads, railways, ports, power generation, water supplies, and telecommunications are huge and very well documented. But relatively little mentioned in this context are the very large absolute amounts that the large extractive companies themselves spend on infrastructure of one sort or another—often roads, power generation, rail systems, and ports. There is arguably great potential for this investment to be better integrated with national systems so as to take some of the pressure off public spending on the same sorts of facilities. Östensson (2017) reviews some of the relevant literature on this important topic. Östensson and Roe (2013)

describe one particular success story, namely the huge Tenke Fungurume copper mine in the Democratic Republic of the Congo, which gives an indication of the potential.[47]

The more general point here is that infrastructure that is built for extractive industries can often be used by local populations and for other economic activities, and can thereby help to position a region for more rapid economic development and diversification. In short, large extractive investments can be used in this respect as the catalyst for broader regional development—a potential that is all too often passed over. The planning requirement for success is that mine- or oil-and-gas-related infrastructure should be planned and built while other economic activities and local opportunities are taken into account.

In this broad context, the concept of a 'mineral resource corridor' has attracted increasing attention (World Bank 2012). The Maputo Development Corridor launched in 1996 is one of Mozambique's great successes—perhaps the best-known and most successful example of such a corridor. 'This provides the shortest road and rail connection between the Gauteng, Northwest, Limpopo and Mpumalanga provinces of South Africa and Gaborone in Botswana and a deep-water port in Maputo' (World Bank 2012). As well as building specific pieces of infrastructure—railway links, a single toll road, a rehabilitated port, telecommunication and electricity links—a number of newer industries have sprung up along the corridor. Examples include the world's third-largest aluminium plant, the MOZAL plant, developed near Maputo; the Pande-Temane gas field, with a US$1.4 billion pipeline to South Africa; and the Beluluane industrial park, a 600-hectare industrial free zone next to the MOZAL plant (see also Bek and Taylor 2001).

But Östensson also notes some of the constraints on the greater use of shared infrastructure, including resource corridors. In particular, he points out: 'public-private partnerships (PPPs) are central to the resource corridor concept since it requires both the government capability of establishing an appropriate regulatory framework and its convening power, as well as the large financial resources of the private sector' (Östensson 2017: 18). However, in practice there are few examples of successful greenfield multiclient/multiuser mining-related infrastructure PPPs globally. We are not aware of any in sub-Saharan Africa. One implication of this is that it is difficult to arrange financing. Another implication is that the large mining or oil and gas companies will most likely have to serve as anchor clients to these projects. A third implication is that donor agencies (especially those with a link to a development finance company, such as the United Kingdom's Commonwealth Development Corporation or the IFC) may be called upon to act as some sort of guarantor for the broader project.

[47] 'In Fungurume, Katanga, Democratic Republic of the Congo, population tripled within a few years to more than 100,000. This was the result mainly of Tenke Fungurume Mining, a mining company that operates a copper mine close to the town, improving the road to the provincial capital, thereby cutting the driving time from two days to four hours, and building a new market. The improved road made it possible for traders from other parts of the province to reach Fungurume, thus increasing local supplies of consumer goods. It also provided local farmers with an outlet for their produce, allowing them to earn cash income. As a result, local incomes improved, the local food price inflation that is often associated with large mining projects was kept in check' (Östensson and Roe 2013: 17).

4 Social and community issues

4.1 Policies for local communities

In the past two decades, issues relating to the mitigation of harm and the delivery of improved benefits to local communities have become an increasingly important component of the overall dialogue around the extractive industries. In early studies conducted by the ICMM (in the early 2000s), it was mooted that a core reason for the frequent discontent at local level is that the majority of the revenue and other benefits of extractives activity accrues predominantly at the national level, where typically they are concentrated in the hands of those in power and in capital cities. At the same time, the negative impacts of any extractives project are largely felt at the local level (e.g., disruptions in terms of population movements, noise, and air and water pollution). In parallel, potential local benefits in the form of new employment opportunities, improved services, etc. often disappoint in terms of their magnitudes, even in countries such as Brazil, Ghana, and Peru, where explicit revenue transfers to local areas are in place.

Certainly, in many countries the idea has been established as the conventional wisdom—often with the help of active campaigning by concerned non-governmental organisations (NGOs)—that the net benefits of extractive activity to local community areas are much smaller than is hoped for, or are even negative overall once the harmful environmental and displacement effects are factored in. Such opinions, when they occur, are of course extremely damaging to the reputations of the large multinational companies against whom they are mainly directed. These companies recognize very clearly that their social licence to operate is put at risk as long as such negative attitudes persist. Not surprisingly, there has been a concerted effort by those companies, their representative bodies (such as the ICMM for mining, and the International Petroleum Industry Environmental Conservation Association (IPIECA) for oil and gas), and supporting government and donor agencies to design and implement better and more acceptable practices to ensure greater benefits to the local areas in which the extractive companies operate. The international experiences of the past two decades suggest that there are two mutually reinforcing ways to deliver an improved outcome at local and community level: a voluntary approach, and an approach involving legal mandates.

Voluntary approaches

Catherine McDonald (2017) reviews the extensive literature of the past 45 years that describes but also substantially critiques the conventional corporate approaches labelled 'corporate social responsibility' (CSR). That literature recognizes that a gradual shift has taken place in corporate arrangements, moving from those based narrowly on a CSR approach to broader-based approaches that recognize the need to maintain a 'social licence to operate'.[48] Most large mining companies, she explains, now understand quite well the importance of locally designed and managed programmes, with community members at their core participating fully in both design and implementation. A parallel discussion of the more slowly emerging attitudes amongst the large oil and gas companies can be found in a paper by Kathryn Tomlinson (2017). Those attitudes, she explains, originated in large part as a response to the widespread criticism of the oil and gas majors

[48] As Dodd et al. (2015: 11) outline: 'Social licence to operate is a much broader concept than social performance. […] Although a company may have been granted a formal legal licence to explore, develop or produce resources in a particular geographical area, this does not necessarily mean that this legal right is viewed as legitimate by stakeholders more broadly, or by some specific but (for various reasons) critical stakeholder groups.'

that was evident especially from the 1990s onwards (some of it linked to major disasters such as the Exxon Valdez oil spill in 1989).[49]

Against the background of a significant level of criticism of company performance evident in the literature, there have been very substantial efforts by international agencies such as the United Nations to establish some basic voluntary human rights standards for the industry, including notably the Voluntary Principles on Security and Human Rights (VPs) established in 2000.[50] This initiative received strong support from some major oil companies, notably Shell and BP, working with the United Kingdom and United States governments and various human rights NGOs. In parallel, the industry bodies have been active in the past two decades to achieve improvements. In particular, the two main industry bodies (ICMM and IPIECA), as well as international bodies such as the World Bank and IFC, have issued guidance publications on a wide range of community relations topics, including working with indigenous peoples and protecting human rights. ICMM and IPIECA in particular have both produced a large number of detailed toolkits and guides that give practical advice about how to enhance company-community relationships leading to sustainable development outcomes.[51]

One prominent example can help to illustrate the types of guidance that a country (and its extractives-affected communities) might now expect to receive from at least some of the larger international companies. This is the ICMM Community Development Toolkit (CDT), which relates to 'sustainability'—the ninth of the principles enunciated as a condition for membership of the ICMM.[52] Although the guidance of the CDT is primarily targeted at mining companies, the authors anticipate that elements of its recommendations will also have relevance for government and local communities. For example, they suggest that the government of a host country might choose to modify some elements of its licensing rules in order to make it clearer where responsibilities lie for implementing some of the actions listed in the toolkit. The CDT (ICMM 2012a) offers valuable guidance about good practice in five specific aspects of community relations, namely:

- relationship tools: arrangements for identifying appropriate stakeholders, assessing their likely interest in any extractive project, developing arrangements for consultation, etc.

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[49] The criticisms levelled at the industry were—and still are—broadly based, covering issues such as allegations that oil wealth fuels corruption and conflict and props up repressive governments; suggestions that the companies are either complicit in or benefit from human rights abuses committed by host governments (e.g., the Shell Nigeria and BP Colombia cases); complaints about various negative impacts (such as oil spills and flaring) leading to environmental damage and health and livelihood impacts on local communities; and rising awareness of wider questions about the industry's (negative) role in climate change.

[50] The VPs initiative involves a tripartite multi-stakeholder group, currently made up of nine governments, 30 extractive companies, and 10 NGOs. As of 2016, all five major international oil and gas companies (Shell, BP, Exxon Mobil, Chevron, and Total) are signatories of the VPs, as well as several large to medium-sized international oil and gas companies.

[51] These are freely available. The main ICMM and IPIECA guidelines and toolkits both emphasize participatory planning involving communities as a foundation for successful community development programmes, among many other useful tools and methods.

[52] The ninth principle states that ICMM members are expected to 'contribute to the social, economic and institutional development of the communities in which we operate' (ICMM 2012a: 7). The work for this toolkit originated in 2005 in a joint project between the World Bank Group's Oil, Gas, and Mining Policy Division, the Energy Sector Management Assistance Programme, and the ICMM.

- planning tools: the processes of determining what the company hopes to contribute to the community, how it will resource that contribution, the methods of engaging and empowering the local stakeholders and internalizing their own priorities, etc.

- assessment tools: the definition of a baseline assessment for the communities affected, identifying the likely impacts of the project on that baseline (both negative and positive), and determining how best to manage these impacts through the life of the mine

- management tools: the establishment of organizational arrangements for the ongoing management of the community-company interface, including arrangements such as community development agreements, formal company management and recording systems, community action plans, and resettlement agreements

- monitoring and evaluation tools: the choice of indicators against which to monitor and evaluate progress, and the definition of a 'goal attainment scaling' system to help in the transparent presentation of the results of monitoring and evaluation to a broad audience—including many with no deep understanding of formal statistical systems

A similar set of guidance tools is provided in the 'Socio-Economic Assessment Toolbox' (SEAT) developed by the Anglo American corporation, which is acknowledged as the leader amongst the various mining company-specific frameworks (Anglo American 2008). Like the ICMM's CDT, SEAT provides the management teams of a company with tools designed to help them plan the full life cycle of an engagement with local communities, running through the whole spectrum from profiling the mining operation and its likely impacts *ex ante* to monitoring and assessing actual impacts *ex post*.

A general message for governments that emerges from international experiences of this sort of work is that it is often the extractives companies that have done more of the detailed ground-level work to develop and explain actual practices and procedures—including some good-practice arrangements. There are good reasons for this. Although host country governments have an interest in the same set of issues, their policies towards these issues are commonly subsumed in broader agendas relating to those same issues for their country as a whole. For example, it is relatively uncommon for governments to articulate detailed subpolicies (on for example healthcare or industrialization) specifically for mining-affected regions.[53]

It is known that many companies have incorporated these sorts of guidelines into their own operating manuals, and McDonald (2017) presents a number of examples where participatory approaches have resulted in apparently strong outcomes for local communities. But the author notes that although the concept of 'participation' is nominally widely embraced, it is not so widely understood or well used in practice. If communities impacted by an extractives project are poor and have little infrastructure available, then it may seem obvious that what they need will be schools, roads, clinics, jobs and other economic opportunities, etc. That is not the point. The point is that, in order for communities to become economically empowered and self-motivated about their future development, they need to be enabled to plan and chart their own destinies—possibly with the help and support of companies and other development agencies. McDonald documents some of the numerous examples demonstrating that what people assess as their own needs may be quite different from what 'experts' assume them to be.

[53] This point is developed more fully in Östensson and Roe (2013).

A country-specific paper on Zambia by Angel Mondoloka (2017) builds on the more general points raised by McDonald. He considers a number of organizational factors that help to explain the present (in his view unsatisfactory) situation in Zambia and that might, if amended, result in improved community development outcomes. One of these is the clear need for a systematic tripartite approach involving mining companies, government, and communities. However, he argues that several factors work against such an approach in Zambia. One is the attitude of local governments, who frequently regard CSR as a substitute/replacement for the government's own developmental responsibilities: 'if the company is doing something for a community, there is less need for us to do it!' Another factor relates to the role of civil society organizations. In a perfect world these would be ideally placed to act as trusted brokers between the three parties, owing to their strategic positioning in the dialogue space between them. But in reality, in Zambia those organizations have failed to achieve the necessary unity of purpose to enable them to fulfil this role. Mondoloka argues that another important gap in the Zambian system is the government's laissez-faire posture towards CSR and its unwillingness to legislate for such arrangements, a position that results in inconsistent CSR practices and weaknesses of accountability. We are not aware of how relevant some of these Zambian-specific comments may be for the Mozambique situation, but expect that some of them will be.[54]

Finally, on the voluntary approaches, the more enlightened approaches of some of the large companies' corporate players in the extractive sectors in recent years have opened up much greater opportunities for effective partnership arrangements involving various combinations of players, including governments (local and national), the producing companies, donor agencies, and NGOs. There are now many examples in the literature of both organizing frameworks and particular country case examples to evidence this potential. Once again the ICMM can claim some leadership role in this with its Mining Partnerships for Development Toolkit (ICMM 2011), which offers a range of advice about how such partnerships can be justified and organized. Some 30 different examples from some 20 different counties of how partnerships have been constituted, and the key factors that led to successful outcomes in many of the cases, are provided in ICMM (2010).

Mandatory approaches

James Otto (2017a) considers the competing cases for mandatory community development agreements (CDAs) versus voluntary approaches to community development. He acknowledges that although significant efforts have been made to develop workable codes of practice (such as the CDT and SEAT) for the voluntary approaches, it remains the case that relying on companies to voluntarily assist communities is risky: not all firms are good corporate citizens, and not all are competent to know how to offer such assistance. Further advantages of a legislated approach include the following: (i) the expectations of a community can be aligned to a practical level of funding; (ii) formal grievance and dispute resolution approaches can be established; (iii) extractives companies will know the minimum level of annual development funding that they must provide; (iv) the different roles and responsibilities of the companies, communities, and government will be clear to all parties. Partly for these reasons, many companies would agree that formal CDAs, whether required by legislation or not, can be a useful tool to help them manage community expectations. One possible disadvantage is that the mandatory approach can impose a large administrative burden on the regulatory agencies, which as Aubynn (2017)—a senior regulatory practitioner from Ghana—explains, can often find it difficult to recruit sufficient qualified staff.

[54] Some insights on this are available in Kaufmann and Simons-Kaufmann (2016).

At the same time, it is clear that the two approaches are not mutually exclusive, and also that hybrid approaches combining mandated elements and voluntary activities can work quite well.[55]

Otto (2017a) also identifies 43 countries whose mining legislation (his paper only covers mining) requires some sort of community development action and agreement. Such agreements go by many names: impact and benefit agreements, access and benefits agreements, indigenous land use agreements, partnering agreements, contracts with the community, landowner agreements, shared responsibilities agreements, community joint venture agreements, empowerment agreements, and benefits-sharing agreements. Some are intended merely as informal, non-binding arrangements whereby the signatories mutually express their views on certain topics, but others take the form of a legally binding contract or even a treaty. Otto argues that collectively these different schemas are becoming more widespread.

The increasing significance of legislated CDAs has been enhanced in the recent past by a 2010 initiative of the World Bank that led eventually to a set of modal CDA regulations and guidelines for governments, industry, communities, and other concerned stakeholders (see Otto 2010). Otto argues that where the CDA legislation is robust, it can provide a clear roadmap for mandatory processes, approvals, monitoring, and enforcement, all of which are lacking in an unregulated approach to mine-assisted community development.

4.2 Extractives revenues: improving education and health

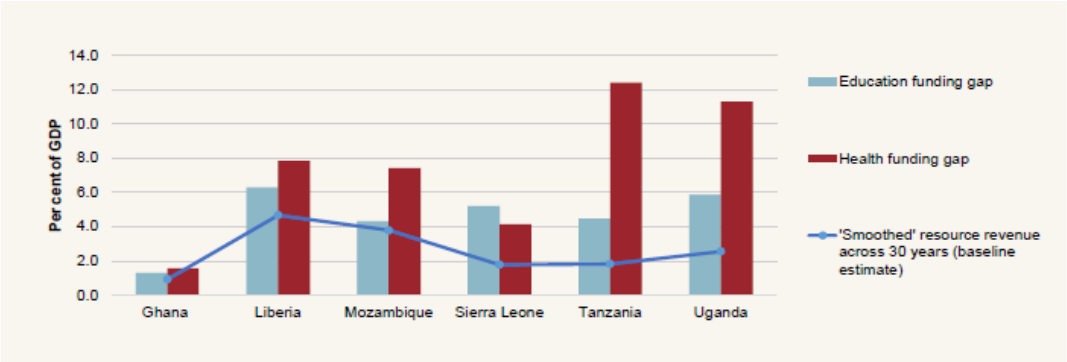
The huge additional revenues that may accrue for the development over time of Mozambique's new extractives resources could provide a one-off opportunity to improve Mozambique's still-poor provision of education and health services. The extent to which this will happen is of course partly dependent on decisions of the government about how it might allocate its available new revenues: it will face many demands on these revenues additional to those from the education and health ministries. However, some useful ballpark estimates on this matter have been provided for several countries in a series of papers for a flagship AfDB (2015) project funded by the Bill and Melinda Gates Foundation.

In one of those papers, Witter and Jakobsen (2017) calculate the size of the health and education funding gaps[56] of a number of new African extractives countries, including Mozambique, over the next several years. They then compare these gaps with the additional revenues from extractive resources that are anticipated for these countries (at the time of their research in 2014–15). The results are summarized in Figure 3.

[55] The best example known to me is that of Brazil, whose situation is described in some detail in ICMM (2012b) and Filgueiras et al. (2017).

[56] To estimate gaps for health, projected resource revenues were compared with: (i) national health expenditures, based on national health expenditure accounts data; (ii) funding needs, using international recommendations from McIntyre and Meheus (2014) and estimated health funding gaps; and (iii) other potential innovative health-financing sources. On the expenditure side, use was made of a financial programming framework for each country that enabled projections of key economic variables such as growth and domestic revenue, and these were then used to estimate resource availability for health.

Figure 3: Health and education funding gaps compared with smoothed natural resources revenues, annual averages 2016–25



Notes: It appears that health funding gaps are larger than education funding gaps. This is partly due to the differing methodologies used to calculate gaps, which is related to available data on current spend and estimated needs for each sector and country.

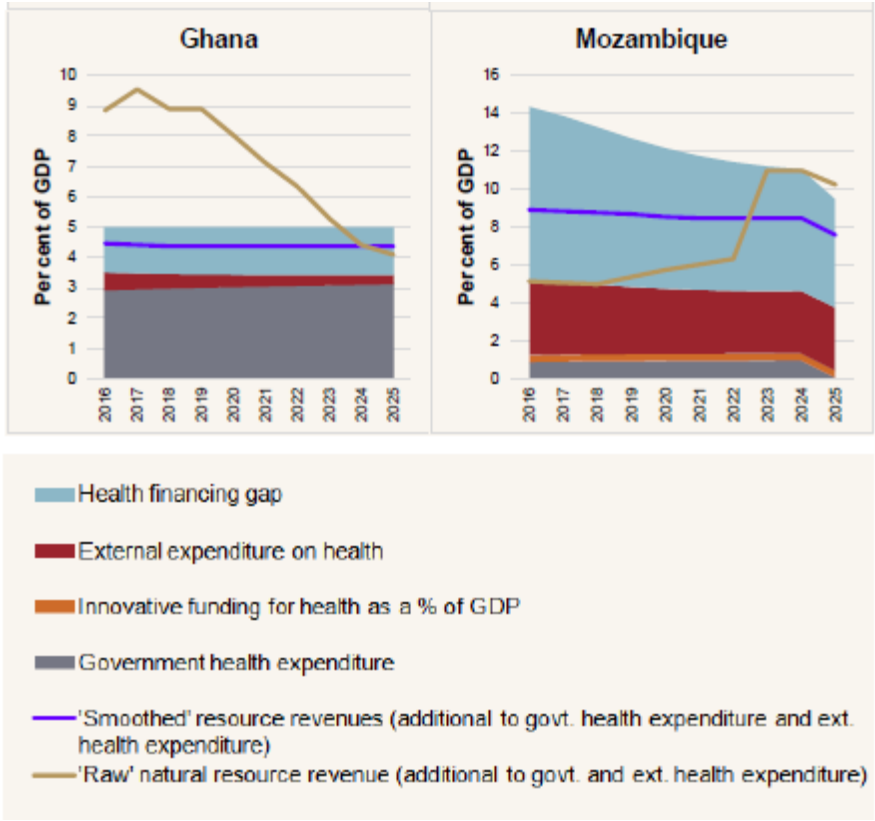
Source: Witter and Jakobsen (2015: 8).

The authors note (and Figure 3 evidences) that, assuming an LNG price of US$11 per million British thermal units, and with estimated projected revenues smoothed over the next 30 years, Mozambique, by committing most of its addition revenues to this, could fund most of its education needs, or around a third of its need for financing in health, over the next decade. Similarly, assuming a crude oil price of US$60 per barrel, Ghana could meet about a third of its combined health and education funding needs over the next decade. However, by using a 'low case' and less optimistic price assumptions, they also show that the contribution to health and education funding gaps could still be very significant. That contribution over a 10-year period varies of course in line with the over-time variation in expected revenues, shown in Figure 4 for the health sector for both Mozambique and Ghana.[57] But note also the very substantial size of the existing financing gaps relative to what the government is actually able to spend.

Research of the type conducted by Witter and Jakobsen also opens up a side question as to how extractive revenues differ in their characteristics compared with mainstream government revenues in terms of suitability for funding social services such as health. Witter and Jakobsen's answer to this question is summarized in Table 2.

[57] It must be remembered that the research underlying these results was undertaken mainly in 2014, when the start date of the major oil and gas projects was thought likely to be earlier than is now the case. Hence the years on the horizontal axis should ideally be adjusted by some four to five years—certainly for Mozambique.

Figure 4: Health sector financing gaps: profiles over time



Source: Witter and Jakobsen (2015: 11).

Table 2: Revenue characteristics and their implications for social-sector spending

Core characteristics of extractives revenues	Implications for social spending prioritization
1. Of medium-term duration (20–30 years)	Investments should create major additional costs only if projected growth rates suggest they can be maintained over the longer term
2. Non-renewable	The investments should benefit future generations as well as current generations
3. Of varying scale and time profile, with rapid scale-up in some cases	They should be capable of rapid introduction, and acknowledge the risk of potential scale-back
4. Volatile in amount and hard to predict, as extraction and world prices will vary over time and may be affected by shocks	Unless smoothing mechanisms can be found, the investments should focus on discrete interventions, such as systems strengthening and improved value for money, rather than recurrent costs
5. Associated with weaker accountability to the local or host nation populations	Some part should be focused on local communities who have also had the disadvantages of extraction

Source: Witter and Jakobsen (2015: 15).

Finally, as a practical matter, there is a framework of logic lying behind decisions about how best to allocate revenues to social sectors such as health and education that could be useful in the Mozambique context. This brings together what is known about new natural resources revenues, and also about the needs for funding, the systems constraints, and existing experiences across the social sectors, in order to assess what specific approaches are most likely to yield good results in low- and middle-income, often fragile, contexts. That framework is spelled out and illustrated for the cases of Ghana and Sierra Leone in Witter and Jakobsen (2015: 31–33).

5 Final words

The management of extractive resources is a complex and multifaceted task. If done well, it will push the limits of the skills and capabilities of almost all ministries of a country and a large variety of other executive agencies as well: NOCs, SWFs, taxation authorities, etc. The set of challenges facing Mozambique over the next few years is particularly daunting because of the sheer scale of the combined resources of gas, coal, and various minerals that seem likely to be exploited. There is a huge literature dating back to the 1980s that will tell countries such as Mozambique of the multifarious reasons why failure is possibly more likely than success: the resource curse literature—broadly defined—is alarming in terms of the numbers of things that can go wrong.

The good news is that in the past two decades there has been a generally more optimistic slant on this, and some genuine expectations that with good policies and institutions an extractive resource, far from being a curse, can indeed be an agent of change to help produce accelerated and sustainable growth. Indeed, in the new literature on industrial policy there is now deep scepticism that LICs such as Mozambique can replicate the manufacturing export-led growth that created so much transformation (including fast growth and significant poverty reduction) for many of the East Asian economies such as China, South Korea, and Taiwan. Gains in manufacturing productivity have been so large globally, and the international competition is now so fierce, that success in this area—even if achieved—is unlikely to provide the growth in job numbers that Mozambique and similar countries seek. Specialists in this area such as Stiglitz now speak much more about multisectoral drivers of economic transformation, with the extractive sectors in some countries at least being an important part of that.[58]

The present paper has examined the literature and selected international experiences across a wide range of the component issues that need to be considered as Mozambique formulates and delivers its strategy for sustainable development based—at least initially—on the new extractive resources that are available. Four main points must be stressed in these final words. First, *there is no proven formula for success*. In none of the many component areas of policy that we have discussed would we suggest that there is an 'off-the-shelf' approach that can merely be appropriated without some adaptation for use in Mozambique. Mozambique is a distinct country with its own unique characteristics: international experiences can serve only as a guide to aid the analysis needed to identify and then establish the Mozambican policy package.

Second, the most important lesson of the paper is that *depletable extractive resources should be seen as an opportunity to establish a new transforming growth path, and not as the long-term determinant of that path*. The concept of a plateau that marks the end of a 'deletion-led development' stage is very important (see Figure 1). Long before that plateau is reached, a range of policies and initiatives need to be in place to ensure that the revenues and expenditures made possible by the extractives sectors have been used in part to stimulate the various other non-extractive productive activities—including some based on agriculture—that can go on to sustain growth once the depletion-led phase is over.

Third, in considering the numerous policies to achieve this structural transformation, *the government should avoid the mistake of thinking merely in terms of the revenues that they themselves command by taxing (or extracting other revenues from) the extractive industries*. It is now very well documented that within the totality of annual direct spending by the extractives industries, the element available to government is typically only around 15–20 per cent of the total for mining and 30–40 per cent for oil and gas,

[58] Other WIDER projects have addressed this matter from a number of perspectives, including several papers under the umbrella of 'Learning to compete'. See for example Cruz et al. (2017) and UNU-WIDER (2018b).

the differences depending on the quality of the tax regime and collection rates. The much larger proportion of direct spend by the companies is on wages, supplies, infrastructure, and social spend: 50–66 per cent of the annual total for mining, and 40–51 per cent for oil and gas (see AfDB 2015: 32). The evidence further shows that the direct spend by companies is typically augmented by a range of multiplier effects arising from (i) the spending of moneys received by suppliers and (ii) the spend of typically well-paid mine or oil and gas employees. These multipliers in combination, even in agrarian societies such as Zambia, can be over three times the direct spend, and will be significantly larger than in countries with deeper industrial sectors (see e.g., ICMM 2014; Round and Roe 2017). So overall, the direct and indirect spend that is *not* under the control of government could be nine or 10 times bigger than the funds that the government itself controls. It is obviously important to achieve full corporate compliance with the established tax codes of a country (i.e. to take all available steps to avoid tax evasion, as discussed in Section 2.4). But these numbers suggest that it is quantitatively even more important to frame policies to ensure that the much larger private spending (direct and indirect) is a real force to contribute a stimulus to new non-extractive production, including some in agriculture. One pertinent example is that of providing systems of support to agricultural and other micro, small, and medium enterprises in mining districts to ensure that the spending of mining employees does indeed create additional production and incomes in those areas. More generally, the fostering of supplier development programmes of the types pioneered by the MOZAL project is a low-cost way for governments to achieve even larger multipliers.

Finally, although this paper has been presented as a set of separated themes, *the institutional arrangements in government and beyond need to be thought of as inherently interlinked*. There is no room in a successful strategy for extractives for a number of different silos of policymaking: on the contrary, it is crucial to develop and maintain a coordinated approach across all relevant agencies of government and their interactions with companies and other non-government players.[59] Mozambique has made a good start on this with its 2012–13 Gas Master Plan[60] and the subsequent appointment of a broad-based steering group of 12–15 ministries to give guidance to the technical work supporting the plan. However, this initial commitment to an 'all of government approach' needs to be deeply embedded in future strategizing, policy development, and policy implementation across all of the areas that this paper has considered.

[59] This point is developed in detail in a paper on an 'all of government approach' by McPhail (2017).

[60] Developed by ICF International supported by the World Bank.

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