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Mozambique—bust before boom

Reflections on investment surges and new gas

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Abstract: This paper is a sequel to an earlier paper that looked in broad terms at many of the issues that Mozambique faces today in managing its new extractive resources. The paper first describes the investment surge that has already been prompted by new gas discoveries in Mozambique. It then summarizes some of the more recent literature that has examined the effects of such surges in other country contexts. It next examines the main aspects of the disappointing economic outcomes that have so far been seen through 2018, and selectively analyses some of the implications of these outcomes for future policy. The paper concludes by exploring the epidemiology of a large public investment surge—an issue that has relevance for the further surge that is still anticipated. In following this sequence of argument, the paper also throws light on a number of critical general policy questions that arise in the context of major new resource discovery.

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

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1 Introduction

This paper is a follow-up to an earlier paper that looked in broad terms at many of the issues that today face Mozambique—a country that is expected to shortly benefit from very large volumes of new natural gas discoveries (Roe 2018). The present paper drills down more narrowly into the issues that arise from the investment boom that has already been associated with major new discoveries of extractive resources from 2009 onwards. In the interests of continuity with previous works, Box 1 summarizes the more important aspects of the new Mozambican discoveries and indicates the broad orders of magnitude of the volumes that may flow from these.

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 2009–11, and the plans to develop these are still underway. 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).¹ Their total investment costs, estimated at around US\$100 billion, would make it the largest investment project in sub-Saharan Africa. Smaller discoveries in 1957 (Temane) and 1964 (Pande) in the southern Pande–Temane fields had earlier opened the way to Mozambique's gas production. However, these fields were largely stranded until 2013, when they were acquired by Sasol of South Africa. They are now part of a Southern Africa integrated gas project that also involves ownership stakes for Sasol, Companhia Moçambicana de Hidrocarbonetos SA (CMH) (25 per cent), and the International Finance Corporation (IFC) 5 (per cent). 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 the IMF (2016a)) 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 date to be revised. The situation as we understand it today is as follows:

- Anadarko is committed to build a liquefied natural gas (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. This was approved by the government in early 2018 and a final investment decision is expected in the first half of 2019, after completion of binding sales agreements. The Area 1 consortium initially plans to construct two onshore liquefaction trains which will have the capacity to produce over 12 million tonnes 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 five million tcf in its first phase alone.² Its board approved the investment plan for this in 2017. 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 the liquefaction facilities onshore.
- Total (France) has concluded its production sharing agreement (PSA) with the 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.

Source: Roe (2018).

¹ 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.

² Total reserves are estimated at 15 tcf.

This paper is structured as follows. Section 2 briefly describes the investment surge that has already been prompted by the new gas discoveries in Mozambique. Section 3 summarizes some of the more recent literature that has examined the effects of such surges in other country contexts. Section 4 then looks at some of the economic numbers that have been attached to the likely boost to Mozambique's economic activity as a result of the huge volumes of new gas production that seem possible. Section 5 describes the main aspects of the disappointing economic outcomes that have so far been seen through 2018. Section 6 selectively analyses some of the implications of these outcomes for future policy. Section 7 concludes the paper by exploring the epidemiology of a large public investment surge—an issue that has relevance for the further surge that is still anticipated. In following this sequence of argument, the paper throws light on a number of more general questions that arise in the context of this volume. In particular: how well prepared are the authorities to deal with the revenue volatility associated with their resource wealth? Has public sector project selection been cognizant of the nature and time horizons of natural resource revenues? And is public expenditure management more generally well-oriented to manage those resource revenues?

2 Mozambique's investment surge post-2010

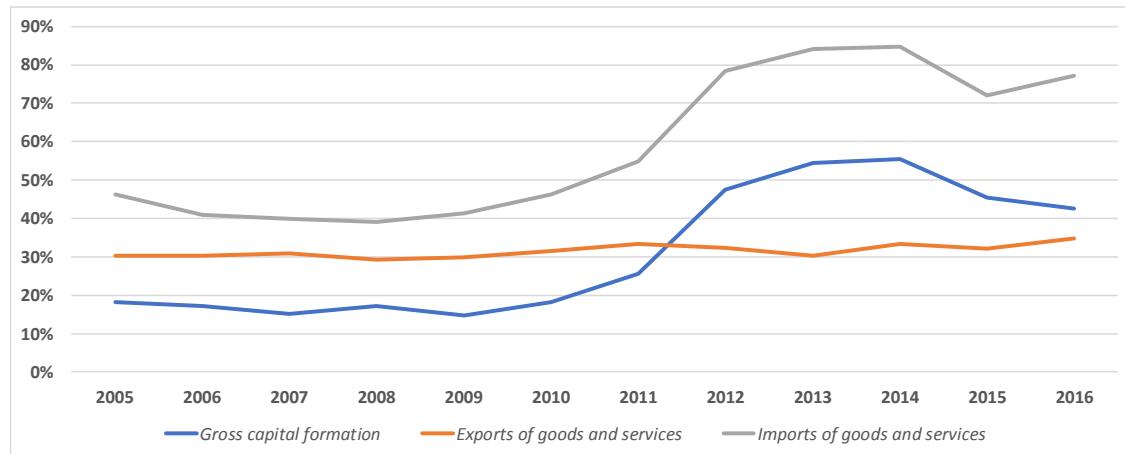
First, what do the data show? National accounts data (Figure 1) for the period from 2005 through 2016 clearly indicate the unique nature of the period after 2010. Prior to that, the investment share of gross domestic product (GDP) in Mozambique had typically hovered at or below 20 per cent of GDP, with much lower figures in the years prior to the 1992 peace settlement, when the investment share fell as low as 3–5 per cent (mid-1980s).³ By contrast, in all five years of 2012 through 2016, the investment share of GDP was well in excess of 40 per cent. Recent IMF projections suggest that even higher investment rates may be seen through 2019 (see below). This big change was associated mainly with a strong surge in foreign direct investment (FDI) arising from the initial outlays for the LNG developments described in Box 1. Arezki et al. (2017) describe Mozambique's natural gas discoveries in the Rovuma basin since 2009 as nothing short of prolific, with a discounted net value around 50 times its GDP.⁴ The massive improvements in Mozambique's record of attracting FDI after 2010 reflects this very bullish assessment.⁵

³ But it occasionally exceeded 30 per cent in a few later years as particular mega-projects were developed.

⁴ Data from UNCTAD's World Investment Reports show the volume of annual FDI rising almost tenfold from only US\$600 million in 2008 to US\$5.6 billion in 2012 and to US\$6.2 billion in 2013 (UNCTAD 2016: 197). Even by 2013 the total stock of FDI was estimated at almost US\$21 billion (UNCTAD 2014), a 400 per cent increase over the 2010 level. By 2017 this had risen to US\$38.0 billion, in spite of the decline in new annual flows in all years 2014–2017 (US\$4.9 billion, US\$3.9 billion, US\$3.1 billion, and US\$2.3 billion, respectively; UNCTAD 2018: 185). So, in spite of recent difficulties, Mozambique is still positioned as the third largest country in sub-Saharan Africa in terms of its FDI assets, behind only South Africa (US\$150 billion) and Nigeria (US\$98 billion).

⁵ Given the huge surge in FDI prompted by these discoveries, there was a parallel surge in the country's import bill, which rose from the equivalent of 46 per cent of GDP in 2010 to well over 70 per cent in the five years from 2012 (also shown in Figure 1).

Figure 1: Investment shares of GDP, 2005–16



Source: Author's illustration, based on data for Mozambique from the United Nations Statistical Office at <https://unstats.un.org/unsd/snaama/resQuery.asp>.

In a recent detailed analysis, Toews and Vezina (2017) assessed the relationships between the initial and large surge of FDI associated with the gas discoveries and the further FDI that has been attracted to Mozambique as a consequence. Specifically, using a project-level FDI data set compiled by fDi Markets,⁶ they find across countries in general, 'that in the 2 years following a large discovery, non-extraction FDI inflows increase by 58%, the number of FDI projects increases by 30%, the number of sectors targeted and of source countries increase by around 19% and the number of jobs created increases by 54%' (Toews and Vezina 2017: 3).⁷ In short, an FDI surge based on extractives generally results in a parallel boost to non-extractive FDI. The underlying hypothesis based on earlier research by Alfaro and Charlton (2013) is that the development potential of FDI is mostly associated with quality FDI in the non-extractive sectors (especially services and manufacturing) rather than in the extractive industries themselves. This point was elaborated in my earlier paper (Roe 2018: section 3), but there related to the imperative in Mozambique to use the opportunity created by extractives to catalyse broader structural developments.

Applying the general result from Alfaro and Charlton (2013) to Mozambique and using the fDi Markets data, Toews and Vezina (2017) suggest that foreign firms did actually move in quickly after the first gas discoveries in 2009–10, and in a multitude of industries, creating around 10,000 jobs in the following three years. They suggest that in 2014 alone total FDI could have amounted to as much as US\$9 billion—which accounts for almost the whole of the national income investment figure reflected in Figure 1.⁸ Their results further suggest a substantial *employment multiplier* associated with the flow of FDI (~6.2 times the impulse from extractives). In terms of the impacts at the *sectoral level*, they suggest that the largest FDI contribution to formal sector jobs has been, in order of importance, services, manufacturing, agriculture, transportation, and

⁶ Part of the Financial Times Group; see fDi Intelligence (2016).

⁷ This is an effect that they further argue is stronger in poor countries with weak governance.

⁸ Arezki et al. (2017), using country panel data, show that following an oil or gas discovery, the current account and the savings rate of the country in question both decline for the first five years, but can then rise sharply in the ensuing years. Investment rates typically rise robustly on the news of the discovery, but GDP does not increase until after a significant lag of years.

administration. The first three of these sectors easily outdistance the FDI jobs in extraction in spite of the much larger dollar value of investment in that sector (Toews and Vezina 2017: 35).⁹

Additional to this FDI activity, Mozambique from about 2013 should have experienced a significant additional increase—this time in public investment activity—associated with the very large external loans to various companies and government-linked organizations that were contracted on the assumption that Mozambique would quickly become a global gas exporter. In spite of audit activities that have subsequently been organized around the loans, considerable uncertainty still surrounds them, about both the exact amounts involved and also the uses to which the monies were actually put. In total these new loans have been reported to be as high as US\$2.32 billion. In relation to these particular huge loans, there seems to have been a complete disregard for the standard principles of good public project selection—a point relevant to one of the questions posed at the end of Section 1. Certainly there was a stark inconsistency in these loans, in terms of both their magnitudes and their maturity structures, relative to what was then known about the volume and timing of the likely revenues from natural gas.

The loans contracted at the end of the era of President Guebaza in 2013–14 were to agencies such as EMATUM (the Mozambique Tuna Company), Pro-Indicus (a security-related company), and MAM (Mozambique Asset Management). They notionally provided for improved maritime security and logistics for gas projects linked to the work of Mozambican intelligence.¹⁰ An independent audit of these three organizations has become one of the conditions for the normalization of relations between the government of Mozambique and the IMF, which were suspended in 2016 because of the undisclosed loans. In the absence of the audit results, it is not possible to numerically square the large amount of these loans (~20 per cent of the country's GDP) with the already large investment boost that is visible in the national accounts data as shown in Figure 1. But certainly there should have been some further boost from the investments associated with them.

Significantly, the recent IMF *Regional Economic Outlook* (IMF 2018b) presents projections suggesting that the unusually high investment rate shown in Figure 1 may actually be exceeded in the period through 2019. Specifically, the investment rates shown by the IMF for Mozambique for 2018 and 2019 are 54.7 per cent and 86.3 per cent of GDP respectively.

3 The effects of an investment surge

The older literature on development based on the early growth theories would have anticipated a strong and unambiguously positive effect of increased levels of investment on a country's rate of GDP growth.¹¹ Notwithstanding the greater complexities of effects and outcomes that have been introduced by later growth theories—and not least the models of endogenous growth—there is

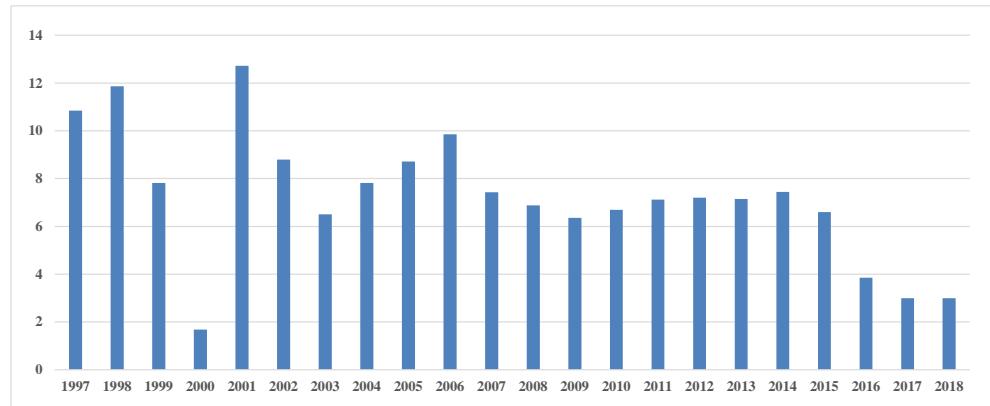
⁹ This analysis is based on the aggregation of sectors of activity into nine aggregated sectors.

¹⁰ Since the loan to EMATUM (US\$850 million) was arranged as a bond issue on European bond markets, it became public knowledge in 2013, but there was no similar disclosure until much later in the case of the loans to Pro-Indicus (US\$622 million) and MAM (US\$535 million). The undisclosed loans were provided by the Swiss bank Credit Suisse and Russia's VTB bank; both banks have faced significant criticism for their actions. More detail is available from Chatham House (2016).

¹¹ For example, in the so-called 'big push' models that were popular in the 1950s and 1960s, but also in most longer-term development plans that many developing economies were producing in that period and that some countries are still producing. See, for example, Rosenstein-Rodin (1961) and Murphy et al. (1989).

still a strong current of opinion among practitioners that anticipates that *more investment means more growth*.¹² However, this has not been the case—at least thus far—in relation to the outcomes seen in Mozambique. Figure 2 shows the country’s GDP growth record over the period 1996–2017. It is noted that Mozambique was a star performer, certainly in African terms, in the late 1990s and through the first decade of the new millennium. However, there is no evidence in these numbers of the growth spurt that might have been expected to result from the very large FDI inflows after 2010 and the other investments associated with huge levels of new public borrowing. Paradoxically, growth in the period since about 2013 has been weaker than at any time in the past 20 years. Further, the projections from the IMF *Regional Economic Outlook* of April 2018 (IMF 2018b) suggest that the growth rate through 2019 will remain below 3 per cent and so even become slightly negative in per capita terms.¹³

Figure 2: GDP growth rates, 1996–2017 (%)



Source: Author’s illustration, based on data from the World Bank, <https://data.worldbank.org/indicator/NY.GNP>.

There are, of course, a variety of special factors than can account for at least some of the lack-lustre growth record of the most recent past. Until the mid-2000s, Mozambique’s impressive growth was largely the result of an economy recovering from conflict, supported by very significant inflows of foreign aid to help rebuild the country after the war—up to 40 per cent of GDP in some years. Subsequently the gloss on the growth performance has been undermined by a combination of reductions in overseas development assistance support (accelerated by the negative reaction of bilateral donors to the undisclosed loan affair); by lower prices for many key exports; and by the damaging effects of the El Niño drought affecting large parts of southern and eastern Africa.¹⁴ Nonetheless, the co-existence of a very high investment rate with very weak growth outcomes still seems to be a significant puzzle.

However, as the recent literature shows, such a combination is not in fact that unusual; other countries have experienced similar outcomes. In particular, a 2014 paper by Andrew Warner examines data for 124 low- and middle-income countries and probes in detail some 24 cases of

¹² Various papers including by Barro (1990), Barro and Sala-i-Martin (1992), and more recently Agenor (2010) have analysed the growth impact of public investment in the context of endogenous growth models.

¹³ Although later IMF updates now anticipate a slightly better growth performance through 2018.

¹⁴ The El Niño weather outcome in 2015–16 was one of the worst in 50 years. It caused intense drought in southern Africa that had a highly negative impact on food security across large parts of Zimbabwe, Malawi, Zambia, South Africa, Mozambique, Botswana, and Madagascar.

identifiable *public*¹⁵ investment booms and their impact on the growth of GDP per capita in the period 1960–2011.¹⁶ His results show some small instantaneous impact of the boom investments on GDP per capita. However, that impact is not sustained when the investment boom variable is lagged two, three, and four years.¹⁷ In other words, the positive impact on growth does not persist beyond the first year. Indeed, diagnostics based on an F-test fail to reject the proposition that the long-run impact of the investment boom is in fact zero. So aside from the small instantaneous gains that Warner finds in most country cases, there is little evidence of the productivity enhancements associated with increased investment levels that might be expected over time.

Instead, one possible rationale for his results is that the instantaneous gains come from Keynesian-type *demand* effects, especially in countries with under-used capacity. By contrast, the evidence from most of his sample countries is that the *supply*-side effects (of investment on the production function and any associated productivity enhancements) are generally weak and more usually non-existent. Why might this be the case? Following examination of three investment boom cases in greater detail (Bolivia, Mexico, and the Philippines), Warner suggested several common features of decision-making in these countries that together can result in low-productivity investment:

- a failure to select public investments by reference to sound economic criteria;
- a systematic tendency to use over-optimistic predictions of prices, cost, and impacts;
- a serious lack of information at the time of implementation to identify the likely (true) rates of return on investments and their impacts;
- inertia in investment programmes which means that an investment once started is likely to continue to command finance even when the conditions needed for success deteriorate; and
- a high degree of vulnerability of the public investment decisions to abuse for personal or political motives.

It is a plausible hypothesis that Mozambique’s recent poor record reflects in part the consequences of at least the first three of Warner’s five common features of decision-making around public investment, with the final bullet plausibly relevant to Mozambique subject to the results of the audit referred to above.

A striking contrast to these three country cases is offered by the cases of Taiwan and South Korea that Warner also examined in greater detail. Here, the *positive* common features of higher levels of investment in both cases included the following:

- A concerted public investment boost occurred *after* rapid growth had already started—that is, it was a response to growth and not the initial driver.

¹⁵ It is important to note that Warner’s study relates to *public* investment and that the results do not necessarily carry over to investment in general. Nonetheless, the results do provide a useful warning note to Mozambique as a country that has already experienced a general investment boom including a very large public capital element (that has so far failed to trigger any significant GDP response) and may indeed see an even larger subsequent public investment boom as the huge anticipated revenues from natural gas eventually emerge.

¹⁶ His methodology differs from most earlier cross-country investment econometrics in that it did not seek to estimate the average relation between public capital and GDP over time but rather focused only on those time periods when there were major and identifiable investment drives. This avoids the implicit assumption that the estimated relationships from an averaging approach will also apply to periods of large booms in investment.

¹⁷ The coefficients on these variables being statistically insignificant and occasionally with the wrong sign.

- Policy makers presented their investment drives as attempts to deal with infrastructure bottlenecks that were clearly manifest after some years of rapid growth.
- Larger investments were highly focused, with clearly defined objectives (e.g., quality highways to connect the two main urban areas in Korea and infrastructure to remove remaining bottlenecks to exports in the case of Taiwan), and also disciplined as to the magnitude of cost overruns that the authorities permitted before withdrawing funds.

Similar findings that are more directly relevant to an investment boom based on large oil and gas discoveries have been presented in a more recent paper by James Cust and David Mihalyi (2017). They coin the term ‘presource curse’ to distinguish its propositions from those of the more familiar ‘resource curse’.¹⁸ The presource curse deals with the period that is typically relatively short (but of uncertain duration) between the discovery of any new resource and the start of production. Specifically, these authors examine 236 giant discoveries of oil and gas (larger than 500 million barrels) in 46 different countries in the period since 1988. The authors examine the growth records of the countries concerned in the period following the discoveries and assess these against two benchmarks, namely:

- Was growth after the discoveries higher or lower than in the years before?
- Did the growth actually achieved keep pace with the IMF projections as routinely published in the IMF’s *World Economic Outlook*?

The results were mixed. Countries that the authors categorized as having weaker political institutions typically failed to achieve not only the IMF forecasts for growth, but also the average growth rates of the countries’ own past, which is unfortunately the situation that applies to Mozambique (see Figure 2 and the following analysis). But other countries, with stronger institutions, typically see growth rates that at least match those of the past and also conform with the IMF forecasts. So it is a mixed story. Arguably, its most striking aspect is the absence of the *assured* growth bonanza that the public and politicians of most countries discovering new oil and gas reserves typically expect to see. Further, given the time periods involved, the results tell us that it is merely the *promise* of resource abundance rather than its actual realization that gives rise to any growth-retarding effects that are involved in this new variant of the resource curse. The results also seem directly and alarmingly relevant to what has been experienced in Mozambique!

4 Mozambique expectations and realities

In the past two decades, Mozambique has followed a pattern that has been evident also in several other extractive-dependent low- and middle-income countries. Specifically in the period 1996 through 2012, the country saw a very large increase in its percentage dependence on extractives activity measured in terms of exports. Back in 1996 the extractives share of the country’s total export earnings was just 6 per cent (metals) and 8 per cent (when coal, oil, and gas are included). By 2012 those numbers had risen to 36 per cent and 72 per cent respectively—a pattern of increase that was similar to that in several comparator countries, including Rwanda, Mali, Tanzania, and Burkina Faso (for more complete details, see Roe and Dodd 2017).¹⁹ That large statistical

¹⁸ The latter focuses mainly on the long-term negative consequences for the economy from resource production and taxation, as a result of factors such as Dutch disease, the corruption of political processes, etc.

¹⁹ In terms of government revenue, IMF data (reported in ICMM 2016) show that the extractive sectors contributed an annual average of about 6 per cent to total government revenues in a sample of 24 countries (that are either metals

increase—in all the affected countries—is explained in part by the price effects of the so-called ‘super cycle’ of commodity price increases that began around 2001. But that was only part of the story, and the export dependence of Mozambique on extractives continued to increase further through 2014, in spite of much softer prices after 2012 and even though, by that stage, there had been no additional export boost from the newly discovered gas.

However, after 2010 and the new discoveries described in Box 1, strong expectations quickly emerged that the additional revenues from natural gas would hugely increase the country’s already significant levels of extractive dependence—including in terms of both exports and government revenues. Within a few years of the initial discoveries, the IMF was sufficiently confident about these new prospects to not only construct but also to publish a model that projected the likely future levels of macroeconomic impacts from the natural gas and the associated LNG production (IMF 2016a). In brief, they showed the following:

- Assuming a start to LNG production in 2021, the two main operators (Anadarko and ENI) could eventually construct a total of 13 onshore LNG trains and four FLNG trains for the gas project. The total production volume of LNG could thereby reach 89 million tonnes 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.

A look back to the dismal growth numbers for the period 2016–18 (shown in Figure 2) quickly confirms how dramatic the statement in the second of these bullets appears. A reference to IMF comparative data on the government revenue collections from extractives indicates that the achievement of the 50 per cent shown in the third bullet would turn Mozambique into a world leader in this particular respect.²⁰

These and other, more detailed numbers from the IMF projections as published in January 2016 are shown in Figure 3. 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 the Roe–Dodd analysis. 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. With the benefit of hindsight it is questionable whether the IMF should have published these very bullish numbers, given the question marks that would have qualified the projections at the time they were made. There is no hard evidence that the publication of the numbers impacted government decision-making, but certainly they are more, rather than less, likely

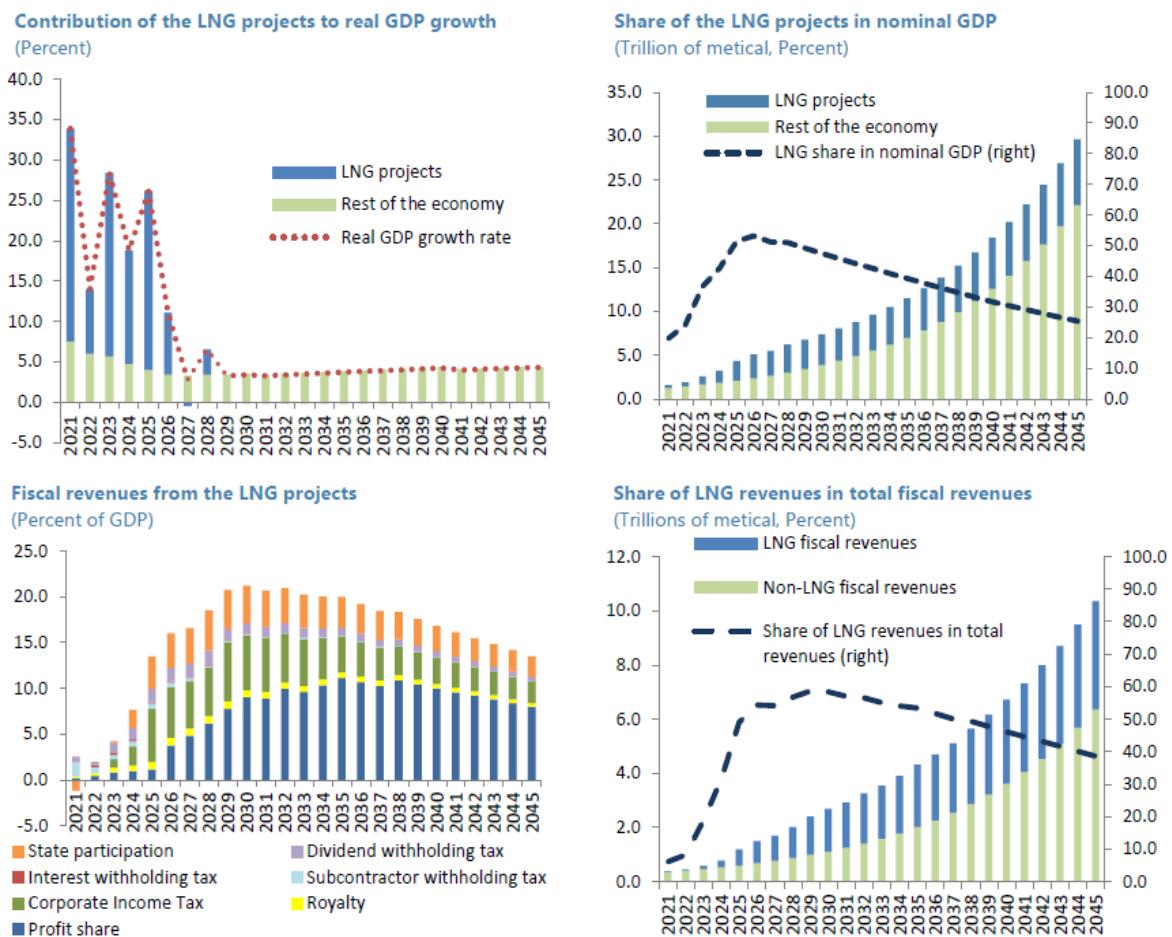
producers or have some combination of metals and oil and gas) in the period 2000–13. The Mozambique average for that period was just 6 per cent. However, that contribution was also on a rising time trend.

²⁰ In the IMF comparative data for the period 2000–13 (for countries that are either metals producers or have some combination of metals and oil and gas), the best-performing country in terms of the government revenue take from extractives was Botswana, with 45 per cent. No other country in the sample achieved a revenue-take greater than 30 per cent.

to have fostered an optimistic mood within government that may have influenced expenditure and borrowing decisions.

Regrettably, that anticipated economic boost has not yet materialized; 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). Indeed, in a very real sense, the ‘bust’ has come before the ‘boom’ that the IMF projections and most other commentators were expecting back in early 2016! The unprecedented high investment numbers described above have not been translated into anything approaching a boom for the economy. Indeed, they have foreshadowed what seems likely to be a sustained period of deep economic difficulty for the economy.

Figure 3: Selected numbers from the 2016 projections of the Rovuma benefits



Source: IMF (2016a).

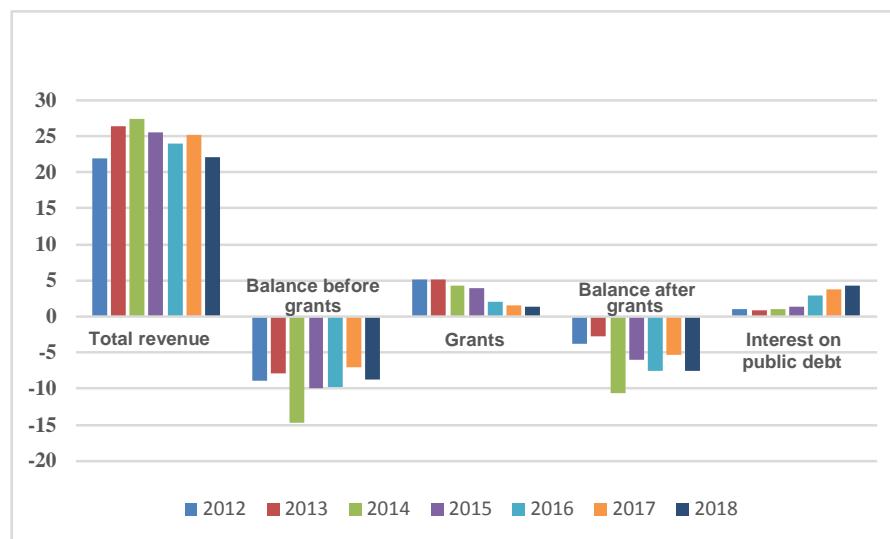
There is an obvious question about what might have been done differently to avoid, or at least moderate, the ‘irrational exuberance’ that has contributed to this difficult situation. The answer relates in part to specific decision-making processes in Mozambique about which we have insufficient knowledge to comment in detail. However, it is reasonable to suggest that these processes (at least through 2013–14) were impaired by some or all of Warner’s common failings of decision-making as listed earlier. So, the remedy going forward is to look in detail at these possible explanations and to make corrections as needed.

What we do know with certainty is that the problems to which the unfortunate (presource curse) reality that we have described gives rise are manifest most obviously in the country’s *fiscal* situation. We can

examine this first in relation to *borrowing*. Standard economic reasoning would suggest that there is a perfectly legitimate case for increased public borrowing in the time period between any major new discovery and the actual start of production of that resource. That extra borrowing could be justified by, among other things, the need to provide the extra public goods and services needed to support the private investment activity, and to anticipate what could eventually be a large hike in national wealth and the fiscal share in that increase. However, any increased borrowing still needs to be cognizant of both the *fiscal* productivity of the extra spending (i.e. how much extra tax revenue will it generate and how quickly?), and the additional debt service in the period *before* the large expected extractive revenues actually accrue. If we relate this logic to the EMATUM bond issue of 2013, one problem is immediately obvious and should have been obvious at the time when the loan was contracted. The bond issue had a coupon rate of 6.305 and a maturity date of 2020. So even if the very optimistic projections of the IMF (Figure 3) had proven to be correct, that loan would have needed to be fully repaid *before* even one dollar of the additional gas revenues might have been available in the government coffers. The promise of huge additional revenues at some future date would have been of little help in servicing the additional debt in the period to 2020. Given that any pre-2020 availability of increased fiscal revenues from gas was never a realistic possibility, the servicing of the new loan (both interest and capital repayment) between 2013 and 2020 had to impose itself fully on the pre-existing government revenues.²¹

This might not in itself have been such a problem if fiscal revenues more generally had responded in a very buoyant fashion to the investment boom that we have described. But this did not happen, in part because there was at best only a limited *direct* tax yield from those investments, and partly because the *indirect* tax yield that might have been expected from an early boost to the growth of incomes and GDP has not materialized (Figure 2). Figure 4 documents some relevant trends in Mozambique's fiscal revenues in greater detail.

Figure 4: Selected fiscal trends, 2012–18 (% of GDP)

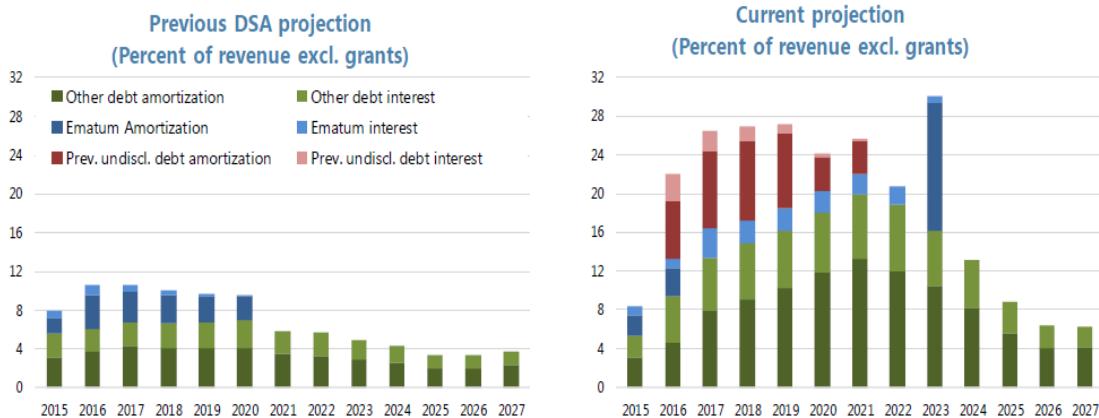


Source: Author's illustration, based on IMF (various).

²¹ Since that burden of additional debt service in the event could not be met, the solution has been to exchange the original bonds for notes but with a much higher coupon rate (10.5 per cent) and a bullet payment maturity date of 2023. Similar comments probably also apply to the other undisclosed loans of the late Guebaza period, but in the absence of any knowledge of the terms of these loans it is difficult to comment in any detail.

The left-hand panel in Figure 4 shows that since 2013–14 the levels of government revenues relative to GDP have been either flat or in decline. There has not been a boost to government revenues anything like sufficient to cover the extra debt service costs that are now called for. Specifically, the interest alone on public debt was already equal to some 20 per cent of total government revenues by 2018 (over 4 per cent of GDP as compared to 1 per cent or less in 2012 and 2013), and is projected to rise to well over 25 per cent of those revenues by 2019 (IMF 2018a). This clearly represents a huge shock to the fiscal accounts and one that has caused a remarkable readjustment of the IMF’s own assessment of Mozambique’s debt sustainability, as evidenced in the comparative graphics shown in Figure 5.

Figure 5: IMF debt sustainability assessments (DSAs) (left) December 2015 and (right) January 2018



Source: IMF (2016a).

Specifically, the latest available (January 2018) assessment by the IMF suggests that the government now needs to commit almost 30 per cent of its total revenues (net of grants) to meet debt service obligations, but with an even higher level of revenue commitment when the EMATUM balloon payment is due in 2023.²²

The situation could have been eased somewhat if the *grant receipts* from external donors had held up in the face of the changing situation. But as the third panel in Figure 4 indicates, these grants have in fact fallen substantially since 2012. In 2012, 2013, and 2014, grant receipts were the equivalent of 5.1 per cent, 5.2 per cent, and 4.2 per cent of GDP, respectively. But in the four years to 2018 they have declined to the equivalent of only 1 per cent of GDP, with an even lower figure projected for 2020 (IMF 2018a). The April 2016 suspension of the IMF programme in Mozambique was followed fairly swiftly by similar suspensions or reductions in support from the World Bank and other donors such as the EU, France, Britain, and Canada. In July 2017, Japan announced that it too was freezing £100 million in grants and loans pending a new agreement with the IMF. Thus the direct fiscal impact of the new borrowing (~5 per cent of GDP of additional interest payments, as shown in Figure 4) has been compounded by the further hit (~4 per cent of GDP) associated with the reduction of grant receipts.

²² A situation made significantly worse by the rapid depreciation of the metical in 2014–16.

5 A few implications

There are many implications of the abrupt turn-about in Mozambique's economic prospects since 2016. In this section we consider just a few of these.

5.1 The fiscal starting point

It is now a reasonable assumption that investment in ENI's Area 4 Coral project may begin later in 2018,²³ with production therefore beginning maybe in 2023 but more likely in 2024. The Area 1 project of Anadarko cannot now be assumed to begin until 2019, with production therefore beginning only in about 2024 or later. For the purposes of this present paper we have not attempted to provide an update of the IMF projections shown in Figure 3, but it is reasonable to assume that the profile of outcomes shown there will be broadly similar but with a much delayed start date in terms of production and extra revenues to government: 2024 or 2025 rather than 2021.

In terms of the *statistics* of the situation, the combination of circumstances we have described above will mean that Mozambique will begin the era of new gas production in a very different and much more difficult fiscal situation than was anticipated even three years ago. Specifically, it is likely to enter that era with a *primary* fiscal deficit of over 6 per cent of GDP and an overall deficit including interest payments of around 10 per cent of GDP²⁴ (but as high as 12 per cent excluding grants²⁵). So, as of the time of writing (mid-2018), the country faces at least six more years during which further high rates of private investment will co-exist with a situation in which there will need to be severe fiscal restraint, ongoing high debt ratios, and growth rates that initially seem likely to remain low.

Even when the enlarged revenues from the new gas do eventually materialize, they most likely will need to be committed quite heavily to deal with the still high rates of debt and debt service. Indeed, economic theory suggests that it would be in the interests of the country to accept such a prioritization of its own expenditures. For example, van der Ploeg and Venables (2017: 10), based on an intertemporal model, argue that 'it is not appropriate for a developing economy to set up an SWF and lend to the rest of the world, but it may be appropriate for such an economy to use its newly found natural resource wealth to pay down existing debt'. This is not a proposition that would have been prominent in the Mozambique discussions back in 2016, but with a coupon rate on the newly restructured debt now in excess of 10 per cent and a poor record on domestic public investment decisions, it is difficult to argue against it.²⁶

5.2 Foregone opportunities

One simple illustration of the consequence of that significant squeezing of the fiscal space is the impact it is likely to have on *social spending*. In a paper based on the earlier buoyant expectations of gas revenues, Witter and Jakobsen (2015) assessed that those revenue would have been sufficient

²³ ENI was reported in December 2017 to have secured project financing in the amount of \$4.7 billion for the Coral South project.

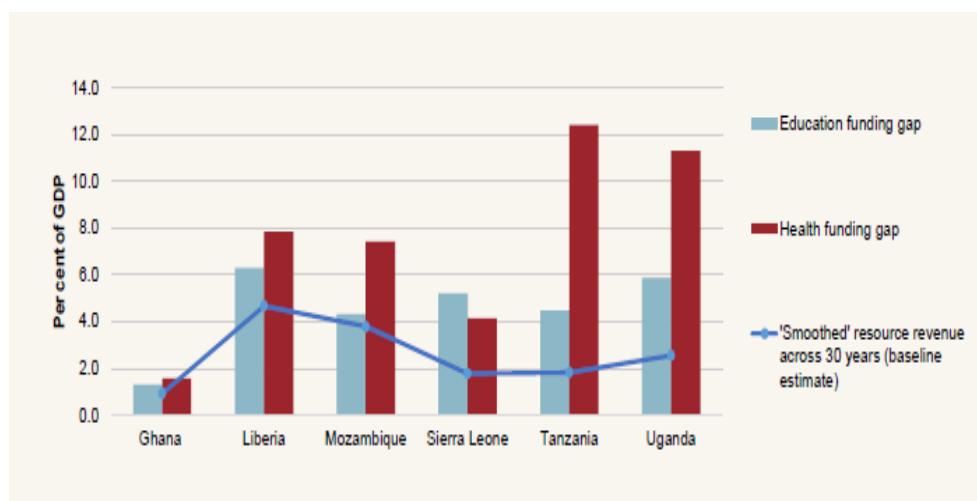
²⁴ IMF Article IV (2017a), table 3.

²⁵ IMF *Regional Economic Outlook* of April 2018 (IMF 2018b).

²⁶ A point that gains added weight from the fact that Mozambique is now in a weak bargaining position vis-à-vis its creditors.

to make a major dent in Mozambique's financing gaps for health and education spending. They did this by comparing the expected annual revenues from new gas—smoothed over a 30-year period—with an independent assessment of the annual shortfalls of education and health spending.²⁷ The results of this comparison for Mozambique and five other African countries with major new oil and gas or metals discoveries are shown in Figure 6. Those results show that Mozambique was expected to be in strong position in this regard relative to most of the comparator African countries that were also assessed. Specifically, the anticipated annualized revenues from the new gas would have been fully equal to the size of Mozambique's estimated education financing gap (4 per cent of GDP annually) and to over 50 per cent of its larger health financing gap. Sadly, as we can see from Figure 4, these possibilities—at least in the medium-term future—have been fully extinguished by the loss of fiscal space associated with additional interest costs and the reduction of grant funding from donors: a total squeezing of fiscal space equivalent to some 9 per cent of GDP!

Figure 6: Financing gaps and new extractive revenues



Source: Witter and Jakobsen (2015: 8).

5.3 Macroeconomic choices

Inevitably this problematic starting point has also meant that the macro management choices that are now available to the government of Mozambique are seriously limited. But there are still some important principles that govern the choices that will eventually emerge. In terms of macroeconomic theory, intertemporal optimizing models of the type developed by, for example, van der Ploeg and Venables (2017) lead clearly to the result that *the greater the capital scarcity in an economy, the bigger the fraction of any increment in total assets that should be allocated to domestic capital*.²⁸ Subsequent to the undisclosed loan scandal, the resulting fiscal difficulties and the withdrawal of much donor support, this result seems to fit well with Mozambique's current fiscal situation. Notwithstanding the large new private inflows expected in relation to the new gas discoveries, the public sector in Mozambique will remain capital-constrained for several more years. Hence, based on this result, any gas surplus when it does begin to emerge should arguably be concentrated on

²⁷ Based on the amount of spending needed to achieve specific health and education outcomes as explained fully in their paper. See also Witter et al. (2015)

²⁸ 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.

building domestic capital rather than accumulating balances in, for example, a sovereign wealth fund (see a fuller discussion in Section 5.4).

The caveats to this conclusion relate to two main factors, namely (1) the presently unsustainable level of the country's external debt, as already discussed, and the strong influence that this accords to external creditors; and (2) major questions about the capacity of the country to decide on, design, and implement sound public investments.²⁹ The combination of these two factors suggests, first, that in the next few years at least any windfall revenues should be heavily committed to help reduce levels of debt; and second, that even in the absence of the debt-servicing problem, the country would be well advised to build a pipeline of good and economically viable public projects and improve its capacity effectively to manage these. The hard reality of the first of these points is confirmed by the August 2018 proposal by the so-called Global Group of Mozambique's Bondholders that they should be paid portions of Mozambique's future natural gas revenues as part of the restructuring of the country's Eurobonds.³⁰ All in all, the priority to invest domestically as deduced by the theoretical model is countered by these two practical considerations, as van der Ploeg and Venables themselves accept.

5.4 A sovereign wealth fund

The theoretical and practical arguments also combine to suggest implications for a possible sovereign wealth fund (SWF) in Mozambique. 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 also Tanzania—a country that faces similar challenges. An 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 setting up and operation of such a fund, and Mozambique's record over the past few years has already undermined its reputation in this regard. Many other things needs to happen before the mere establishment of an SWF could play any sort of signalling role as to the country's financial probity.

Nonetheless, Mozambique in recent years has made several partial commitments to the establishment of an SWF.³¹ 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, the radical change in the country's fiscal circumstances means that there is now little possibility or indeed any credible case for establishing an SWF in Mozambique in the foreseeable

²⁹ This capacity problem might include, for example, a lack of capacity to design and develop projects; weak arrangements for project selection and cost–benefit processes; and limited capacity to procure, implement, and monitor projects.

³⁰ Reported in *Further Africa*, 5 August 2018. The group asked not to be identified on the grounds that their proposal had not been publicly announced.

³¹ Based on public domain information, it appears not to have specified in too much detail the specific motives that drive this possible institutional development.

future. As we have seen, the country faces several years of significant budget deficits and, given these, it seems inconceivable that its budgetary and political processes would be able to commit even 0.5 per cent or 1 per cent of GDP annually into an SWF. Imagine the political infighting at budget time associated with preserving such an annual transfer (and far less the accumulating balance) untouched. Even in the unlikely event that this were to prove politically possible,³² the amounts involved would be unlikely to be of any real significance to the future generations that they might be assumed to serve. Mozambique's population today is around 30 million, and it has a per capita income below US\$500. So a 1 per cent annual contribution to an SWF would yield only about US\$150 million annually or US\$1.5 billion over a 10-year period, augmented by interest returns but reduced by administrative costs (that would be high in percentage terms, given the small size of the fund). Given the anticipated rise in population over that 10-year period, this would deliver a per capita amount of around US\$35!³³

The case against an SWF in the near future is further strengthened not only by the theoretical argument regarding capital-scarce economies, but also by the point that such funds have a number of different possible objectives. These are spelled out by, for example, van der Ploeg and Venables (2017). These authors identify the three main reasons why a country might choose to place its resource windfalls partly in an SWF. These are (1) to transfer funds to future generations; (2) to establish a 'parking fund' in cases where revenues build up faster than the economy's capacity to invest these effectively; and (3) to build a stabilization balance against future volatility in extractives prices. Problematically, these three motives require quite different types of investment funds of foreign assets (e.g., short-term maturities for the 'parking fund' and 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 challenge of running the SWF, 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.

Once Mozambique has passed through the difficult medium-term period of fiscal adjustment that now seems unavoidable and there is some emerging fiscal space, there would be a case for establishing some sort of stabilization fund to help manage the macro difficulties of future gas/LNG price volatility. Thus far the authorities seem not to have adequately recognized the inherent difficulties of managing the risk of revenue volatility that they face. But this does not seem to be an issue that can be addressed in the near-term future through the use of an SWF. Similarly, there may be a case for a parking fund—but only in the medium term—as gas revenues build. In the meantime, Mozambique needs to rely on more traditional counter-cyclical fiscal measures to address future commodity price cycles, but to do so subject to the pre-existing constraint of a major ongoing fiscal deficit. The authorities would also be well advised to prioritize

³² Similar challenges have proven too much for other countries, such as Ghana and especially Chad. See, for example, Bawumia and Halland (2017).

³³ A 2016 blog compared the cases of Norway—the benchmark of successful SWFs—and Tanzania. It was pointed out that in 25 years, the Norwegian SWF had accumulated assets that amounted to almost US\$900 billion (growing to exceed US\$1 trillion by the end of 2017). That is equivalent to US\$178,000 for every one of Norway's five 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 middle-income countries such as Mexico and to a substantial multiple of the total economies of Tanzania and also Mozambique. 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 (Roe 2016). SWFs in Tanzania and *pari passu* Mozambique are in fundamentally different situations from that of Norway's SWF, and in no realistic sense respect can they draw on the Norwegian SWF as their model.

arrangements to strengthen the effective management of future public investments to avoid the losses and low returns associated with some previous investments.³⁴

5.5 Investing for structural transformation

Capital scarcity combined with the sobering experience of the poorly conceived public investments of 2013–14 conveys a strong message about the need for a significantly different Mozambique approach to public investment and the associated policies in the future: an approach that would be both more strategic and more conscious of the longer-term objective of structural transformation. At a time when the scale and economic significance of extractive resources (LNG, numerous metals, coal, etc.) are larger than at any previous time in Mozambique’s history, it must surely be recognized—notwithstanding the immediate pressures of the fiscal deficit—that *extractives activity and the revenues they will eventually bring 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, a transformation that has been seen intermittently in Mozambique’s past history but that has never been sustained.³⁵

In a recent Chatham House paper by Paul Stevens et al. (2015),³⁶ the authors remind us in general 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—are a vital component of a broader strategic approach to accommodating an extractive industry.

This reality opens up a very wide range of new policy challenges for Mozambique, as for other governments hosting major extractives resources. This is because it requires a significant level of buy-in by, and coordination between, a wide variety of government ministries and agencies, involving not only the mainstream agencies—finance, planning the central bank, etc.—but also the set of agencies that deal directly with petroleum, gas, and/or minerals (such as MIREM, ENH, INP, and ENHL³⁷). This is particularly pertinent in relation to Mozambique’s national oil

³⁴ It may also want to heed the recommendation based on the findings in the paper by Cust and Mihalyi (2017: 40), namely that ‘countries should pay more attention to behaviour before revenues arrive – such as obtaining public consensus to constrain government budgets – rather than focusing on what percentage of future receipts will be saved’.

³⁵ As is shown in the UNU-WIDER paper by Cruz and Mafambissa (2016), around 80 per cent of Mozambique’s labour force is still engaged in agriculture, livestock, forestry, and fisheries, and working with low-productivity technologies. 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)

³⁶ As further developed by Lahn and Stevens (2017).

³⁷ Ministry of Mineral Resources and Energy; Empresa Nacional de Hidrocarbonetas EP; Instituto Nacional de Petroleo; and Empresa Nacional de Hidrocarbonetas Logistics, respectively.

company, ENH, given its central role in the financing of the new gas investments, and the very large downstream investments for which it will be responsible.³⁸

A broader take on the transformation agenda is obtained by noting the clear lesson from international experience, as expounded by Östensson (2017), that in many countries such as Mozambique 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—even in spite of the stimulus of very large new investments in some few sectors such as extractives. 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, and more. 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 (UNU-WIDER and USAID 2012; UNU-WIDER et al. 2018).³⁹ This being the case—and given the long-term vision referred to above—it may be much better to prioritize systematic programmes to address these business climate constraints than to emphasize apparently easier (but narrower) policy devices of, for example, fixing local content targets directed narrowly at a few extractives companies.

So to conclude on this point, the future public investment challenge for Mozambique can be argued to involve *three* main elements. First, it is vital to put in place much improved arrangements for the management of public investment in the context of a sound *overall* medium-term framework for public finance management. Although it is beyond the scope of this present paper to present full detail on the component parts of such a framework, it is useful to note the valuable guidance on most aspects that can be found in the Natural Resource Governance Institute's (NRGI) Natural Resource Charter Benchmarking Framework (NRGI 2017) and especially the guidance that this offers in relation to Precepts 7, 8, and 9 of the Charter.⁴⁰ In terms of the specific arrangements to achieve an improved programme of public investments, these would include enhanced capacity to design and develop projects; improved methods for project selection; more rigorous/disciplined use of cost–benefit processes; and improved capacity to procure, implement, and monitor projects.⁴¹ In this context, it is helpful to also repeat the various reasons that Warner (2014) identified as contributors to the poor investment outcomes in countries such as Bolivia, Mexico, and the Philippines. These included a lack of attention to sound economic criteria for project

³⁸ See also the useful analysis of national oil companies by Heller et al (2014). In view of the present uncertainties about the timing of the gas investments in Mozambique, it is not fully clear how large will be the revenue take that will accrue at least initially to the ENH once the large LNG revenues begin to materialize. However, a limited insight into this is available from the IMF fiscal data projections shown in Figure 3. Even if ENH receives only the element of total revenues referred to in Figure 3 as ‘state participation’, it would still be receiving the equivalent of 3–5 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, ENH is clearly in a central position regarding the future utilization of a large chunk of the public funds that will play a key role in establishing the future structural direction of the Mozambique economy.

³⁹ Certainly, Mozambique still has poor ratings in terms of most of the dimensions of doing business as assessed annually by the World Bank. Specifically, 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—‘getting credit’, ‘getting electricity’, and ‘enforcing contracts’—Mozambique ranks only 159th, 150th, and 184th respectively, and is still distant from the best-practice frontiers, in spite of some improvements in all three areas in recent years.

⁴⁰ These relate to revenue management and public spending.

⁴¹ These are points frequently made in particular by Paul Collier. See, for example, Collier (2010) and Collier and Venables (2011).

selection; a systematic tendency to use over-optimistic projections of future prices and costs; difficulties in withdrawing finance from projects that were failing to perform because of changed circumstances; and a high level of vulnerability of the investment-decision processes to abuses for either political or personal motives. A useful recommendation for Mozambique to pin down greater detail on this would be to arrange for a diagnostic (based on an application of the NRGI's well-tested Benchmarking Framework⁴²) to identify where existing practices/processes most need improvement.⁴³

Second, there is a need for a high-level vision of the future structural possibilities based on the new gas and the country's need for long-term economic transformation. That vision would not only define the long-term economic future to which the country can aspire, but also try to find ways to sustain this vision consistently, in spite of the many short-term pressures, political factionalism, and election-driven incentives that will undoubtedly be capable of dislodging it.⁴⁴ It would also need to incorporate the decisions about large volumes of gas-related investment that will be under the control of autonomous state agencies such as ENH.⁴⁵

Achieving an institutional structure that could produce and sustain such a vision would be no easy task in a country such as Mozambique, which struggles with many factional elements (some regionally based) in its governance arrangements. But recognizing the *need* for a change of approach among a core of senior politicians and administrators would be a useful first step. Further, at a time when the fiscal pressures will force many difficult decisions, it may well be opportune to look for a unity of long-term purpose that might otherwise be elusive. 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. Although the challenge and the opportunities are now much greater, these previous experiences may contain some helpful pointers. Some main aspects of these programmes are described by Cruz and Mafambissa (2016) and are summarized in box 6 in Roe (2018).

Third, it would possibly be useful in the context of an ambition to use extractives to catalyse more rapid structural change to develop a concerted attack on the many (known) constraints in the business environment that hold back a larger supply response to new opportunities. This is a more

⁴² It has so far been used in Ghana, Myanmar, Nigeria, Sierra Leone, and Tanzania, and in a partial fashion in some other countries.

⁴³ In addition (but not discussed in this paper) is the significant challenge arising from the way the country is managed/administered from the capital down to the local level from a PFM perspective, both in terms of mitigating negative impacts and leveraging potential positive impacts. So there are big issues not just around macroeconomics and national decisions, but also around public administration and policy decision-making at the subnational level.

⁴⁴ In drafting this paragraph I am conscious of the present paper's omission of any discussion of the many complex and dangerous political economy problems that have the capacity to derail even the best of economic strategies in numerous ways. This gap in the paper can be redressed in part by reference to several sources that focus on the presently difficult political economy of Mozambique, including the Bertelsmann Institute (2016). The problems to which that paper refers have been rendered much more worrisome by the intensification of violent attacks in 2018 (including house burnings and beheadings) by extremist groups, especially in the Macomia District in the northern Cabo Delgado province. Jasmine Opperman, who has commented in detail on these attacks, argues that explaining them through a singular narrative of 'Islamist extremism' lacks critical evidence and for now is nothing more than a speculative response (Opperman 2018).

⁴⁵ 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.

difficult policy agenda both to design and implement that would be a mandated programme of local content requirements. But given the numerous sectoral multiplier effect ripples that follow potentially from a large FDI boost in a sector such as extractives (see the results from Toews and Vezina (2017) cited earlier), it would be likely to have a much larger pay-off in terms of both new jobs and broader development.

6 The epidemiology of the investment boom problem

This paper has examined the significant investment surge that occurred in Mozambique soon after the discoveries of major new natural gas resources in 2009–10. It has also documented some of the seriously disappointing outcomes that have emerged in the wake of that surge: a ‘bust’ has indeed preceded any significant ‘boom’. All the indications now are that a further surge in investment will occur in the next few years as the production in the major natural gas fields begins. Certainly that is the opinion reported in IMF’s *Regional Economic Outlook* of April 2018, which anticipates an even higher investment ratio in the near future than in the recent past. Given this outlook for the next few years, this paper concludes by examining the epidemiology⁴⁶ of a public investment surge, namely the various linkages in the chain of events that run from a possible surge in private and public investment and into other components of a country’s macroeconomic and fiscal situation. This analysis may help to guide the policy choices needed to limit the dangers of the similarly disappointing outcomes in the future: it is not sufficient merely to assert that Mozambique’s current economic difficulties arose because of an ill-considered splurge of additional borrowing.

In conducting this analysis, this final section draws heavily on the modelling presented in a paper by Buffie et al. (2012) that was developed to enhance the IMF’s DSA.⁴⁷ Their model suggests several components/weaknesses of the transmission mechanisms (from an investment surge to economic growth) as follows.

6.1 Macroeconomic problems

A public investment surge (e.g. possibly in response to a new extractive discovery and the FDI that results from that) could in principle *crowd-in* further private activity and so be a very positive force for stimulating enhanced rates of growth. However, that crowding-in effect will work in textbook fashion only if certain familiar macroeconomic difficulties are avoided. In particular, it requires that the new public investment *spending* adds effectively to the productive capital *stock*. The likelihood of that happening, and the avoidance of the opposite *crowding-out* effect depends in practice on:

- public investment choices that avoid poor (infra-marginal) projects with low rates of return;

⁴⁶ Epidemiology being ‘the study of how diseases occur and spread and the strategies that can be engaged to manage and limit the effects of such diseases when they have occurred’ (*British Medical Journal*)

⁴⁷ Their model uses a neoclassical production function in which both public and private capital are productive. But it also builds in parameters that recognize explicitly that spending on public investment does not always imply a commensurate increase in the *stock* of (productive) public capital: because of leakages caused *inter alia* by intra-marginal projects or possible absorption problems. The authors note also that previous papers on this same topic have either abstracted from public debt accumulation or, where this is included, have not allowed for different possible financing schemes and for the impact of various structural factors on debt sustainability.

- the absence of absorptive capacity constraints in the economy that can raise investment costs and lower the rates of return on any new public and private investment. Most economies will be pushed nearer to any such constraints by enhanced levels of FDI and so increased public investment could intensify such effects; and
- the avoidance of real exchange rate appreciation that would generate offsetting negative pressures on the economy's private traded sectors. Once again, in most economies enhanced levels of FDI will put some upward pressure on the real exchange rate and further public investment could easily work to exacerbate such effects.

To ward off the various potential problems suggested by this listing, Mozambique requires a high-quality capacity in economic analysis, modelling, and forecasting that could provide informative forward-looking information to better guide fiscal policy, but also macroeconomic policy more generally: for example, by anticipating the problems associated in particular with the second and third bullet points above.⁴⁸ Such capacity is very rare in African countries, as was confirmed by the recent AfDB study on the topic (AfDB 2017). The effective use of any outputs from such work in policy making is also rare. But the modelling technologies do exist and the capacity in the country could be developed/strengthened, provided there was a sufficiently strong commitment from senior policy makers. In relation to the first bullet point, the suggestions already made above again come into play.

6.2 Fiscal financing problems

In the absence of immediate and adequate new revenues from the extractives discoveries, the funding of any public investment surge requires by definition some mix of higher *tax* revenues, higher levels of *borrowing* (concessional, non-concessional, domestic, or external), or more *foreign aid*. However, that unavoidable reality runs into various problems including the following:

- The likelihood of an increased *tax-take* is undermined by the same caveats shown above, namely that there may be crowding-out effects, and in addition by the fact that most direct benefits from enlarged public investment—even if generally positive—accrue to the private sector. Hence, aggregate fiscal revenues benefit significantly only if average tax collection rates are high. In reality, as in the case of Mozambique, the marginal collection rates (i.e. the tax collections on a typical extra unit of private activity) are typically low. Toews and Vezina (2017), for example, note that over 50 per cent of the employment gains from the Mozambique FDI of recent years have been in the informal sector, where marginal tax rates are effectively zero.
- Although the imposition of user fees on new public infrastructure could help to mitigate the problem of low marginal rates of tax collection, such fees are rare in lower-income countries and collection rates even when user fees are imposed are typically poor.
- Some of the most strategically important public investment in the future will need to be in human capital and subnational institutional changes (e.g. to support a diversifying portfolio of economic activities that allow people to move beyond their dependence on subsistence

⁴⁸ The absence of transparent revenue forecasting commonly results in unrealistic expectations of immediate benefits by both politicians and the public. Expectations range from improved welfare (especially health, housing, and education) to more jobs and better business opportunities that increase the political 'heat' with a risk of social disruptions and unpredictable changes in institutional and policy frameworks as expectations remain unfulfilled. The uncertainty about the nature of the realistic future is exacerbated by the lack of forecasting capacity in most African countries, as documented by the AfDB (2017). That report demonstrates how few African countries have the relevant models to adequately address the forecasting task (AFDB 2017).

livelihoods and basic survival-focused activities), and such investment is unlikely to yield significant short-term gains in tax revenues.

The mitigation of problems in this area relates to the general need to enhance Mozambique's capacity for the analysis and selection of public investment projects. In this specific context, it requires the modelling/projection capacity to incorporate realistic estimates of how particular possible public expenditures will influence future rates of growth, and the likely enhancement of the additional tax-take that may result from such growth, taking into account the inherent difficulties just listed. This enhancement would, of course, be complementary to ongoing efforts to improve the effectiveness of tax administration in general and so increase the tax yield for any given level of economic activity that should result.

6.3 Transition problems

Even if any new public investment programme is self-financing in the long run (i.e. when extractive revenues eventually arrive and economic activity is higher), there may be difficult transition problems, such as a need for short-term increases in tax rates that could further harm private activity. As the Mozambican experience after 2014 illustrates, there are in principle several ways to deal with these transition problems including the following:

- Additional *concessional borrowing* (and/or aid) could in theory limit the need for a difficult fiscal adjustment. However, as evidenced by the actual outcomes in Mozambique after 2014 (see Figure 4), these sources of funding are just as likely to diminish rather than increase in amount once an extractive windfall is in prospect.
- Additional *domestic borrowing* may also provide some help, but the magnitude of such help is seriously limited because: (1) it does not generate any additional resources for the country's balance of payments and so any public investment surge so financed is likely to be accompanied by declining private investment plus consumption; and (2) in thin financial markets such as those in Mozambique, significantly increased domestic borrowing seems certain to cause harmful interest rate increases.
- Additional *non-concessional borrowing*, as the Mozambican authorities have found, can limit the need for a difficult fiscal adjustment *initially*, but even so such borrowing has to be consistent in amount with various possible inefficiencies of the public investment if unsustainable debt dynamics are to be avoided—a condition certainly breached by Mozambique's US\$2 billion of undisclosed loans and the uses to which they were apparently put!

This logic may not be of much immediate comfort to the policy makers who now need to deal with Mozambique's currently difficult macro and fiscal adjustment; any comfort they can draw from increased extractives revenues is still several years away. But at least that logic does help to emphasize one of the main messages from this paper, namely that future public investment has to be much more carefully and strategically managed than in the past. In the absence of significant public funds to spend on development priorities such as improved public infrastructure and other public spending to complement the arriving FDI, the onus falls much more on qualitative improvements to the public sector institutional arrangements. These improvements in turn hinge on making any public spending and policy activity more productive in themselves and also more effective in leveraging the many new opportunities that the future extractives boom will stimulate. The evidence provided by Toews and Vezina (2017) suggests that even in the context of Mozambique's lack-lustre economic performance of the past few years, the FDI from extractives is able to stimulate an impressive range of new indirect private sector activities (measured mainly

by job creation) in many provinces/districts of the country and in several different sectors. More can be achieved along these lines with appropriate policies.

How exactly this general message about public policy translates into specific policies and actions is beyond the scope of the present paper, but is addressed in some depth by other authors (see, for example, Dietsche and Esteves 2018). However, the component ingredients of the appropriate policies/actions would include skills development, general business development and support, arrangements for shared infrastructure and other partnering activities with the private sector, and a coherent structure for encouraging more downstream activity.

Finally, we can return to the various question posed in our introduction to this paper. The analysis above suggests that Mozambican policy making to date has not been well attuned to the very difficult (and new) issues that are associated with a major increase in natural resource wealth—either in terms of the public expenditure choices that this increase requires or in terms of the broader long-term planning and new fiscal and other policy stances that are ideally called for. Hopefully this paper provides a framework for thinking about the component issues and some embryonic ideas for improved arrangements in the future.

References

- AfDB (2017). *Running the Numbers: How African Governments Model Extractives Projects*. Abidjan: AfDB.
- AfDB (2018). *Mozambique Economic Outlook, March 2018*. Abidjan: AfDB.
- Agenor, R. (2010). 'A Theory of Infrastructure-Led Development', *Journal of Economics Dynamics and Control*, 34(5): 932–50.
- Alfaro, A., and L. Charlton (2013). 'Growth and the Quality of Foreign Direct Investment'. In J.E. Stiglitz and J.Y. Lin (eds), *The Industrial Policy Revolution I: The Role of Government Beyond Ideology*. London: Palgrave Macmillan.
- Arezki, R., V.A. Ramey, and L. Sheng (2017) 'News Shocks in Open Economies: Evidence from Giant Oil Discoveries'. *The Quarterly Journal of Economics*, 132: 103.
- Barro, R. (1990). 'Government Spending in a Simple Model of Endogenous Growth'. *Journal of Political Economy*, 98(5): S103–26.
- Barro, R., and X. Sala-i-Martin (1992). 'Public Finance in Models of Economic Growth'. *Review of Economic Studies*, 59(4): 645–61.
- Bawumia, M., and H. Halland (2017). 'Oil Discovery and Macroeconomic Management: The Recent Ghanaian Experience'. Policy Research Working Paper 8209. Washington, DC: World Bank.
- Bertelsmann Institute (2016). *Mozambique Country Report*. Gütersloh: Bertelsmann Institute.
- Buffie, E.E., A. Berg, C. Pattillo, R. Portillo, L.-F. Zanna (2012). 'Public Investment, Growth and Debt Sustainability: Putting Together the Pieces'. IMF Working Paper 12/144. Washington, DC: IMF.
- Chatham House (2016). 'How Can Mozambique Manage Its Debt Crisis?' London: Chatham House. Available at: www.chathamhouse.org/expert/comment/how-can-mozambique-manage-its-debt-crisis? (accessed 8 May 2018).
- Collier, P. (2010). *The Plundered Planet: Why We Must and How We Can Manage Nature for Global Prosperity*. Oxford: Oxford University Press.
- Collier, P., and A. Venables (eds) (2011). *Plundered Nations? Successes and Failures in Natural Resource Extraction*. London: Palgrave Macmillan.
- Cruz, A.S., and F.J. Mafambissa (2016). 'Industries without Smokestacks: Mozambique Country Case Study'. Working Paper 158/2016. Helsinki: UNU-WIDER.
- Cust, J., and D. Mihalyi (2017). 'The Presource Curse: Oil Discoveries Can Lead First to Jubilation then to Economic Jeopardy'. *Finance and Development*, 54(4): 37–40.
- Dietsche, E., and A.M. Esteves (2018). 'What Are the Prospects for Mozambique to Diversify its Economy on the Back of "Local Content"?' Working Paper 113/2018. Helsinki: UNU-WIDER.
- fDi Intelligence (2016). 'The fDi Report, 2016: Global Greenfield Investment Trends'. Report. London: Financial Times Ltd.
- Frey, A. (2017). 'Club of Mozambique Report, 22 August 2017'. Report. Maputo: Club of Mozambique.
- Heller, P., P. Mahdavi, and J. Schreuder (2014). 'Reforming National Oil Companies: Nine Recommendations'. Report. New York: Natural Resource Governance Institute.

- ICMM (2016). *The Role of Mining in National Economies*, 3rd edition. London: ICMM.
- IMF (2016a). *Republic of Mozambique: Selected Issues*. Country Report 16/10. Washington, DC: IMF.
- IMF (2016b). *2015 Article IV Consultation*. Staff Report. Washington, DC: IMF.
- IMF (2018a). *2017 Article IV Consultation*. Staff Report. Washington, DC: IMF.
- IMF (2018b) *Regional Economic Outlook, Sub-Saharan Africa, Domestic Revenue Mobilization and Private Investment*. Washington, DC: IMF.
- IMF (2018c). ‘Press Release Following the Completion of the 2017 Article IV Consultation’. Press release. Washington, DC: IMF.
- Lahn, G., and P. Stevens (2017). ‘The Curse of the One-Size-Fits-All Fix: Re-evaluating What We Know about Extractives and Economic Development’. Working Paper 21/2017. Helsinki: UNU-WIDER.
- Murphy, K.M., A. Shleifer, and R.W. Vishny (1989). ‘Industrialization and the Bid Push’. *Journal of Political Economy*, 97(5): 1003–26.
- Natural Resource Governance Institute (2017). *Natural Resource Charter Benchmarking Framework*. New York: NRGI.
- Opperman, J. (2018). ‘Mozambique: Shadow Violence that Requires Level-Headed Intervention’. *Daily Maverick* 13 June. Available at: www.dailymaverick.co.za/article/2018-06-13-mozambique-shadow-violence-that-requires-level-headed-intervention.
- Östensson, O. (2017). ‘Local Content, Supply Chains, and Shared Infrastructure’. Working Paper 96/2017. Helsinki: UNU-WIDER.
- Roe, A.R. (2016). ‘Will Norway’s Model of Sovereign Wealth Fund Work in Tanzania? A Reality Check’. Available at: www.wider.unu.edu/project/extractives-development-e4d?query=Roe (accessed August 2018).
- Roe, A.R. (2018). ‘Extractive Industries and Development: Lessons from International Experience for Mozambique’. Working Paper 56/2018. Helsinki: UNU-WIDER.
- Roe, A.R., and S. Dodd (2017). ‘Dependence on Extractive Industries in Lower-Income Countries: The Statistical Tendencies’. Working Paper 98/2017. Helsinki: UNU-WIDER.
- Rosenstein-Rodin, P.N. (1961). ‘Notes on the Theory of the Big Push’. In H.S. Ellis and H.C. Wallich (eds), *Economic Development for Latin America*. New York: St. Martin’s Press.
- Stevens, P., G. Lahn, and J. Kooroshy (2015). *The Resource Curse Revisited*. London: Chatham House
- Toews, G., and P.-L. Vezina (2017). ‘Resource Discoveries and FDI Bonanzas: An Illustration from Mozambique’. OxCarre Research Paper 199. Oxford: OxCarre.
- UNCTAD (2014). *World Investment Report*. New York: United Nations.
- UNCTAD (2016). *World Investment Report*. New York: United Nations.
- UNCTAD (2018). *World Investment Report*. New York: United Nations.
- UNU-WIDER and USAID (2012). ‘Mozambique Business Linkages Review: An Overview of Key Experience, Issues and Lessons’. Report. Washington, DC: USAID.
- UNU-WIDER, CEEG, Republic of Mozambique, and University of Copenhagen (2018). ‘Survey of Mozambican Manufacturing Firms 2017/Inquérito as Indústrias Manufactureiras’. Helsinki: UNU-WIDER.

- van der Ploeg, F., and A.J. Venables (2017). 'Extractive Revenues and Government Spending: Short- versus Long-Term Considerations'. Working Paper 45/2017. Helsinki: UNU-WIDER.
- Warner, A.M. (2014). 'Public Investment as an Engine of Growth'. IMF Working Paper 14/148. Washington, DC: IMF.
- Witter, S., and M. Jakobsen (2015). 'How to Use Natural Resource Revenues to Improve Health and Education in Africa'. Flagship Paper 4. Seattle, WA: African Development Bank, with the Bill and Melinda Gates Foundation.
- Witter, S., R. Outhred, A. Lipcan, and D. Nugroho (2015). 'How to Use Revenues from Extractive Industries to Improve Health and Education in Africa'. Flagship Report 4. Seattle, WA: Bill and Melinda Gates Foundation and AfDB.