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Boosting mineral revenues in Zambia

Policy options for a sustainable fiscal regime

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Abstract: Zambia has changed its mineral tax regime repeatedly during the past decades in a bid to raise mineral revenue, but with only modest success. This paper looks at what the country needs to do to create a mining fiscal regime that could sustain operations, boost output, and raise revenues without eroding investment and profitability in the mines. The paper argues that enhancing local ownership of the mines will help assuage resource nationalism while stabilizing the business environment overall. Looking ahead, it will be important for Zambia to build expertise within the line ministries and the tax agency (the Zambia Revenue Authority) for analysing mineral tax and related policies, including issues of domiciliation, transfer pricing, tax loopholes, and how best to address the emerging decarbonization agenda. The creation of a dedicated unit for mining within the tax agency, preferably headed by a commissioner, could help enhance productivity.

Key words: fiscal regime, investment, mineral tax, resource nationalism, transfer pricing, decarbonization agenda

JEL classification: E62, Q33, Q38, H26

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1 Introduction

1.1 Aim of the paper

The aim of this study is to make concrete proposals for a more stable mining fiscal regime for Zambia which is responsive to market conditions. During the past decade, the government has introduced several mineral revenue policy reforms, such as the variable copper price-linked royalty taxes, but with limited impact on revenue generation. Some of the mineral tax interventions have been sporadic and counterproductive, often withdrawn at short notice. Inevitably, the many changes in the tax code have eroded the goodwill between the government and the mining companies, with the latter undertaking diversionary measures to avoid them. Hence, the recent acquisition of some of the mines by the state seems a logical outcome of the operational frictions that have characterized Zambia's mining industry in recent years.

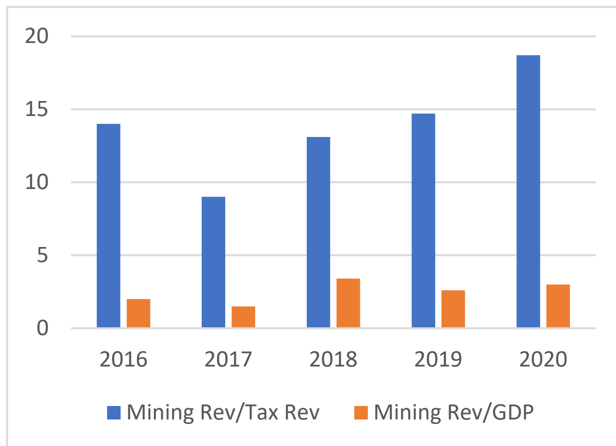
Although several studies have pointed to variable domestic politics and fluctuating fiscal policies as the main culprits for Zambia's failure to establish a stable environment for the mining industry, the number of concrete proposals on how the government could break out of its mineral revenue logjam have been few and far between (Simpasa et. al. 2013; Third World Network-Africa 2017).

This study presents three suggestions for boosting mineral revenues and enhancing fiscal regime stability in Zambia without adversely affecting the profitability of the mining companies or their willingness to prospect for minerals and invest in mine upgrades and new equipment. These are: 1) adopting workable lessons of experience from other countries; 2) creating a flagship joint-venture company (project vehicle) to compete actively with the current mining companies, helping to set standards including on social corporate responsibility and adding value downstream; and 3) building public capacity and expertise on all issues related to mining including that necessary for efficient financial and production audits and negotiations and public policy dialogue on mining revenue policy.

1.2 Copper exuberance amidst stagnant revenues

In revenue terms, Zambia's copper riches have been both liberating and limiting (Figures 1–4), providing unplanned resource inflows during market booms and causing spending difficulties during market troughs. Copper has nevertheless provided a steady flow of government revenue which over the years has been fundamental to constructing the Zambian state, while at the same time creating an economic over-dependence on mining, with few parallels in the region—with wide-ranging socio-economic implications, including structural inequalities (Chamber of Mines of Zambia and International Council of Mines & Metals 2014). These legacies continue to influence policy and practice today and underlie the political economy of Zambia's mineral revenue policy.

Figure 1: Mining revenue contribution 2016–20 (%)

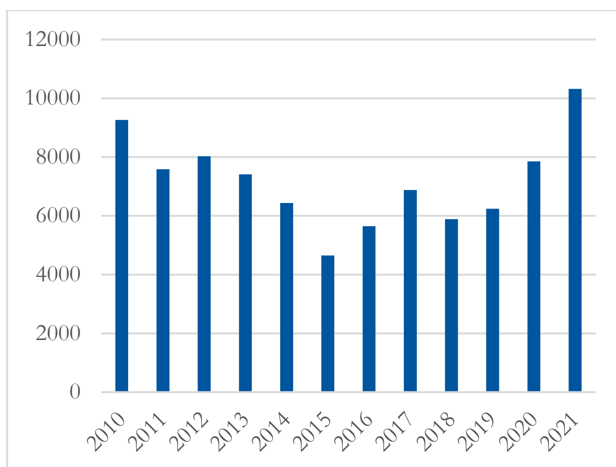


Source: authors' compilation from the Zambia Revenue Authority (ZRA) data.

Figure 2: Mineral revenues 2010–20 (by source US$ million)

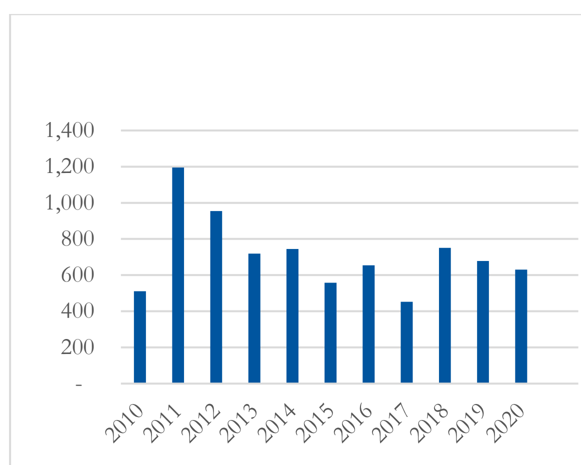
Source: authors' compilation from ZRA data.

Figure 3: Copper prices (US$ per MT) (December averages, except 2021, 2010–21)



Source: authors' compilation from official sources.

Figure 4: Mineral revenues 2010–20 (US$ million)



Source: authors' compilation from ZRA data.

Periods of exuberance for or frustration with copper's prospects are not new in Zambia (in the 2000s copper prices tripled to over US$7,000 per metric ton (MT)). However, the recent copper price increases (by May 2021, copper prices were above US$10,000 per MT) suggest that the economic stakes might be higher than usual, with the bet on where the metal will land having major implications for the country's (high) indebtedness and expected foreign direct investment (FDI) flows. China's early and relatively strong recovery has pushed the copper price above its pre-pandemic level, while global supply constraints are pushing it up further still. More fundamentally, the new global emphasis on 'net zero' suggests that copper may be on the verge of becoming yet more important to the global economy. In addition, Zambia has reserves of even more valuable cobalt. With the right policies, mining could change its role in the Zambian economy from being a foreign exchange-generating enclave to a more integrated sector which would bring the country to the frontier of decarbonized and green-growth development (Ericsson and Löf 2020).

However, a word of caution is in order. In the past, positive copper price shocks, even when nowhere near those being projected today, tended to shift the policy stance in a negative direction, notably increasing current expenditure unsustainably. The authorities have invariably returned to the drawing board when their revenue projections have failed to materialize or when the copper boom has subsided. Such policy swings have been damaging for investors and the country in terms of return on investment, jobs, and revenue, and have eroded the government's credibility. Perhaps most concerning, no lessons of experience appear to have been garnered, with the government seeming to begin from scratch with each new mineral revenue policy intervention.

1.3 Towards a sustainable mineral tax regime

This paper advances the following measures towards Zambia's pursuit of a sustainable mineral tax framework for revenue generation:

First, an effective mining tax policy must be context specific and not applied mechanistically or allowed to swing unduly in response to domestic political pressure. Although Zambia's focus has decidedly been on mineral revenue enhancement, simply raising taxes has not necessarily translated into higher or sustainable mineral revenue for the government. Experience suggests that it is continuity in mining production, which requires a stable operational environment for the mines, that ensures a steady stream of tax revenue rather than the level of the tax rate for mining itself.

Second, while mining companies will take advantage of all available tax loopholes to maximize their profits, the onus is on the government to enforce a high level of tax compliance. Hence, the capacity of the Zambia Revenue Authority (ZRA) to prevent tax avoidance and evasion among mining companies must be strengthened. This may require the creation of a dedicated and influential tax unit for the mining sector at ZRA, possibly led by a commissioner. Moreover, better communication on mining policies and outcomes between the Ministry of Finance and ZRA could help minimize the sense of disarray that often characterizes policy statements on mining during copper booms and busts.

Third, and related to the last point, Zambia needs to develop strong capacities in the line ministries for financial and production audits, business negotiation, sector analysis, and output projections. The mining companies deploy highly skilled teams during negotiations with the government and have vast experience with respect to operational issues. The Zambian state must raise its technical competences at a rapid pace to address its capacity constraints with respect to the revenue and structural challenges posed by the mining industry. If the amount of copper being mined is not known with any degree of certainty, it is near impossible to project revenues with confidence.

Fourth, Zambia has witnessed several mid-course swings in incentives to the mining companies, often in response to changes in domestic politics, which have affected investment in the mining sector. As loss of mineral production capacity is difficult to recoup in the short term, the government should focus on preserving a robust level of output amidst booms and busts in mineral prices and shifting domestic politics.

Fifth, the ownership of Zambia's mines remains a portentous political challenge in the country and resolving it will be key to enhancing mineral revenues, maintaining the stability of operations, and the successful execution of structural reforms in the mining sector. Today, the Zambian state is the largest single owner of the mines but its role in their management is scattered and largely passive. As a start, increasing the share of local ownership (private and public) of Zambia's mining assets, including through joint ventures, could cure the perennial fears in the country over revenue dissipation and capital flight, enhance corporate social responsibility in mining, and assuage some of the pressures of resource nationalism (Caramento and Saunders 2019).

Sixth, as has happened in neighbouring countries, and to some extent in Zambia before the mining sector was nationalized, mining tax policy can be used to strengthen inter-sectoral linkages, increase value addition downstream, boost industrialization, and incentivize local ownership of parts of the mining industry. Although these issues have received relatively limited attention in recent decades, their importance will increase rapidly as Zambia seeks to address the changing situation in the mining sector as it responds to an unprecedented global demand for copper and cobalt.

Seventh, fiscal pressures often lead to drastic changes in the mineral code. A revenue stabilization fund could help alleviate them, while an offshore sovereign wealth fund could help bolster the country's international reserves. Both could reduce the country's vulnerability to external shocks and reduce the need to resort to extraordinary revenue generation measures, including raising mineral taxes during a recession in a bid to balance the budget.

1.4 Outline of the rest of the paper

The rest of the paper proceeds as follows. Section 2 provides a conceptual discussion and overview of mining policy issues. Section 3 discusses the case for changing Zambia's fiscal revenue policy. Section 4 looks at the lessons that Zambia could learn from the experiences of other mineral-rich economies, notably its neighbour Botswana. Section 5 examines the feasibility of creating a new

Zambian mining company/vehicle which could be listed on domestic, regional, and global stock exchanges (e.g., in London or Johannesburg) to attract new capital infusions and ideas into the mining sector. Section 6 discusses the imperative of building capacity within the public sector in Zambia targeted at better implementation of mining revenue policies and improvement of the effectiveness of the ZRA. Section 7 concludes with several recommendations for sustainable mining revenue generation in Zambia.

2 Mining revenue policy in Zambia: key issues

2.1 Mineral taxation for a competitive regime

A country's tax regime ultimately determines the success of its mining operations and must be chosen with care. Moreover, it is important for policy makers to secure stability and transparency in the mining tax code as part of the country's competitiveness strategy. An unpredictable tax regime is bound to discourage investors, as has happened in Zambia and many other African countries in the past. In a recent report, the Chamber of Mines of Zambia (2019: 6) argued that 'a good mining tax regime encourages investment—or at least is neutral and does not discourage it; designing one requires a sound understanding of mining: it is capital-intensive, acknowledged to be high risk, and has exceedingly long lead times to profitability'.

Although stability is desired, it does not mean that changes in tax rates must be avoided at all costs. In the past, the absence of meaningful consultations on tax reforms eroded the trust between the mining companies and the government. The emphasis here should be on adequate consultation with stakeholders, including the mining companies, allied downstream business interests, trade unions, and central and regional bureaucracies, during the preparation and implementation of the tax measures (Kayizzi-Mugerwa 2020). A less confrontational tax climate for mining will require rules targeted at enhancing clarity and simplifying the regime. It should be characterized by fewer exemptions and tax holidays, while allowing for the fair treatment of mining companies in terms of capital allowances. Such an approach would drastically reduce transaction costs for the tax authorities and taxpayers, with the overall goal of raising compliance.[1]

Despite its assumed simplicity and potentially broad base, as it is payable from the first day of production, the mineral royalty tax (MRT) in Zambia has been quite contentious. Although Zambia had allowed the deduction of MRT from corporate income prior to 2019, its removal, contrary to the practice in other mining jurisdictions, was contested by the mining companies. The new changes increased the effective tax burden in mining from 65 per cent (about the same then as the Democratic Republic of the Congo (DRC)) to 93 per cent. Moreover, the mining companies contend that a flat MRT assumes that production costs are evenly distributed across mines, which, given the age of the mines, ore quality, and hence variance in productivity, is not the case.[2] In the face of serious domestic economic and political undercurrents, from 2019 onwards, the government was reluctant to address this issue. Zambia became an outlier with respect to mining taxation in the region and globally (Chisakulo and Kambani 2018; Manley 2013a, 2013b, 2017).

[1] Bloomberg (2021) reports that the new United Party for National Development (UPND) government has indicated its willingness to discuss mining taxation and related issues with the mining companies as soon as possible. The goal is to unlock up to US$5 billion in investment in the mines in the medium term.

[2] The Report of the Chamber of Mines of Zambia and International Council of Mines & Metals (2014: 34) indicates large cost differences between mines, with implications for production strategies for individual companies.

In the report by the Chamber of Mines of Zambia (2019: 14), out of 12 countries surveyed, including African countries (South Africa, Botswana, and DRC), only Zambia had a policy of non-deductible MRT against corporate tax. However, in mineral revenue matters, good negotiations are everything and the government should maintain the MRT subject to discussions with the mining companies to arrive at rates and scales that provide a fair return for both sides. Given the heightened political pressure in the country over mineral revenues, such conversations have been rare in the past. It should be noted as a mitigation, however, that the high effective tax rates noted for Zambia above were often only on paper, as many mining companies circumvented them. In terms of lobbying for the interests of the mining industry, the Chamber of Mines of Zambia has been more effective in passing on messages to influential groups than the government has been in justifying its policy stances.

In 2008, the windfall tax proved useful in raising mineral revenue in Zambia, even as the global economy was entering a financial crisis of large proportions. Given the current positive outlook for copper prices and the vagaries of other tax forms, it could serve the country well to have a well-drafted windfall tax proposal, subject to transparent negotiations between parties, to ensure that the government gets a fair share of the projected revenues. Such a tax, as opposed to the MRT, need not be permanent and would not be required outside mineral price boom periods. However, if future copper prices are sustained for long periods, Zambia could consider the creation of a sovereign wealth fund and/or a revenue stabilization mechanism to limit the effects of mineral price variability on revenue and to ensure that minerals have perpetual benefits for the country (AFRODAD 2016; Economic Association of Zambia 2015).

2.2 Changes in ownership have not raised mineral revenues significantly

The privatization of the Zambian mines at the end of the 1990s was expected to boost revenue flows and lower Zambia's indebtedness (Mwaba 2004). However, while investment in the mines and their production increased markedly during the 2000s and onwards, the revenue performance was not satisfactory from the government's point of view. This was partly a result of path dependence, with the old tales over mining company exploitation dying hard. Although mineral revenues had obviously improved compared to the late 1990s, the government expected a return to the buoyant 1960s and a more visible boost to the Copperbelt and the whole economy. Instead, the privatization of the mines became a cautionary tale of how economically and politically intricate managing mineral assets in Zambia can be (irrespective of ownership regime).

Ironically, Anglo-American, the former owners of substantial portions of the copper mines in the 1960s, were the first to acquire sizeable mining assets in Zambia in 1999, renamed Konkola Copper Mines (KCM).[3] Anglo-American failed to turn KCM around, however, and it was soon acquired (2004) by Vedanta Resources, which made commitments to recapitalize the mines, increase employment, support local suppliers, and provide social services to local communities as part of its corporate social responsibility. But, at a time of declining copper prices and increasing operational costs caused by the degraded infrastructure, Vedanta did not meet its obligations. This forced the government to embark on the liquidation of KCM (to protect value and employment).

[3] Anglo-American's legacy in Zambia remains contentious. An article on 'Avoiding Debt Default and Turning Zambia Around—at the Same Time' by Greg Mills (2019) of the Brenthurst Foundation, founded by Anglo-American in pursuit of social corporate responsibility, provoked angry commentary from the Economic Association of Zambia. It saw the article as an attempt by Anglo-American to 'advance ill agendas' including causing asset sell-off pressure in the country

Vedanta was thus unwittingly sucked into Zambia's copper-laced politics, with regional (the case has been heard in South Africa as per an arbitration clause in the shareholders agreement) and global repercussions (Vedanta is an Indian Company listed on the London Stock Exchange). In contrast, Glencore has reached a much more amicable solution with respect to its transfer of ownership of Mopani Copper Mines, which it acquired in 2000, with the government agreeing in January 2020 to take over 100 per cent of the mine's ownership. It will pay a nominal US$1 for the mines in return for assuming the debt of US$1.5 billion owed to the firm's parent company Glencore International. The loan will be repaid through an off-take agreement granted to Glencore International at the rate of 10 per cent of production over an estimated 10- to 17-year period, depending on the level of copper prices. Given the paucity of analytical capacity at the local level and the relative secrecy around the finer details of the deal, it is not clear how fair it was for Zambia.

At the end of the privatization programme, the bulk of Zambia's mining assets seem to have gone to foreign investors. However, ZCCM-IH owned an average of 20 per cent of those assets. The chaotic exit of two new mine owners from the Copperbelt in the past couple of years has inadvertently returned the government to substantial ownership of the mining industry—as noted above, it recently took over Mopani Copper Mines and KCM (although the matter is still disputed and in court). The Zambian state has unwittingly once again become the single largest owner of mining assets in the country today (Table 1), with implications for how the power of ownership will be exercised in the medium term and for the broader economy (see Box 2 on the proposed new mining company in section 5).

Table 1: Zambia: ownership of major mining assets, 2021

Mining assets	ZCCM-IH %	Partners/Investor shares %	
Mopani Copper Mines	100		
Kabundi Resources	100		
KCM[4]	20.6	Vedanta	79.4
Lubambe Copper	20	EMR Capital	80
Kansanshi	20	FQM	80
Lumwana		Barrick Gold	100
Chambishi	10	ENRC	90
Kalumbila		FQM	100
Chibuluma	15	Jinchuan Group	85
Luanshya	20	CNMC	80
NFC Africa Mining	15	CNMC	85
Copper Trees Minerals	15.58	Horizon Mining	87.42

Source: compiled by the authors from government and company sources.

2.3 Challenges of mining revenue policy in Zambia

Privatization and mining revenues

An overview of recent studies and reports suggests that, while a number of changes in Zambia's mineral revenue policy were technically (and politically) justified, especially during the copper boom of the 2000s, in implementation the process was unremittingly haphazard, politically affected, and, hence, subject to incessant revision and reversal. This has been blamed on the delicate political economy of the mining sector in the country (i.e. 'Zambia was born with a copper spoon in its mouth'), with discussions on mine performance (as opposed to those on

[4] ZCCM-IH is in court proceedings with Vedanta to acquire 100 per cent interest in KCM.

manufacturing, agriculture, or tourism) easily escalating into national debates about the country's future. The absence of in-depth institutional capacity and expertise for administering, monitoring, and auditing key segments of the mining business—and hence failure of the government to take command of the debates and associated undercurrents—has also been an important extenuating factor (Lundstøl 2018; World Bank 2016).

The denationalization of the mining industry in Zambia which began in the late 1990s led to notable increases in copper production, but mineral revenues did not increase to the levels expected by the government, partly owing to the stabilization clauses (notably with respect to taxation) that were included in the development agreements reached between the government and the mining companies (N'gambi 2001). In a bid to increase revenues in a period of economic turbulence, since 2008 the government has instituted numerous changes in the mineral tax code, royalties, and reporting stipulations for the mining companies (Otto et.al. 2006). Although Ndulo (1986: 2) noted that 'the principal aim of any country's mining legislation is to encourage the orderly exploration and development of its resources to maximize economic benefit', the fiscal regime for Zambia's mining sector has evolved in a quite erratic manner, failing to meet these objectives (Conrad 2012).

In retrospect, Zambian policy makers seemed to believe that, as the mining companies were conducting their businesses opaquely (i.e. hiding profits), a strident mining revenue policy that kept them on their 'toes' was required (Zambian Eye 2015). However, the government's measures generally failed to achieve their intended results, leading instead to mineral tax regime instability, investment reticence, and even more desperate efforts by the government to find a sustainable solution.

State-mining company relations and the benefits of policy predictability

The basic challenge of Zambia's mineral revenue policy today has become how to establish a practical and less acrimonious relationship with the mining companies, which, after all, are undeniably driving the mining sector and must be accommodated in some way, if only to ensure that production is not disrupted unduly. Despite the grievances over exploitation, there are several advantages of working with multinational corporations, given their access to capital, management skills, and technology, which must be harnessed. However, while the mining companies in Zambia demand 'fair' taxes, their greatest emphasis is on the 'stability' of both policy and domestic (political) perceptions. The fights between the government and the companies over revenues have had a major influence on domestic public opinion, with feedback effects on public policy and mining legislation. The swings in mineral tax policies witnessed over 2008 to 2010 were in response to a sharp increase and then collapse of copper prices. The size of the revenues, compared to the amount of copper being exported, sullied the public image of the mining companies—explaining to a large extent the change in popular sentiment, with calls in some quarters for the renationalization of the mines.

Sustainable mineral revenue generation is mostly a product of technical and rules-based approaches to mineral production which emphasize managerial and technical innovations and competences. An over-reliance on 'resource nationalism' to garner quick results, a frequent feature of Zambia's approach to mining, does not make for good or sustainable policy. The failure to create a robust domestic capacity for data collection and analysis of mining production and other activities meant that policies were driven by guesstimates and, not least, innuendo. Lessons of experience from the Southern African region (notably South Africa and Botswana) and farther afield (Chile) suggest that for Zambia to achieve its mineral revenue potential, while managing copper price shocks more expediently than in the past, will require a more predictable, fact-based,

and less risky operational environment for the mining companies (Chishimba 2016; KPMG International 2013; Ruiz-Dana 2007).

2.4 Opportunities for revenue generation in the emerging green economy

This paper was written during the second year (2021) of COVID-19. Zambia's economic prospects deteriorated markedly over 2020 following the onset of the pandemic, rising indebtedness, and the Eurobond default in September. The year also saw the renationalization of some mining companies. The economy, nevertheless, had a new lease of life as copper prices experienced an unprecedented rally during 2020 and 2021, after an initial drop as the pandemic accelerated. Globally, the drivers of the price boom include quantitative easing by central banks, which massively increased liquidity and speculation in all commodity markets; fiscal stimulus in the advanced economies, especially via infrastructure investment ('building back better'); and increased momentum behind climate change policy and investment to transition the world to 'net zero.'

The green economy will comprise solar and wind power (and large-scale battery storage), electric vehicles (EVs), and zero-emissions buildings. This all favours the global metals sector, especially copper and cobalt. It is estimated, for example, that on average each EV requires some 20kg of copper wiring and this is on top of the recurrent need for metals in the modern economy, including the infrastructure of the digital economy (World Bank 2020).

This unprecedented opportunity to 'cash in' should not be taken for granted and, to be harnessed, will require careful preparation across the board. It must also be recalled that a booming copper sector has never been quite enough as a development motor in Zambia. As well as creating white elephants on the Copperbelt, copper production has been known to distort the government's expenditure patterns and to encourage the development of a decidedly capital-intensive industrial development strategy, with limited job creation (Adam and Simpasa 2010). If Zambia enters this potentially affluent phase with little institutional preparation, the impact on mining operations and the broader economy may not be too different from the past.

There is an opportunity for Zambia to embark on climate-smart mining strategies to help it avoid the looming environmental trap (especially with respect to energy and water consumption) once the new heightened mining regime is operational, which an intensive search for new mineral deposits might imply. But even here, the rapid creation of domestic capacity and expertise will be of paramount importance.

2.5 Local capacity question

As noted above, Zambia's mining policies often fail due to a lack of domestic ability to implement, monitor, and undertake mid-course corrections when difficulties arise. There is an over-reliance on international consultants, with little or no effort put into growing Zambia's own ability to undertake such tasks over the medium to long term (Chamber of Mines of Zambia 2018, 2019; Chanda 2017). This lack of local technical policy expertise, including within the line ministries, makes it almost impossible to establish communities of practice for conducting crucial tasks such as financial and production audits or detecting the use of transfer pricing by the mining companies. If adequately incentivized, Zambia has several local universities and consultancy companies which could undertake the consultancy work needed to assess mining industry performance and conduct related technical analyses.

In 2015, a project (supported by the European Union) was launched to expand the ability of the Ministry of Mines and Mineral Development (MMMD) to monitor mineral production, including gathering production data and creating a better production data interface between the Ministry

and the ZRA, to enhance mineral revenue. The project ended in 2019 after four years of operation. It helped to improve capabilities within the MMMD, notably the Geology Survey Department and its chemical and gemmological laboratories, improved reporting formats (i.e. introduction of 'Form 34' to capture activities at the mine level), and it enhanced its physical presence during the exploration, extraction, processing, and export stages of mining activities. The private sector welcomed the project as it helped to dispel the claims that Zambia was losing up to $3 billion dollars annually in tax evasion by mining companies, including undeclared mineral production and illegal exports of minerals. The project has reduced the possibility that mining companies will under-declare production and the risk of them being overcharged by the government for mineral royalties.[5]

3 The case for bolstering Zambia's mineral fiscal regime

3.1 Zambia as a policy and revenue outlier

Zambia has been an outlier in formulating key aspects of mineral legislation (for example with respect to royalty payments and their non-deductibility from corporate income for tax purposes). There is no evidence that the experiences of countries such as Botswana, South Africa, and, from further afield, Chile, often cited in Zambian policy analyses and statements as examples to emulate, have influenced policy-making in Zambia to a significant extent.[6]

Although Zambia's mineral tax regime has changed ten times since the mid-2000s, i.e. at least once every two years on average, achieving the goal of establishing a stable fiscal regime for the mining sector has remained elusive. Researchers have blamed this, as noted, on institutional weaknesses and political interference. They see the fiscal regime as not being simple, providing little certainty to the mining industry, being inefficient, and crucially lacking the flexibility that operations in risky environments require to thrive. Each new attempt to get fiscal policies right has met stiff resistance from the mining companies and other parts of the business sector or has been derailed by exogenous mineral price shocks (Lundstøl and Isaksen 2018; Otto 2018).

Enhancing mineral revenue is what drove the nationalization of the Zambian mines in the 1960s and their renationalization 30 years later (Sikamo et al. 2016). Zambia's share of global copper production declined precipitously during the three decades of state ownership, from 13 per cent in the 1960s to 2 per cent in 1999, with revenue following suit. By 2020, twenty years after the mines were privatized, Zambia's share in the global production of copper had improved to 5 per cent, registering a total output of the metal of 882,061 MT, but much below the shares it commanded in the post-independence decades (Mfula, 2021).

However, Lundstøl and Isaksen (2018: 22) found Zambia's approach to taxing large mineral companies to be 'both understandable and justified from an economic point of view'. In their view, the intransigence of the mining companies and unbalanced power relations have made it difficult for Zambia to undertake meaningful and timely consultations on mineral tax matters, and unilateral mining legislation has been the only viable recourse. Still, absent a counterbalancing

[5] See Lusaka Times (2019).

[6] Martin (1972) notes that Sardanis (2015) studied Chile's actions in taking control of its mines before Zambia's *Matero* reforms of 1969, which preceded the takeover of the mines in the Copperbelt.

ownership presence or other sources of investment in the mines, arbitrary tax policy actions lower investor confidence and hence are ultimately counterproductive.

The Chamber of Mines of Zambia (2018) estimated that, as a consequence of structural and policy disruptions experienced by the mining sector over past decades and the insecurities felt by investors as a result, some 300,000 MT in copper output per year was permanently shaved off the production frontier. Hence, absent these disruptions, today's annual copper output could be hovering around 1.2 million MT. This production gap implies a potential loss of royalties of up to US$300 million per year. While the latter figure is astounding, it can be understood when comparing the experiences of Chile and Zambia in the past half century (Chishimba 2016). Both countries were producing about 700,000 MT of copper in 1970. Fifty years later, Chile produces eight times more copper than Zambia, while, following denationalization and related reforms, the latter's production volumes are only now returning to where they were five decades previously. In 2020, Zambia's per capita income at US$1,300 was less than a tenth of that of Chile.

3.2 Two decades of searching for a workable mineral tax regime (1999–2020)

Since Zambia's mines were denationalized at the end of the 1990s, the government's mineral revenue policy has been eclectic, focused on meeting the revenue needs of the day (Box 1). However, in its attempts to plug revenue loopholes, it has watched mining companies closely throughout this period.

Constraining stability clauses (1999–2007)

Between the late 1990s and 2007, when the transfer of mine ownership to the private sector intensified (denationalization was protracted, taking a decade to complete), a parallel and sharp increase in copper prices and FDI raised copper output threefold compared to the era of state ownership of the mines. Moreover, the higher copper prices sharply revalued the mines on the Copperbelt (KCM was purchased for US$25 million versus the asking price of US$400 million in the mid-2000s, for example). Although the government had expected to receive a considerable portion of the copper windfall in terms of revenue, this was precluded by the sustainability clauses it had agreed with the new mine owners. Notably, KCM extracted a 0.6 per cent royalty tax and 100 per cent capital allowance from the government.

Thus, although the government would have wanted to rid itself of the mines at any price in the 1990s, the dismal revenue increases post-privatization irritated it and the population greatly. The fairness of the pricing of Zambia's mining assets was consistently questioned, especially considering high copper prices and the buoyant annual reports of the mining companies, as was the goodwill of the countries where the multinationals operating in the country's mines were domiciled for tax purposes.

Box 1: Macro and political economy aspects of Zambia's mineral revenue policy

Macroeconomically sound: A review of mineral policy legislation and individual tax codes from 2008 onwards reveals a weak link between mineral revenue policies and broader macroeconomic concerns. Efficient tax systems seek to maximize revenue but with a focus on sustainability (and avoidance of distortion). Under revenue pressure, the government has often sought countercyclically to increase tax rates during copper price collapses but did not go far enough during price booms. On the other hand, mining companies complain incessantly about high taxes, although only a few of them met their tax obligations in full at any given time during recent decades. As currently conceived (often as a fire-brigade operation) Zambia's mineral revenue policy is not targeted at increasing long-term investment, boosting employment, or encouraging downstream value addition. These require a more thoughtful and sustainable approach, which has not so far been the case.

Neutrality of measures: Given the previous points, and the dominance of foreign companies in mining, the government tends to use more stick than carrot in dealing with the mining sector. The focus on revenue maximization has also obviated other concerns such as the transfer of technology and those of the localization of the mineral value chain—which could, with time, prove to be useful generators of revenue. Job creation is generally perceived as a sideshow when discussing mineral revenue and yet the two are intimately linked given the links between production technologies and cost structures.

Mineral tax administration: The creation of the ZRA was welcomed as an important institutional innovation. However, the agency has faced a steep climb with respect to dealing effectively with the complex tax issues of the mining companies. It is also doubtful whether an agency squarely focused on revenue maximization, as it is, can respond effectively to the 'net zero' agenda and its implications for Zambia's mining sector (notably copper and cobalt). A new unit (think tank) focusing on addressing the technical and policy challenges arising from the demands of the green economy will be required.

Encouraging corporate responsibility: Thus far, the mineral tax code's influence on corporate responsibility in Zambia is coincidental, with the behaviour of mining companies influenced more by stakeholder pressure, including from the non-governmental organizations (NGO) community over tax or environmental issues (Mondoloka 2018), than through the government's taxation policy per se. However, tax codes, if well deployed and managed, can be powerful means for shifting economic incentives. Engendering the latter will be important for rolling out the climate-smart mining which is the way of the future.

Ensuring political feasibility: Given the mining sector's political symbolism and concentration of activities on the politically influential Copperbelt, the political feasibility of mineral revenue policies still weighs more heavily there than in other sectors of the economy such as tourism and agriculture. Still, engendering a high tax morale among mining companies while also promoting social corporate responsibility (i.e. job creation) might be a tall order.

Diversification question: There is also the question of whether a well-designed mineral revenue policy could contribute to sector diversification or to downstream value addition in Zambia. The government seems to think so, as it announced in the 2021 Budget speech that measures would be introduced to encourage Zambians to invest in that part of the economy.

Source: compiled by the authors.

Levelling the playing field with difficulty (2008–14)

The Mines and Mineral Development Act of 2008 was the government's attempt to address the mineral revenue issue in a firm manner and to end policy instability. First, the government eliminated the 'fiscal stability' clauses that it had agreed with the mining companies earlier in the privatization process. The 2008 Act also involved changes in the mineral royalty (which rose to 3 per cent) and withholding tax rates (15 per cent on interest, royalties, management fees, and similar bases) as well as in capital allowances (reduced from 100 per cent to 25 per cent with a given year). The tax changes introduced by the 2008 Act saw the average effective tax rates rise to between 64 and 96 per cent (versus an intended average rate of 47 per cent). Other important elements of the package included limitations on carrying forward losses for tax purposes; prices for taxation purposes based on nominal prices (quoted at a recognized international metal exchange such as the London Metal Exchange); and ring fencing the tax obligations of the new mines. However, the most important element of the package, about which much has been written (Banda and Besa 2020; Clausing and Michael 2015; Fjeldstad et al. 2016) was the progressive 'windfall' tax imposed on copper and cobalt prices.

The changes in tax rates invariably yielded less revenue than the government expected, partly because copper prices had fallen in the interim. In 2012, the royalty rate doubled to 6 per cent, the export duty on copper concentrates reduced from 15 per cent to 10 per cent, and the rate on hedging income was set at 35 per cent (KPMG International 2013). A capital allowance of 25 per cent over four years was re-introduced in 2013 for mining operations, whereas the 100 per cent allowance for prospecting and exploration was maintained. As Siwale and Chibuye (2019) observed, the tyranny of indecision, leading to sudden shifts in tax legislation, has been a key characteristic of mining tax policy in Zambia.

Innovating aggressively (2015–19)

Despite fiscal incentives, mining employment has typically fallen steadily in Zambia as the new investors substituted labour for machinery and other capital goods in response to incentives under the fiscal regime. With employment falling but output rising, revenue and foreign exchange generation were the real justifications for the mining operations.

In 2015, following wide-ranging claims of fraud and tax avoidance in the mines, the government restructured the mining tax regime, replacing the profit-based tax system with a simple mineral royalty-based regime set at 8 per cent for underground mining and 20 per cent for open cast mining. Remarkably, the variable profit tax for mining and the corporate income tax were abolished. The government ultimately lowered the royalty rate to 6 per cent for underground mining and 9 per cent for open cast operations. Meanwhile, the variable profit tax and the corporate income tax were re-introduced at a rate of 30 per cent for mining operations and 35 per cent for processing. For tax purposes, the carry-forward of losses was limited to 50 per cent of taxable profits.

Further changes to the mineral tax regime were announced in April 2016, when a MRT (ranging from 4 to 6 per cent), charged on a copper price scalable basis, was introduced and the variable profit tax was removed. In 2019 the sliding mineral royalties were adjusted once again, with the base rate being raised to 5.5 per cent and the highest rate to 10 per cent, as shown in Table 2.

Table 2: 'Sliding' mineral royalties for copper, January 2019

Price range in US$	Rate
Less than US$4,500	5.5 %
US$4,500 but less than US$6,000	6.5 %
US$6,000 but less than US$7,500	7.5 %
US$7,500 but less than US$9,000	8.5 %
US$9,000 and above	10 %

Source: authors' compilation from Zambia Revenue Authority (2020).

In addition to mineral royalties and income tax, the government levies value-added tax (VAT) (the prevailing rate is 16 per cent) on all equipment imported for mining operations. This is subsequently refunded by the Treasury, although VAT refunds are slow, which is a source of considerable irritation to mining companies.

Optimism once again (from 2020 onwards)

Much higher copper prices since 2020 have once again given hope to Zambian mining. However, the structural and policy constraints that have characterized Zambian mining for decades must be addressed if the country is to enjoy sustainable benefits from the new mineral windfall. There is otherwise a danger that the mineral boom will just help to sweep the country's large structural problems under the carpet for a while, only for them to re-emerge when it is over. However, if carefully exploited, the improved business environment unleashed by the mineral sector's improved prospects could provide the resources needed to push mining operations, and hence revenues, towards greater sustainability.

3.3 Ending debate about mine ownership in Zambia

Zambia's mines are a politically emotive issue, and it is difficult to see a situation in the future where foreign dominance on the Copperbelt can be accepted as a matter of course. With the rampant disfunction of the once ubiquitous Zambia Consolidated Copper Mines (ZCCM) a distant memory, Zambians now argue that the dismantling of state ownership of the copper mines has cost the country too much in terms of technical and human capabilities, revenue, and employment and that a type of restitution of state ownership is required. While total state ownership of the mines may not be desirable today, the government, the argument goes, must retain a strategic stake in the sector, as in South Africa and Botswana where governments have used their ownership of parts of the mining industry to maximize revenue (Economic Association of Zambia 2015). The joint venture between the Government of Botswana and De Beers is, for example, credited for a high and stable flow of revenue to the state.[7]

To enhance its influence in the mining sector, the government has been slowly but steadily acquiring shares in mining companies and associated ventures through its holding company, ZCCM-IH. The government's recent acquisitions of Mopani Copper Mines (MCM) and KCM (still in litigation) have solidified its presence in the mining sector. However, the Chamber of Mines of Zambia (2018) has estimated that it takes almost a decade and considerable investment to bring a new mine to full production, while rehabilitating an existing one takes up to half that amount of time. As mining investments are lumpy and high risk, with limited opportunity for calibration or for changing direction once the operations have commenced, this will constrain the government's

[7] Ironically, Anglo-American, a force to reckon with in its home base of South Africa, which many Zambians see as the main culprit in the disruption of their country's mining industry (see footnote 1), is a majority shareholder in De Beers, in which the Botswana government also holds shares.

ability to change things radically in the mining sector in the medium term. However, if things are to change in the mining houses, the government must be more willing to exercise its power of ownership (see Box 2).

4 Lessons from other mineral-rich countries

4.1 Perspectives on mining investment and policy attractiveness

This section of the paper looks at lessons of experience, notably from Botswana, that Zambia can draw on as it crafts its own mining tax policy strategy in the period ahead. A challenge that all mineral-dependent countries face is how to balance mineral revenue generation and the importance of preserving the competitiveness of the mines, given that there is limited domestic capital, mineral projects have long lead times, and multinational companies have several potential investment destinations to pick from globally.

Annual surveys by the Fraser Institute (various years) show that the nature and quality of public policy in the various jurisdictions across the world matter for the mining companies' willingness to invest. Drawing on these surveys, which include data for Zambia and several countries from Southern, East, and West Africa, we derived two tables: Table 3 on mineral investment attractiveness and Table 4 on investor perception of national mining policies, as a form of 'report card' to governments.

As expected, Botswana is ahead of other African countries with respect to investment attractiveness (Table 3). From the broader African perspective, the attractiveness of Zambia's mineral investment has been mediocre over the past decade, with the exception of 2016 when the government presented a royalty tax scheme which was well received by the mining companies but not implemented until 2019. Mining companies have, for example, not ranked the country much higher than neighbouring DRC, Tanzania, or Zimbabwe.

Table 3: Selected African countries: mineral investment attractiveness indices: 2016–20

Mineral jurisdiction	2016	2017	2018	2019	2020
Botswana	77.62	63.14	71.66	63.39	81.48
Burkina Faso	68.18	52.64	**	61.19	59.68
DRC	72.80	61.51	54.92	39.20	58.12
Ghana	75.56	72.13	54.91	**	71.85
Mali	69.32	70.74	62.18	39.53	76.27
Namibia	66.11	60.67	56.66	58.22	59.72
South Africa	53.62	62.06	65.30	64.79	56.33
Tanzania	60.45	46.79	55.04	32.82	42.08
Zambia	72.78	59.34	63.60	37.90	60.83
Zimbabwe	41.84	54.32	56.57	44.81	49.52

Note: ** data missing.

Source: authors' compilation from Fraser Institute (various years).

For Zambia, the annual scores portray the swings in investor sentiment that we discussed above—many emanating from abrupt changes in mineral taxes. The low score for 2019 reflects the difficult situation that the country was experiencing both with respect to escalating debt and low mineral prices and the government's decision to change the royalty rates, raising the band from 5.5 to 10 per cent depending on the copper price levels. Tanzania was the only country with a lower

investment attractiveness score than Zambia during that year, having put stringent mining policy measures in place to prevent the 'loss' of revenue from its tanzanite mines, which displeased the international mining community.

Table 4: Selected African countries: mining policy perceptions indices: 2015–19

Mineral jurisdiction	2015	2016	2017	2018	2019	2020
Botswana	88.29	91.79	82.84	94.77	83.48	91.20
Burkina Faso	71.90	72.37	62.84	**	55.48	61.70
DRC	42.74	60.58	35.03	34.18	38.00	53.64
Ghana	**	81.76	64.42	62.27	**	74.62
Mali	60.86	65.48	66.86	60.00	45.27	78.18
Namibia	80.70	77.77	71.11	80.71	87.22	74.30
South Africa	51.91	47.50	42.66	64.57	59.71	60.81
Tanzania	62.12	66.13	45.11	56.83	28.47	48.94
Zambia	62.69	73.61	53.34	65.25	38.50	64.56
Zimbabwe	24.67	18.06	29.54	47.68	26.31	39.42

Note: ** data missing.

Source: authors compilation from Fraser Institute (various years).

In a review of public policy in Zambia, Collier (2014) suggested that the country's increasing democratic space, allowing for competing domestic points of view, has tended to make the country's mining policies less amenable to mining company pressure, but also much more volatile than in other countries. This seems to be supported by Table 4 on policy perceptions in mining. Mining companies gave relatively high scores for public policies in Zambia in 2015 and 2016 as the government had embarked on a sliding royalty tax scheme which the mining industry supported. However, the scores decreased sharply in 2019 as implementation failed.

4.2 Is Botswana's diamond experience replicable?

Although Botswana and Zambia are neighbours, their mining revenue policies and their impacts on economic development and social welfare have differed markedly from the 1960s (Matshediso 2005). While both have depended heavily on mining for economic development and social stratification since independence, Botswana is today a thriving middle-income economy, where the mining sector contributes more than one-third of gross domestic product (GDP), over 45 per cent of revenue, and 75 per cent of export earnings. On the other hand, Zambia, where mining contributes 12 per cent of GDP and 70 per cent of exports, hovers on the verge of relegation to the low-income economy category (from the low-middle-income one where it has 'sat' uncomfortably, due to economic swings, for a decade). Botswana's population of about 2.3 million is only 12 per cent of Zambia's population of 18.5 million.

Overall, Botswana's mineral policy aims to: (i) accelerate the prospecting and development rate for new mines; (ii) encourage activities that add value and enhance linkages with the rest of the economy; (iii) boost domestic capacity through technical and on-the-job training; (iv) create employment opportunities for citizens; (iv) promote the exercise of social corporate responsibility by mining companies vis à vis the host communities for the mines; and (v) minimize the negative impacts of mining operations on the environment. While these broader policy goals do not differ much to those of Zambia, the difference is that in Botswana there have been serious attempts to achieve them.

For example, Debswana, the diamond conglomerate which the Government of Botswana owned jointly with De Beers, has a five-year high performance organization plan which systematically

monitors the company's performance on cost performance, project delivery, social performance, employee engagement, and overall commercial success on the one hand and impact on the environment, community outreach, health, and occupational heathy and safety.

Overview of Botswana's mining tax code

Royalty taxes feature in the policy mix but have remained fixed for a long time. As in Zambia, mineral royalties feature prominently in Botswana's mining tax code, with all mineral concession holders liable to pay royalties to the state. This is determined as a percentage of the gross market value of the minerals produced, defined as the sale value of minerals receivable at the mine gate in an arms-length transaction, without discounts, commissions, or deductions. This royalty is set at 10 per cent for precious stones, 5 per cent for precious metals, and 3 per cent for other mineral products. Importantly, the royalties are deductible during the computation of the company's chargeable income or net profits. This contrasts markedly with Zambia, where for a long time royalties were not deductible.

Royalties are well formulated, fully deductible from corporate income tax, and key sources of revenue in Botswana. Further, there is a mining capital allowance, which is computed in accordance with 100 per cent of the mining capital expenditure made in the year in which the expenditure was incurred. Regarding corporate taxes, the Government of Botswana devised a regime in 1999 which sets taxable income as a percentage of gross income, provided that the tax rate is not less than the company tax rate of 25 per cent, with a maximum theoretical tax rate fixed at 55 per cent. This allows the actual tax rate applicable to vary each year, subject to the profitability of the mining operation.

Other taxes levied include a dividend tax of 15 per cent on distribution to residents and non-resident shareholders and VAT of 10 per cent applied to all but zero-rated items, including taxes on exports of minerals. VAT refunds are only available upon re-export of items within six months of being brought into the country. On the other hand, Zambia initially opted to negotiate tax incentives on a company-by-company basis. Notably, Anglo-American, the first company to come in after denationalization began in 1999 (and with a history in Zambian mining, as discussed earlier) literally negotiated its tax obligations away. The government has since incorporated mining taxes into the general tax law.

Diamond industry

The diamond industry is subject to a different regime based on direct agreements between the government and the investors but distinguished by their long duration to provide investment stability. Nevertheless, the Government of Botswana has used every opportunity provided by the periodic renewal of De Beers' production agreements to renegotiate terms, with the former driving a hard bargain at every stage, reflecting the importance of strong capacity among negotiating teams to obtain the best outcomes for their countries (Jefferis 2009). This has enabled the government to, for example, raise its shareholding in Debswana (the jointly held diamond producing company) from 15 per cent to 50 per cent over the past five decades. Botswana and De Beers also jointly own (50–50) the Diamond Trading Company, established in 2006. Overall, the relationship between the Government of Botswana and De Beers has been mutually beneficial overall, with the incentives of both parties aligned to securing the long-term future of the industry. The country has secured a high proportion of mineral rents for its own benefit while allowing the investor a good return on capital and facilitating new investment in the mines.

The most recent long-term agreement (diamond production and sales agreement) between the Government of Botswana and De Beers was signed in 2011. A key commitment was to relocate

all the sales and operations of De Beers' Diamond and Trading Company International from London to Gaborone, which happened at the end of 2013. This has been a significant game changer for the country, making Botswana a key player across the global diamond pipeline i.e. directly involved in the prospecting, mining, cutting, polishing, and marketing of diamonds. Moreover, Debswana now allocates 15 per cent of its raw diamonds to the Botswana government-owned rough diamond seller Okavango Diamond Company, reputedly to help boost local capacities for 'market discovery'. In the most recent negotiations (2020) for renewing the mining licences for a further decade, the government secured commitments from De Beers to undertake more downstream value-added activities in Botswana. Still, in light of the COVID-19 crisis, the agreement was only extended for one year as discussions for a longer-term agreement continue.

4.3 Lessons of experience from Botswana's mining (revenue) policy

Caution in changing the mining code. For the sake of stability in the mining sector and overall, the Government of Botswana has taken a farsighted approach and been cautious in changing the mining code (De Beers Group 2019). For example, the post-independence mining code from 1977 was only revised in 1999. This helped provide a long-term horizon to investors and the government to establish strong institutions and regulatory structures. However, it negotiated hard with mining companies at entry using 'leverage points' when agreements came up for renewal to demand new concessions from the mining companies.

Eschew resource nationalism. While Botswana's mineral revenue policy was strongly anchored in socio-economic development, it broadly eschewed resource nationalism. Even as other African countries were nationalizing their mines, Botswana waited until the state had the capacity and resources to run important segments of the industry. Its goal was to provide a stable, investor-friendly framework for investors to earn a return on their risk capital. It ensured that the main diamond mining asset (Debswana) remained a 50–50 joint venture between the government and De Beers.

Rigorous fiscal framework, but simplicity of the mining tax code. Botswana crafted a rigorous fiscal framework which ensured that excess profits, or mineral rents, were secured for the state. Hence, unlike in Zambia, a mineral price windfall was not an extraordinary event that necessitated quick (and often sub-optimal) adjustments for its capture, as it was already presumed in the framework—allowing for smooth and mostly rancour-free fine-tuning of the tax rates. Additionally, it pursued a simpler tax code focused on tax, royalties, and dividends, without invoking other taxes such as export taxes or VAT.

Strong legal and regulatory structures. Given the problems (conflict) that diamonds have unleashed in several parts of Africa in recent decades, the efficient management of the industry in Botswana cannot be taken for granted. It has taken institutional acuity, demonstrated emphasis on transparency, and strong legal and regulatory structures to achieve this. While this is probably not something that is easily replicated, it is nevertheless a good demonstration of what needs to be done to achieve sustainable results in such a fickle industry.

Allow for time to develop capacities before escalating to more ambitious projects. Botswana (as in many other mineral-rich African countries) did not have the capacity to run a diamond (or mineral) industry at independence. However, the government did not rush into arrangements (rapid assumption of ownership) that saw mineral industries in neighbouring jurisdictions run into bankruptcy following nationalization but waited until there was sufficient institutional and business management capacity in the country before such steps were encouraged. This does not mean that there were no domestic debates in favour of a more radical pace of nationalization. It is to the policy makers' credit that the slower-paced transition to joint ownership (sometime referred to as one of Africa longest public-private partnerships), on which the current successes are based, won the day.

Obligations, including for the government, must be well specified. Botswana's mining revenue policy also unequivocally lays down the ownership structure of mining assets and mining operations (except for diamonds, where the ownership level and the terms of ownership are a matter for negotiation). On issuing a mining licence, the government can exercise the option of acquiring up to 15 per cent participation in the proposed mine (for which it pays directly if exercised but lapsing otherwise), including the right to appoint up to two directors to its board.

Strategic choice of ownership structure. Over the years, the Government of Botswana (Table 5) has crafted an ownership structure for its mineral sector that has worked well for the country and the others involved. It has strategically opted for a joint-venture ownership of the diamond business (50 per cent of Debswana is owned by De Beers). Likewise, it has a 50 per cent share in the local diamond trading business (the other half is owned by De Beers), while it notably also owns 15 per cent of De Beers. The pattern of state investments in the mining sector has allowed the government to derive royalties, taxes, and dividends, while also ensuring that the businesses are focused on generating healthy returns and are not distracted by disagreements over taxes or ownership. Furthermore, partial, or full ownership of the mining assets by the government or citizens is seen as a way to mitigate capital flight, which normally happens in resource-rich countries. Ndikumana and Sarr (2019) present evidence that resource-rich countries feature prominently among those with high incidences of capital flight. To a large extent, Botswana has been able to use its joint ownership of the mining sector, especially diamonds, to moderate capital flight.

Table 5: Shares of the Government of Botswana in mineral sector, 2021

Company	Share (%)
Debswana (jointly owned with De Beers)	50
Botswana Ash (jointly owned with Chlor Akali Holdings)	50
De Beers	15
Diamond Trading Company Botswana (jointly owned with De Beers)	50
Morupule Colliery (a subsidiary of Debswana)	80.8%
BCL (copper-nickel mine) (under care and maintenance)	94%

Source: extracted by the authors from official sources.

Seek out the best technical advice possible. From the 1960s, the Government of Botswana appreciated that it would take time to develop the expertise required to run the mines effectively and therefore sought the best technical and managerial capacities possible from wherever it could find it. It paid for additional high-level technical expertise where necessary to boost its negotiating teams. Even the latter cost considerably more at the time than comparable 'home-made' solutions; the results achieved by Botswana have shown that it was a prudent approach (Jefferis 2013). In recent years, Zambia seems to have adopted a similar approach of hiring top-level advisers (in its case a French Investment Bank) to assist with its debt issues.

4.4 Conclusion

Huge mineral endowments provide immense opportunities for rent extraction by both the country and the mining companies. While disagreements between parties are inevitable, they must be resolved amicably for the mutual benefits to accrue. Botswana has been more successful than other African countries in managing its mineral assets because it adopted a flexible and, in retrospect, farsighted approach that allowed for the steady development of domestic capacities and confidence before acquiring larger shares of the industry. It also recognized the importance of preserving mutual incentives and long-term agreements, thereby enabling the mining company (De Beers) to invest for the long term. The fact that Botswana's domestic politics were not as

variable as in neighbouring countries, and fiscal discipline was high, helped shield its mining sector from undue policy fluctuation (Pitcher 2012).

However, despite the all-round praise, the secrecy surrounding the agreements between the Government of Botswana and De Beers has caused concern among some civil society groups in the country, including the charge that De Beers has been financing the ruling party for years.[8] Still, Botswana is not your run-of-the mill plutocracy and, thanks to the policies that the government has pursued including generating a steady stream of mineral revenue, the majority of the population has been lifted permanently out of poverty.

5 'Fit for purpose vehicle' for Zambia's mining investments and growth

5.1 Vehicle to invigorate leadership and innovation in Zambian mining

Mining is a capital-intensive industry, with many governments and mining companies facing the challenges of how to finance mining operations on a daily basis. This section suggests that for Zambia to secure a stable and sustainable framework for financing mining exploration and development, and refurbishing existing mines, a new approach to mine ownership and operation will be required.

Four arguments to consider

First, the denationalization of the mines that was embarked on at the end of the 1990s, partly because it was loaded with expectations of returning to the buoyance of the 1960s, has not worked as well as projected, at least in terms of resuscitating domestic revenues, engendering fiscal stability, and promoting steady growth. The change of mining ownership has also failed to boost livelihoods in the mineral-producing regions of the country—notably the Copperbelt—and socio-economic as well as environmental problems have mounted there. It is time to consider approaches, not tried previously.

Second, in terms of changing direction, setting standards, and meeting commitments agreed with the government, not least with respect to the environment and other areas of social corporate responsibility, the mining sector is today, in the face of persistent headwinds, virtually rudderless. Much is expected of the sector in terms of providing resources to defray rising public indebtedness but, lacking strategic levers, it seems unable to respond to the multifarious demands from the economic and political spheres. However, the charge that mining companies resist mid-stream shifts in mineral revenue policies because they are not 'nationalistic' enough misses the point. These companies are in Zambia to maximize shareholder value, subject to existing (not future) legal stipulations. The development agreements that the government reached with the mining companies were legally arrived at and the consequences of abandoning them could not be easily dismissed, however justified they might have been. It is important, therefore, for the government to establish strong capacity in negotiation and analysis with respect to mining projects. It should also ask why mining companies seem to 'behave' better in other mining jurisdictions in the region

[8] See, for example, Kenneth Good's book *Diamonds, Dispossession and Democracy in Botswana* (Good, 2008), which led to his expulsion from his post at the University of Botswana. The book acknowledges the progress the country has made during the diamond boom but has a dim view of De Beers' exercise of its economic power, including financing Botswana's ruling party. On the other hand, civil society has played a more active role in Chile during the expanding of copper production, hence raising accountability in the country's mining sector, including over environmental issues. This has not been replicated in Africa's mining jurisdictions (African Development Bank 2016).

than Zambia and what it needs to do to enhance the attractiveness of the country to investors (Mondoloka 2018).

Third, given the shareholding currently held by ZCCM-IH in the various mining companies and its prospective takeover of leading firms, KCM and MCM, the Zambian state has become the pre-eminent shareholder in the mining industry, with the potential to bring considerable power to bear in changing the industry, notably setting standards, if it so desired. It might be a good time to give serious thought to what needs to be done to turn this latent power of the government into a solid basis for bringing about change in Zambian mining. However, it has exercised its power sparingly, probably over fears that the operational overreach of the defunct ZCCM, which created some of the problems that the country is encountering today, could reappear.

Fourth, and related to the last point, as Zambia's mining sector looks forward to the era of smart mining that has been necessitated by the pressures of the green economy and the 'net zero' agenda, there will be the need for a strong agency for innovation in the mining sector. The question is whether ZCCM-IH or a project of another configuration could play that role.

The case for a more assertive state-owned company in mining

While on the policy side the government is an indelible part of the mining sector operations, through its tax and related activities, its ownership of substantial parts of the mining industry is relatively silent. Although the government readily professes disinterest in directly running a fully-fledged mining company, saving itself from political headaches, there are several possible ownership configurations that could be considered to heighten state presence and influence in the industry while keeping it within the ambit of the private sector (for example, the pursuit of public-private partnerships). While arguments about the superiority of private over public ownership have made their rounds in Zambia, choosing either of the extremes might not work. For example, lacking local capitalists, the privatization of the mines, once praised as brave and forward looking, is now looked upon in Zambia as the wanton sale of family silver, especially since mining employment has been in decline even as mining production has increased.

However, if the government continues to be a passive holder of the largest shares in the mining industry, which is currently saddled by structural and policy challenges, there is a real risk of a permanent disruption of mining operations as investments dissipate and the privatization effort fails altogether. The challenges have been escalated by the demands of the green economy and the global 'net zero' transition.

ZCCM-IH: Unfolding the umbrella

Today ZCCM-IH, a scion of the indomitable ZCCM, which folded after the privatization efforts began 20 years ago, is a 'premier diversified investment company' focusing on mining. In 2021, it had shares in up to 21 companies. As argued above, this makes the company the biggest owner of shares in the mining industry but, given their distribution across firms, it has had relatively limited influence on actual operations.

More recently, ZCCM-IH has been on the process of acquiring large stakes or full ownership of two substantial mining assets (KCM and MCM). As announced by the Minister of Finance (2021) in the 2021 Budget Speech, the government is looking for strategic investors who would help improve operations, develop the mines, and support domestic supply chains. Moreover, he also announced the launch of a Zambia Gold Company to spearhead gold mining and trading activities. It thus seems that the government and the population have transcended the anti-government ownership phase. There seems to be considerable scope for studying realistic options on the table.

In looking ahead, mobilizing investment capital will be an important issue. While the government, as mentioned above, is eager to acquire strategic partners for the newly relinquished mines, it is important to realize that given its relatively low credibility, 'quality' investors might not be persuaded by its new arguments nor the range of incentives it might present, choosing to sit on the fence until the air clears. It is therefore necessary for the new government in Zambia to find a formula that enhances stability and long-term investment, and suppresses business convulsions, across the mining industry. Already, the new pro-business UPND administration is reaching out to the mining companies for a fresher and mutually beneficial approach to doing business. This must be accompanied by a broader debate on how to improve taxpayer culture and morale in Zambia.

5.2 Financing the proposed mining venture

Introduction

Zambia has a unique opportunity to use the two mines at Mopani and Konkola as instruments for reforming the mining industry and as pace setters for the reforms ahead. It must urgently expand capacity there to realize efficiency gains and service the debt owed to Glencore International. However, for ZCCM-IH or any other vehicle to be successful in bringing the two mines to full production will initially require at least US$1 billion in investment and much more as the work of mine rehabilitation and expansion commences. Given the government's fiscal constraints, the resources for this will come principally from the private sector. Aside from the strategic investor (joint venture with the government) that we are proposing, financing could also come from the floating of shares on the Lusaka Stock Exchange. The latter would appeal to the innate love of the mining sector among Zambians and may also attract emerging market investors from the region and farther afield.

Range of financing options

Debt financing. Debt financing for Zambian mining assets will not be feasible in the medium term as the government is in no position to act as a guarantor for any debts that ZCCM-IH would incur externally and locally. Although enclave and ring-fencing strategies could improve financing prospects, it makes sense to assume that new debt financing for these projects would be infeasible at this stage. Still, ZCCM-IH should consider corporate bonds as a source for investment funds. While debt financing for global mining may have declined since 2011, many lenders still display a considerable appetite for mining risk for both large-scale and smaller mining companies. Although issuing corporate bonds is a relatively expensive form of financing, issuing bonds on the domestic market requires limited due diligence.

Copper prices. If projections of copper price movements are to be believed, any well-run copper mining business will be able to make money in the medium to long term as the new copper super cycle takes hold.[9] Global copper prices edged over $9,000 per MT in May 2021 on the expectations of a post-COVID boost in demand. Goldman Sachs (2021) has projected that by 2025, the metal would be priced at $15,000 per MT. The positive outlook for copper makes investment in new mines and the expansion of existing ones attractive to both equity and debt providers.

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[9] At the 10th Zambia International Mining and Energy Conference, held virtually in May 2021, several participants, including government officials, alluded to the fact that copper was in a new super cycle and that everything had to be done to take advantage of the expected windfall.

Equity financing/joint venture. Under equity financing, the options available are public equity through initial public offerings or follow-on-offerings , on the one hand, and private or state-owned investors including sovereign funds, pension funds, and other institutional investors, on the other. Within the latter category, mining operators could seek to partner with strategic investors with expertise in the industry through joint ventures (JVs), or financial investors seeking to broaden their portfolio to the sector for income growth. Equity financing has benefitted significantly from state-backed entities that are primarily investing in development stage projects. For Zambia, ZCCM-IH, which is seeking to raise financing including through strategic partners, can achieve this by inviting private and sovereign investors to take up equity directly in JV arrangements under its purview. Ultimately, success will depend on finding a well-respected international partner and allow them a high degree of control of operations.

Superiority of the joint venture. As we have seen in the Botswana case, the most beneficial form of ownership of mining assets for the major minerals is the JV, in which the investor and the government have an equal interest, or at least 50 per cent equity ownership. Under the JV, the investor and the government agree to share the successes and failures of the operations. It provides a platform for preventing policy excess from either side and works well if both sides are actively engaged in running the venture. It is less successful when the government is overly passive or, alternatively, too aggressive in the pursuit of its goals. But most importantly, joint ownership guarantees the government additional streams of income beyond taxes and mineral royalties, in the form of dividends. Botswana has perfected the JV approach, which has seen the country progressively secure up to 80 per cent of incomes generated by the diamond mines (Jefferis 2009). Zambia had adopted the JV approach after the *Matero Declaration* of 1969, when the government entered agreements with the mining companies for a 51–49 per cent ownership stake respectively (the plan was to pay off the government's equity over a 10- to 12-year period). This arrangement was, however, short-lived as the government borrowed substantial sums to pay off the private mining companies and take full ownership in 1973.

Box 2: On the proposed new mining company: nimble and flexible, not a state within a state

In Zambia, any suggestion of setting up a new mining company with majority state control brings back memories of the grandeur, but also inevitably unworkable social compact, that was the Zambia Consolidated Copper Mines (ZCCM) in its heyday in the 1980s and 1990s. Declared one of the world's most powerful companies by Fortune Magazine of the USA in the early 1980s and riding the crest of the copper boom, ZCCM epitomized the possibilities of 'guided' state capitalism, as well as those of a less contentious labour market (Zambian miners had generally toned down their wage and related demands to 'let our company prosper').

However, while ZCCM at its apex had assumed all the trappings of an influential global conglomerate, with private executive jets, company clinics, schools, and golf courses, it was also expanding its influence in the broader economy, including at one stage supplying all senior civil servants with new vehicles, as the government's own access to foreign exchange dwindled. It would also, on its own volition, offer at various times to import maize, the country's staple, and even petroleum products, using its more efficient procurement procedures and foreign exchange accounts. Although these actions were praised at the time as evincing a high level of patriotism on the part of ZCCM's leadership, they in effect demonstrated a weakness in the broader management of the company's resources (and the broader economy) that would eventually erode its effectiveness. There seemed to be a quid pro quo between ZCCM and the government that its 'gifts' would essentially relieve it of the obligation to generate healthy profits and tax and royalty revenues.

While ZCCM-IH, the successor to ZCCM, is essentially a holding company today, it is already the biggest owner of mineral assets in Zambia and is in the process of expanding its power and reach by adding two big mineral houses to its portfolio (although with plans to divest them as indicated above). Whether the

proposed new mining company we are proposing here will emerge from ZCCM-IH or be a new construct entirely, it cannot be encumbered with the multitudinous social obligations, including indulgence in quasi-fiscal operations, that had frustrated the work and ultimately eroded the effectiveness of the old ZCCM.

There is little doubt that if the goal of the new government (which ascended to power in September 2021) to double mineral production in Zambia in the medium term is to be achieved, there will be a need for heavy investment in the mines. Although with the change of power in Zambia economic sentiment has shifted and hopes for a solution to the country's debilitating debt burden have risen, the scope for the government to raise the funds needed to invest in the mining company (and the mines more broadly) will be constrained in the short to medium term. The recovery of the mining operations after 1999, required substantial injections of capital: annual FDI of $600 million annually after 2005, rising to over $2 billion by 2011. It will be important, however, to take a realistic approach to this certainty while also learning from previous experience, including when the government overshot with respect to the tax concessions it offered foreign mining conglomerates in the first attempts at the privatization of the mines.

In looking ahead, the new government will need to reassure the private sector that it understands that the mining sector thrives on a stable economic policy environment which enables investors to make long-term decisions. In this regard, a state-run company should not be an instrument for cutting corners and distorting incentives for other players in the market. The new political dispensation in Zambia provides the opportunity for the country to design a roadmap for the future of the mining sector, emphasizing stability, including clear perspectives on the prospects of the net zero agenda will imply.

Source: compiled by the authors.

In lieu of cash. Financing the government's acquisition of 50 per cent shares in the mining JVs could pose a challenge given the current status of the state's coffers. One of the solutions to this challenge is to value the land to be occupied by the mining companies, such that part or all of the government's equity participation is the value of the land acquired for the investment.[10] The government could also finance its participation through royalty or stream financing, by arranging off-take agreements based on its share of dividend proceeds and royalties until the capital is fully paid up. This is the model that Tanzania has adopted for its offshore gas finds spearheaded by Statoil and ExxonMobil.[11] Zambia should return to the *Matero* model crafted by late President Kaunda and Andrew Sardanis in 1969 to secure the country's resources in a win–win partnership with private firms, applied to both existing and new mines. It could well be that taking a backward step to a less politically constrained era in Zambia, with respect to the mines, might be what is required to move ahead in crafting a sustainable platform for revenue generation.

Due diligence. Attracting equity investments requires the companies to meet certain conditions, and this should be well established by investee mines and ZCCM-IH. Strategic and financial investors typically have remarkably high information demands during the due diligence process to help them understand the risks. The process can take a significant amount of time as internal approval has to be made, typically by management who may not be familiar with issues facing the mines. The process often involves advisers from both the investors and the mines. If care is taken to fulfil the due diligence required, the process will acquire the credibility that will hold it in good stead during turbulence ahead (it is inevitable in the mining business given the cyclical nature of the market), while also setting high standards in the whole industry.

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[10] This was also proposed by Akashabantwa Lewanika, an influential historian and politician, during a TV Bakwetu discussion (8 May 2021) hosted by Elias Munshya.

[11] See Ng'wanakilala (2012).

Listing on LuSe and other stock exchanges. ZCCM-IH could exercise the option of expanded listings on the LuSe, with possible cross-listing of the entities on other stock exchanges in the region such as the Johannesburg Stock Exchange or the Botswana Stock Exchange.[12] Listings could raise sufficient resources to enable ZCCM-IH to retire expensive debt, as in the case of Mopani Copper Mines, while generating resources to meet the working capital needs to run the mines. Listed companies also command a certain level of clout in the financial markets, as we show later, because they are seen to have strong governance cultures and transparent financial operations (Khama 2021). For example, companies engaged in mining and prospecting in Botswana are listed on the Botswana Stock Exchange (many also list in London, Toronto, and/or Sydney). This is important for Botswana institutional investors, such as pension funds, to take advantage of the evolving opportunities.

Stamp of approval from the IFC. ZCCM-IH could also improve its financing negotiations by securing equity participation from the International Finance Corporation (IFC), which makes a big difference for a company's ability to raise capital from other strategic investors. The IFC focuses on understanding the history and legal nature of the project, the shareholders and their sources of funds, the mining licences, and the links they have with key suppliers. The IFC is well aware that its involvement, subject to rigorous assessment of the investee and the project as part of its due diligence, including the specific project's social and environmental footprint, can provide an enormous boost to the project. The IFC also subjects reputational and corporate governance issues to due diligence, in line with anti-bribery and anti-money laundering legislation in many countries. IFC participation is hence an invaluable catalyst in crowding in capital from financial investors and other interests. ZCCM-IH should prioritize securing IFC equity to attract strategic partners, especially given the global lender's renewed focus on African countries in the post-COVID era.

Green economy financing. As noted earlier, copper's prospects are bound to improve markedly under the green economy agenda, where the metal is closely tied to the new technologies (including electric cars) that are being deployed to meet the 'net zero' stipulations of the climate agenda. However, the existing mining technologies are far removed from climate-smart mining and Zambia has a long way to go to meet international stipulations and become a centre of excellence in mining. However, there are several funding opportunities at the international level (UN, European Union Commission, World Bank, and the African Development Bank) which put strong emphasis on climate adaptation and mitigation and environmental sustainability. Besides, recent years have seen the emergence of environmental, social and governance equity funds which Zambia would be well positioned to attract if it pursues strategies in the medium to long term to bring it to the frontier of green mining.

5.3 Conclusion

It is ironic that Zambia would need to re-establish some state ownership of the mines to create stability in the industry and be in a position to address the mounting challenges in the sector, including how to respond to structural and capacity challenges and the emerging ones linked to the 'net zero' agenda. The hope that the mining sector would somehow self-regulate with the entry of reputable mining companies was not realized, nor was that of the gradual increase of local ownership (including through the local stock exchange) to defray the pressures of resource nationalism. However, while increasing the local stake in the mines will be crucial for industrial

[12] A number of mining houses including ZCCM-IH, FQMZ, Chibuluma, Kansanshi, KCM, and Mopani are listed on the Lusaka Stock Exchange although they are quite dormant, generating little turnover.

stability, returning to the statist approach of the post-independence years will not be the answer. The government should not divert from the active promotion of market forces as Zambia confronts the prospects of a decarbonizing global economy, where copper and cobalt are bound to feature prominently. It should take the opportunity to link mining more strongly to the rest of the economy, through domestic financial mobilization and the promotion of downstream value addition and associated beneficiation strategies.

6 Building public sector capacity for managing the mining value chain

6.1 Enhancing the capacity for analyses of mining operations and tax collection

Zambia's mining fiscal policies have in the past often been hastily devised and rarely based on deep analysis and strong capacities for modelling their impact on production and revenues. It is important for the country to revamp its mineral revenue model and achieve a transition towards a multi-sector approach which anchors costs and pricing monitoring and incorporates issues such as transfer pricing and production and financial audits (Readhead 2016). Such an approach would help develop better systems for information and data sharing between key public financial management agencies (notably the ZRA, Ministry of Mines, and the Ministry of Finance). This calls for strategic investment in capacity development across the relevant agencies and departments covering the mining sector, as well as the ZRA (a unit for transfer pricing analysis was created there in 2016, but its strength in dealing with complex issues is inadequate). In addition, the government should, where appropriate, hire specialized advisory agencies to enhance the state's negotiating capacity and achieve the best possible outcome for the country. This is one of the best practices that we observed in the case of Botswana.

In the specific case of the ZRA, its staff should acquire expertise in analysing the critical issues of base erosion and profit shifting, which will require going beyond traditional training methods, including transferring skills to ZRA inspectors to keep them on top of the rapidly changing mineral business environment. The failure to improve capacities for tax administration in these new areas may mean that even the best designed mineral revenue policies might not work (World Bank 2016). The ZRA should address these capacity issues by recruiting fresh degree holders who can be trained in targeted areas of tax administration, especially the complex tax operations of the mining multinationals. Additionally, to better equip the ZRA to deal with the mines and related issues, there is need to set up a specialized crack mining taxation team within the agency, headed by a Commissioner for Mining Taxation and Revenues, and reporting directly to the Commissioner General, to give it teeth. The proposed expansion of ZRA and the other proposals suggested here should be self-financing and need not stress the budget unduly.

6.2 Promoting value addition

Zambia's mining taxation policy needs to actively promote value addition downstream by providing strategic support to local firms. So far, the electric cable production company, Metal Fabricators of Zambia (ZAMEFA), established by the government in 1968, has been the lone example of value addition downstream for copper. ZAMEFA was privatized in 1996 and first listed on the Lusaka Stock Exchange in 2004. Today, its products include electric cables, copper-coated rods, telephone cables, aluminium overhead conductors, and insulated electric wires.[13] Its raw material input are sourced directly from the mines on the Copperbelt where the company is

[13] ZAMEFA (2020).

located, providing a unique example of aggregation economies at the local level. However, ZAMEFA uses under 2 per cent of the copper produced in the country and its production needs to be scaled up substantially to have meaningful impact on the rest of the industrial sector. Cobalt and other metals such as manganese are exported without processing. The reasons why Zambia has not achieved a higher level of copper on-processing are not trivial. As noted earlier the policy environment has not been attractive, with the government's stop-go initiatives discouraging long-term investment in downstream activities.

Second, to increase value addition, a mix of mineral taxes and incentives for investment will be required before the process becomes self-sustaining. For example, the strategic taxing of the export of raw mineral as opposed to exports of processed products could help expand semi-processing and manufacturing outright, especially of copper and cobalt, and those of emerging minerals such as gold and manganese. However, as Addison and Roe (2018) argued, this switch in stance needs a good cost–benefit analysis, otherwise it could well be a drain on public finances. This is because the revenue impacts of these policy shifts take longer to realize than expected and there is an opportunity cost, in terms of potentially reducing expenditures on social sectors. Indeed, ten years ago, Zambia experimented with the so-called 'soil tax' to discourage the export of copper and other metals in raw form, but this was quickly reversed due to resistance and pressure from the private mining firms and fears within the government itself over declines in revenue. This points more broadly to the importance of considering the impact of macroeconomic policies and implied trade-offs on the performance of mining more broadly.

Third, the government should nevertheless encourage innovation in the search for alternative uses of copper in the local industry, with the goal of boosting its role in industrial processing. For example, ZAMEFA and similar companies could be encouraged to diversify beyond cables to manufacturing more advanced products, including electric motors and similar components, for the local and regional markets. Here, the answer lies in whether the government is keen enough on delivering its ambitious diversification agenda and whether it can devise an adequate set of market-based incentives to respond to the emerging needs of the green economy. The emergence of a mass market for EVs represents a promising development opportunity for mineral-abundant countries (as well as investors in minerals and EV manufacturing), although at this stage the prospects for Zambia remain quite speculative, requiring deeper analysis (Jones 2020). Zambia's neighbour to the north, DRC, recently announced during the COP26 climate conference that the country will no longer accept the export of its raw materials, notably cobalt, by commodities giant Glencore: 'They will now have to be processed locally'.[14] Could Zambia be next?

6.3 Looking ahead

It is uncertain whether Zambia, at the present level of technology, and with the scale economies required, could successfully jump onto the EV value chain. Generally, for efficient and on-time delivery of the inputs required, producers of EV components prefer to locate their facilities close to EV manufacturing plants (Jones 2020). For example, EV batteries are sensitive to long distance haulage of products to EV manufacturing locations, making it virtually impossible for Zambia and other countries in sub-Saharan Africa to profitably undertake battery shipments to EV manufacturers in China and/or Europe. A simpler alternative would be to focus on regional value chains, supplying EV components manufactured in Zambia to countries such as South Africa where EV manufacturing capacity is being developed.

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[14] swissinfo.ch (2021)

However, given the widespread optimism for growth in EV sales, and despite the potential risks and challenges associated with EV market entry, many developing countries are staking ambitious claims on EV battery-related investments. Bolivia, for example, has reportedly earmarked up to US$1 billion of public investment for the development of a domestic lithium battery industry (Mariette 2020). Still, the country's hope of enjoying first-mover advantage could well be disrupted by the heavy infrastructure investment needed to get the lithium to market and the latent resource nationalism which in the past inhibited FDI flows to the mining sector and the country more broadly.

7 Main conclusions

This paper suggests several lessons of experience with respect to the challenges of and prospects for creating a sustainable fiscal regime for the mining sector in Zambia.

First, on its own, simply raising taxes has not translated into higher or sustainable revenue for the government. On the other hand, absent a good and credible strategy for improving the mining business environment and better and more transparent relations with the mining companies, keeping mining taxes low will not necessarily translate into a more attractive fiscal regime nor will it increase tax compliance. Therefore, tax policy must be context specific and not applied mechanistically. While the government has been quick to design measures to close the revenue shortfalls, many decisions that were taken in haste then returned to haunt the government. Furthermore, while there is a political tendency to focus on mineral revenue enhancement, it is the continuity in production that is mainly responsible for a stable stream of tax revenue rather than the actual tax rate.

Second, mining companies are in Zambia to maximize profits and will take advantage of tax loopholes in the system to do so. The onus is on the government to see that the mining industry demonstrates a high level of compliance. It is also conceivable that higher tax rates on the mining, a key sector, will have knock-on effects on other parts of the economy, through both spending and supply effects. This invariably hurts job creation, service delivery, and creation of business opportunities. It is thus important that the tax administrator, ZRA, has adequate capacity to collect taxes from the mining companies, which have sophisticated financial reporting schemes and tax expertise of their own. It will also be crucial for ZRA and other government agencies to understand the implications of the various tax changes on the overall tax effort and those of the impending green economy.

Third, while tax rate adjustments in Zambia are elaborate, and largely sensible in design, they have been difficult to administer for lack of capacities for implementation. Hence on average their impacts have been diffuse. The country needs to develop stronger capacities for economic analysis and financial and production audits (as well as negotiations) not only in line ministries (i.e. mining, industry, and trade) but also at the Ministry of Finance.

Fourth, although mining companies are initially attracted to Zambia by sizeable incentives and friendly overtures, the situation changes abruptly when the government and the citizenry perceive that the new investors are beginning to make money. When this is not reflected in rising domestic mineral revenues, abrupt changes in mining taxation are then crafted to deal with the political fallout. These ex-post changes in the incentive packages previously agreed with the mining companies distort their planning horizons without yielding much revenue, hence creating a vicious circle. Moreover, they leave a bad taste that makes it even more difficult to attract new investors.

Fifth, Zambia's reliance on foreign firms for mineral prospecting and development and exports has been a source of domestic tensions and the resurgence of resource nationalism. Further privatization cannot be the solution. Zambia's neighbours such as Botswana resolved this problem by reaching long-term agreements with leading mining firms, while pursuing domestic benefits aggressively. Increasing the share of local ownership of mining assets, including through JVs, could potentially raise mineral revenues (including dividend income) while promoting operational stability in the mines.

Sixth, mining tax policy can be used to strengthen linkages with the rest of the economy, through value addition and the development of local content. Income tax policy could also be used to incentivize local ownership and thereby lessen the political pressures emanating from resource nationalism. This point has been well recognized in Zambia and what is needed is government buy-in to the good ideas already out there.

Seventh, fiscal pressures requiring drastic changes in the mineral code often originate from poor management of mineral revenue, including failure to institute stabilization mechanisms. A functional revenue stabilization fund could help alleviate fiscal pressures, while an offshore sovereign wealth fund could support the country's international reserves. Experience has shown, however, that few countries are able to resist the pressure of using the extra revenue for expanding political patronage. But those that have succeeded have been able to use stabilization funds to reduce their vulnerability to revenue shocks.[15]

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[15] See, for example, the discussion by Solimano and Guajardo (2018) of the calming effect of stabilization funds on fiscal rules for the mining sector in Chile. However, efforts to set up such mechanisms in Ghana, Chad, Lesotho, and, more recently, Uganda have been unsuccessful in the face of fiscal pressures and political expediency.

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