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**Understanding the implications of the boom-
bust cycle of global copper prices for natural
resources, structural change, and industrial
development in Zambia**

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Abstract: This paper is about understanding the cycle of global copper price booms and busts over Zambia's economic history. We explore how the mining industry has been managed, and wider economic management during boom periods. We find that successive Zambian governments did not use copper revenues to accumulate productive assets, focusing instead on financing consumption subsidies and sustaining inefficient state-owned companies. In recent times, Zambia has accumulated worryingly high levels of sovereign debt with virtually no prospect of official debt relief. Nonetheless, a reasonable chance exists of avoiding debt distress, provided the authorities consistently pursue strong fiscal management and discipline. Ultimately, Zambia's ability to ringfence and prudently use the mineral revenues from copper mining in building productive capacities remains elusive. Instead recurrent consumption expenditure demands dominate the fiscal landscape and the agenda of the fiscal authorities.

Keywords: boom, bust, copper prices, economic management, fiscal, mining

JEL classification: Q33

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1 Introduction

Since becoming independent in October 1964, Zambia has experienced a number of resource-based boom-and-bust cycles. Its main industry, copper mining, accounted for more than 90 per cent of exports in the late 1960s (Nash 1997). In 2017, that share was still 73.6 per cent (MOF 2018), indicating little diversification—although, as we discuss later, there has been variation over that period. Mineral exports other than copper exist, notably cobalt, gold, coal, manganese, and semi-precious stones, and in recent years cobalt, which is mined along with copper in several mines, has become increasingly important as global prices have strengthened due to the use of the commodity in electronics.¹ Despite this, mineral exports continue to be dominated by copper. Zambia remains around the world’s seventh-largest copper producer and the second-largest in Africa, having ceded first place to the Democratic Republic of Congo in 2015.

Thus, understanding the boom, or rather the cycle of booms and busts, over Zambia’s economic history is almost entirely about understanding the fortunes and misfortunes of the copper mining industry, its impact on the rest of the economy, and how the industry and the broader economy have been managed during booms.

Much has been written about Zambia’s experience in managing its mining industry and in trying to ensure that this industry benefits the economy of Zambia and its people. Successive development plans, most notably the Fifth, Sixth, Revised Sixth, and Seventh National Development Plans (2006–10, 2011–15, 2013–16, and 2017–21, respectively) have struggled with the issue. In particular, Adam et al. (2014) is a good starting point, offering perhaps the most exhaustive recent analysis of the topic; among their key conclusions was that ‘Zambia is a country endowed with abundant natural resources that can be harnessed to put the country on a sustainable development path. Foreign ownership of mining companies and attractive tax incentives have limited the amount of resources that the economy can absorb from increased mining revenues’, and also that ‘democracies find the conversion of natural resource wealth into sustained prosperity particularly difficult to manage’ (Adam et al. 2014: 14).

This paper sets out to assess the prospects for Zambia’s natural resources, notably its mining industry, and the implications for its revenues, especially for the public sector, focusing particularly on the available evidence on the size of the revenues and the timing of their availability. Then, based on the country’s long and challenging experience of managing the fluctuating fortunes of the industry, it attempts to draw lessons for policy and institutional changes.

2 Zambia’s economic and political context

Zambia’s economic performance can be broken down into three main phases, drawing on the insights and observations of various authors (Adam et al. 2014; Bigsten and Kayizzi-Mugerwa 2000; Chan and Clancy 2000; IMF 2017; Kaunda 2002; Nash 1997; Ndulo and Mudenda 2004).

From independence in 1964 to 1973, the economy grew on average by 6 per cent per annum as mining output and copper prices rose (Nash 1997; Ndulo and Mudenda 2004). In 1970, the mining industry was partially nationalized, as the state took majority ownership of the mines, followed in

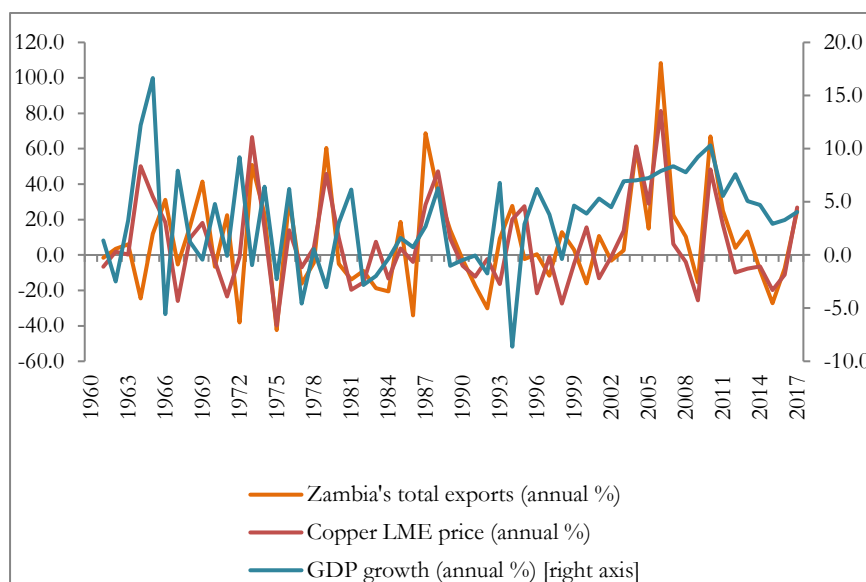
¹ However, cobalt, at 1.3% of exports in 2017, and gold, at 2.2%, remain relatively small.

1973 by full nationalization and the abrogation of management agreements with the former owners. Eventually, ownership of the mines was vested in Zambia Consolidated Copper Mines Ltd (ZCCM), a wholly government-owned corporation. Also in 1973, Zambia became a one-party state following a socialist ideology, a situation reversed in 1991 when a multiparty dispensation was reintroduced (Chan and Clancy 2000).

The Movement for Multi-Party Democracy (MMD), which was elected in that year, espoused a liberal, free-market agenda and started a process of economic liberalization and privatization, culminating in privatization of the mining industry in 2000 (Bigsten and Kayizzi-Mugerwa 2000; Chan and Clancy 2000; Ndulo and Mudenda, 2004). From 1973 to 2000, the economy stagnated and per capita incomes actually fell, due to low copper prices and adverse terms of trade (oil prices having increased dramatically in the 1970s) as well as economic mismanagement. Copper output, which reached 750,000 tons in 1970, fell steadily to only 250,000 tons in 2000.

From 2000 onwards, economic growth recovered, averaging more than 6 per cent until 2009, when the international financial crisis hit and copper prices again dipped significantly. By 2009, copper output had again reached over 700,000 tons, following major investment in the sector by the new owners (Adam et al. 2014; IMF 2017) (see Figure 1).

Figure 1: Growth, export growth, and global copper prices



Note: LME = London Metal Exchange.

Source: Authors' construction based on World Bank (2018) and UNCTAD STAT (2018).

3 Extent of the mineral resource

There are limited data on Zambia's mineral resource. A United States Geological Survey of undiscovered copper resources in Africa estimated that 8.4 million tons of undiscovered copper lies in the Roan arenite tract, which roughly covers Zambia's Copperbelt and Central Provinces (Zientek et al. 2014). However, this does not include the North-Western Province, which in 2017 accounted for 70 per cent of Zambia's production of 797,000 tons, with three of the largest mines, Kansanshi, Lumwana, and Kalumbila. Nor does it include Northern Province, where at least one investor is seeking to start a major mine. Although mineral reserve quantification studies and reports are hard to come by, the *Zambia Business Times* of 26 March 2016 quotes an 'economic

report on Africa’ as recording that Zambia had a copper reserve of some 35 million tons in 2016, equivalent to US\$228 billion at a copper price of \$6,500 per ton (*Zambia Business Times* 2016).

The World Bank (2016) concluded that rules for licence allocations and geological data collection—that is, the *de jure* situation—are the highest-scoring aspects of Zambia’s mining regime. In other words, the basic legal framework for Zambia’s mining industry is reasonably sound. However, the World Bank also found issues relating to the awarding and retention of exploration and mining licences, which it said lacked transparency and consistency. It found weaknesses in three areas:

- Interview responses on allocating and managing licences raised concerns about the use of discretionary power, whether procedures are followed in practice, the application of procedural timeframes, the application of sanctions on non-performing companies, and poor resourcing of the unit managing licence monitoring;
- Keeping the mining cadastre up to date; and
- The state of mapping and geological exploration, which falls short due to a low proportion of licensed ground being serviced by active mapping and due to limited recent geologic mapping, and because the development of geological information, including geological mapping and databases, is not strong.

The same report stated that geological mapping of the country is only 60 per cent complete and that there is no large-scale reconnaissance licence in place. Thus, the full extent of Zambia’s mineral resources is yet to be discovered, fully quantified through exploration, and exploited.

The Fraser Institute, which conducts annual surveys of investment perceptions among mining companies globally, ranked Zambia 6th out of 14 African countries in 2017 for investment attractiveness, and 71st out of 104 globally—compared with 43rd in 2016 (Stedman and Green 2017). Respondents to that survey voiced increased concern over the taxation regime, the geological database, and political instability.

Zambia scored 50 out of 100 points in the Natural Resource Governance Institute’s resource governance index for 2017 (NRGI 2017), with an above-average score for value realization (58/100) and the enabling environment, but below average for revenue management (35/100). The index was especially positive about ZCCM-IH,² which it rated the second-best-governed state-owned enterprise in sub-Saharan Africa. However, the pipeline of new investment in mining is limited. Recent investments have included the Kalumbila mine, output from which is already scaling up significantly, the Synclinorium investment by Mopani mine in Kitwe, and the new smelter at Kansanshi in Solwezi. Given the gestation period for new investment, it is possible that mining output could reach a plateau in the next few years. In addition, mining output and new investment have been constrained in the recent past by power shortages. Mining consumes about 55 per cent of Zambia’s power generation.

Zambia has taken steps recently to address its power deficit, most notably by eliminating power subsidies and thus making power investment more attractive. This was despite resistance from the mining industry, which was the major beneficiary from the power subsidies. The current investment pipeline includes a 700 MW investment at Kafue Lower, some 600 MW of solar installations, and 350 MW from the Maamba coal-fired facility. Finance is being sought, by both

² Zambia Consolidated Copper Mines-Investment Holdings (ZCCM-IH) was established in 2001 as the holding company for the minority shareholding that the Zambian government retained after privatization. Its shareholding ranges from 10% to 50% in ten mining companies.

public and private operators, through public–private partnerships (PPPs), for major investments at Batoka and on the Luapula River. There is reason, therefore, to be cautiously optimistic about the country’s ability to meet its power requirements. The Commonwealth Development Corporation (CDC) is also taking a controlling interest in the country’s largest independent power producer, the Copperbelt Energy Corporation, with a view to expanding its access to private finance.

As a result, the Seventh National Development Plan (7NDP) is cautious about projecting Zambia’s future copper output, with a target of 1 million tons by the end of the plan period, compared with 797,266 tons in 2017 (Republic of Zambia 2017) based on current investment plans. At the same time, the 7NDP sets out strategies to address these issues, notably through better geological information generation and provision; improved mineral processing; development of market linkages; and promotion of mineral exploration. Petroleum exploration is being promoted, and a number of oil blocks are being explored, but it is too early to estimate any yield from these efforts.

A new mining policy is reported to be under preparation, but no details are currently available.

Current price projections by the World Bank (2015a), the Fraser Institute (Stedman and Green 2017), and others indicate that prices for copper are likely to remain in the US\$6,000–7,000 range and that cobalt prices are also likely to remain high. Such projections are of course subject to great uncertainty, depending on an expanding world economy, especially with the growth of China, strong investment and construction demand, and the growth of the electric car industry. Recent actions on world trade by the US government could well lead to lower growth in world trade and the global economy. But even without such considerations, the track record of commodity price forecasts has been mixed—inevitably so.

4 How large are the resource revenues likely to be?

From 2013 to 2025, one estimate is that 5 per cent to 7 per cent of GDP can be raised from mining companies (Simpasa et al. 2013). This compares with 5 per cent of GDP (28 per cent of government revenue) in 2014. This estimate includes not only mineral royalty and company income tax, but VAT on imports, income tax (PAYE) on wages and salaries paid by the mining companies, and other payments. The key assumptions behind the lower figure are that the mining tax regime remains unchanged from 2013 and that unit costs for the industry increase at the same rate as they did from 2008 to 2012. Output and exports are assumed to remain at 2012 levels. This could therefore be considered a conservative estimate, given that both output and prices are now higher than at that time, and that output is likely to increase based on projects that have started since then or are in the pipeline. In US dollar terms, public revenues would remain at slightly over \$1 billion per annum. Similarly, a World Bank projection in 2015—based on the mining tax regime in place then (subsequently revised)—projected public revenues at \$1.5 billion by 2020, tapering off to \$1.2 billion by 2013 (World Bank 2015b). However, a much more optimistic scenario from the same United Nations Development Programme (UNDP) source has revenues reaching \$4 billion per annum, based on the expiration of capital allowances, significantly higher levels of production and exports, and higher prices.

The conclusion is that the range of possible public revenue outcomes is large and uncertain. Notably, the lower range of possible revenue projections does not show a significant increase in public revenues from mining, indicating that there may, in fact, be no boom.

5 When are the revenues likely to come on line?

The future trajectory of mining revenues will depend on the extent of the resource (discussed above) and new investment. New investment in turn will depend in part on a range of government policies in the mining sector, notably support for exploration, licensing, and taxation.

As noted earlier, mining already accounts for a significant share of exports (75 per cent in 2015), government revenue (26 per cent), and GDP (10 per cent) (ZEITI 2015). In addition, mining investment over the period 2004–16 totalled US\$12.3 billion, about 70 per cent of the total foreign direct investment (FDI) stock in Zambia (BOZ 2017). It accounts for about 21 per cent of formal sector employment (World Bank 2015b).

As noted above, copper output had fallen from a peak of 700,000 tons in 1970 to 250,000 tons in 2000, partly because of low copper prices but also because of limited investment and high operating costs, leading to the mines losing some US\$20 million per month by the late 1990s. Under pressure from international donors, but also recognizing concerns about the performance of the mines, the mines were privatized, with the government holding a residual golden share of about 10 per cent on average in the privatized companies through ZCCM-IH.

The privatization process has been criticized and remains controversial. In particular, the Development Agreements (DAs) between the government and the new owners (which have never been officially published, but have been leaked) locked in taxation and other provisions for 15 to 20 years (depending on the particular DA³) in a way that prevented the Zambian government from benefiting from any price or profit windfall (Lombe and Mwakacheya 2017; Manley 2017). Specifically, mineral royalty was set at 0.6 per cent of gross sales value, less the cost of transporting, insuring, and processing/refining the products; company income tax (CIT) was set at 25 per cent of gross profits, less depreciation, price participation payments to ZCCM-IH, capital expenditure incurred during the year (100 per cent depreciation), and accumulated losses carried forward (Lombe and Mwakacheya 2017; Manley 2017). The DAs also included provisions for subsidized electricity—a significant distortion as the mines came to consume more than 50 per cent of Zambia’s power output. As noted earlier, privatization contributed to a substantial increase in mining investment and consequently output, though the increase in copper prices during that period means that attribution is not straightforward. In general, for many commentators, the mines’ privatization was seen as ‘selling the family silver’ (Kaunda 2002). Certainly, the sale of the mines coincided with the low point in the copper price cycle, with the probable result that the mines were sold for less than they would have been, had it been possible to wait for better conditions.

Despite the Agreements, in 2008 the government introduced both a windfall and a variable profits tax, which—after protests from the mining companies—were eventually withdrawn (Adam et al. 2014). At the same time, the DAs were abrogated. In addition, the depreciation allowance was reduced from 100 to 25 per cent; the loss carry-forward was reduced to a maximum of ten years; hedging operations were to be taxed separately; and the mineral royalty was raised to 3 per cent and applied to gross sales (Manley 2017). An IMF assessment suggested that the result of these changes was to increase the average effective rate on mining in Zambia from around 31 per cent to 47 per cent (Adam et al. 2014), taking Zambia from being one of the lowest to one of the highest tax regimes among developing countries.

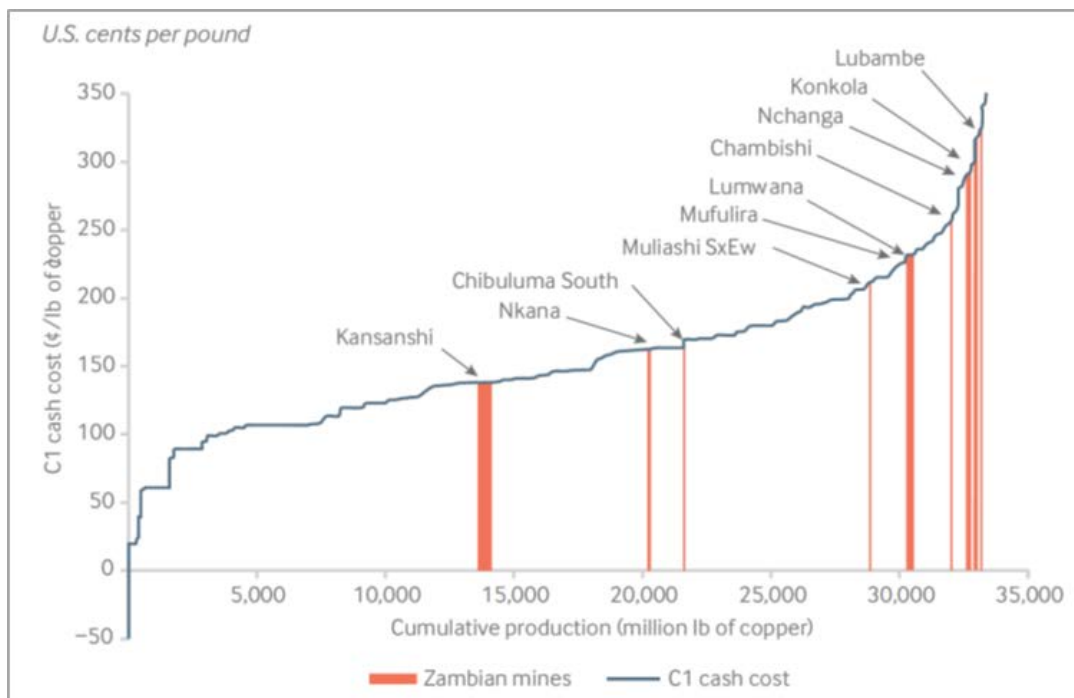
³ It should be noted that the DAs were not standard, and that different provisions applied to each mining company.

Following criticism from the mining companies, the tax regime was again changed in 2009. The windfall tax was withdrawn and the 100 per cent capital allowance was restored, but the royalty was increased to 6 per cent in the 2012 budget, sufficient—according to IMF estimates—to generate an additional 1.5 per cent of GDP (Adam et al. 2014). However, in the 2015 budget the mineral royalty rate was changed to 20 per cent for open-pit mines and 8 per cent for underground mines, while corporate income and profits taxes were set at zero. After only a few months, in July 2015, corporate income and profits taxes were reintroduced and set at 30 per cent, while the mineral royalty was set at 9 per cent for all mines.

In 2016, the mining tax regime was changed again, partly in response to pressure from the mining companies. The main change was the removal of the 9 per cent royalty and its replacement with a price-based royalty, similar to the windfall tax but at lower rates: 4 per cent when the LME price is below US\$4,500 per ton, 5 per cent when it is between \$4,500 and \$6,000, and 6 per cent when the royalty is above \$6,000. With prices currently in the \$6,000–7,000 range, this is significantly lower than the previous regime. In addition, the variable profits tax was removed (Manley 2017).

Manley also estimates that the effect of the new tax regime will be to reduce the effective tax rate for low-cost mines from about 58 per cent to about 43 per cent, and for high-cost mines from about 90 per cent to about 68 per cent. Most mines in Zambia, especially the underground mines, are relatively high-cost, as shown in Figure 2. However, an increasing share of mining output is coming from lower-cost mines, mainly open-pit, in the North-Western Province.

Figure 2: Zambian copper mines' cash operating costs in 2013, US\$ per pound of copper sold within the global cost curve



Source: Manley (2017: 8), reproduced with permission.

Related to this, Manley argues that the new tax regime is less progressive with respect to price, and therefore less able to capture the rents generated by the mines. Since the royalty is applied to output, not profits, it does not capture rents directly. But it is a reasonable assumption that profits rise as prices rise, so that relating the royalty to price increases is an approximation to rent increases, though probably not to total rents. Manley goes on to argue that the Zambian government will face pressure to increase taxes again if prices remain high. At the same time, if prices are lower in

the future, a less progressive regime risks the closure of high-cost mines, with consequent impact on employment, especially in the politically sensitive Copperbelt.

Ideally, the tax regime would capture rents through profit taxes, which take account of costs. But mining costs are notoriously hard for the tax authorities to verify, and are widely suspected of being inflated specifically to avoid taxation. While there are challenges in verifying output and sales too, these are somewhat less difficult than those on the cost side and may be easier for the tax authorities to overcome. In general, lack of quality data on mining companies in Zambia has fuelled perceptions of large-scale tax evasion (World Bank 2016). Efforts to improve data quality and availability are proceeding. The Zambia Extractives Industries Transparency Initiative (ZEITI) has produced authoritative data up to 2015, but nothing more recent.

In addition, the government is, with support from co-operating partners, implementing two projects aimed at addressing the data issue. The Mineral Value Chain Monitoring Project (MVCMP, www.mvc.org.zm), which is based at the Zambia Revenue Authority (ZRA), monitors the mineral value chain from exploration to export, one of its aims being to improve tax collection. In addition, it is establishing the Mineral Output Statistical Evaluation System (MOSES), which will produce comprehensive audited data on mining production and exports. Secondly, the Mineral Production Monitoring Support Project (MPMSP), based at the Ministry of Mines and Mineral Development (MMMD), also aims to support tax collection through effective regulation and monitoring of mineral production, particularly through capacity development at the MMMD. It aims to improve the issuance of mineral export permits and the analysis of mineral content through spot tests. Since early 2016, new monthly reporting systems for mineral production are being used to compare mines' production reports with their export permits and royalty reporting.

For obvious reasons, the extent of tax evasion and avoidance is hard to estimate and is the subject of controversy. The report of the High Level Panel on Illicit Financial Flows (IFFs) from Africa—also called the Mbeki Report—stated that Zambia loses around 9 per cent of its GDP to IFFs (AU/ECA Conference of Ministers 2014: 55). The UNCTAD (2016) study *Trade Misinvoicing in Primary Commodities in Developing Countries* found that over the period 1995–2014, 67.7 per cent of Zambia's copper exports went to China and Switzerland, both countries with high levels of export misinvoicing. In the case of Switzerland, no such exports are recorded by the recipient country, probably because the exports are effectively in transit to another destination (Readhead 2016). UNCTAD (2016: 16) found copper under-invoicing of US\$5.6 billion, equal to 10 per cent of Zambia's copper exports over the period. Global Financial Integrity, the Washington-based think tank, at one point stated that Zambia lost \$8.8 billion in IFFs between 2001 and 2010 (Kar and Freitas 2012) and that the country was losing \$2–3 billion per year to the mining industry, but then modified the claim, maintaining that the problem clearly exists but withdrawing the specific estimate (Forstater 2017a, b). Against this, the World Bank (2016) found that Zambia scored relatively well on tax policies and instruments, including rules for auditing, base erosion, and profit shifting.

The existence and extent of tax evasion and avoidance and IFFs related to the mining sector are inevitably the subject of political debate and pressure. For example, in March 2018 the ZRA announced that it had uncovered tax irregularities by a prominent mining company of ZMK76.5 billion (about \$7.6 billion) resulting from the misclassification of consumables and spare parts at importation for the previous five years; the company subsequently identified itself as Kalumbila mine, owned by First Quantum Minerals, Zambia's largest mining company and largest tax-payer. Similarly, a dispute is ongoing between ZCCM-IH and First Quantum over the application of profits from Zambian mines to development expenditures at a South American mine. Such disputes are almost inevitable and no judgement as to their validity can be made here.

However, they can increase the perceived risks of new investment if they are not handled within a rules-based framework which reflects consultation.

Lombe and Mwakacheya (2017) conducted interviews with mining companies and other stakeholders (unions, community sector organisations) to establish perceptions about the way government has handled the industry. In addition to concerns about policy consistency, they record a lack of consultation; a preference by government for operating through statutory instruments rather than legislation; a lack of appropriate analysis and impact assessments; the politicization of decision-making; and insufficient attention to revenue-sharing among central government, local government, and communities.

While such agencies as the World Bank and the IMF, not to speak of the mining industry itself, argue for a stable and predictable tax regime, the relatively short-term time horizon for politicians in Zambia means that that regime—and indeed other aspects of mining policy—are at constant risk of change due to new developments, as well as new analysis. As Manley states:

The government faces two trade-offs when designing the tax regime. One is the desire for a progressive regime that captures rent and increases the overall stability of tax policy against the disinclination to expose the treasury to the risk of low mining revenue if prices fall. The other is the desire for a progressive tax regime on the one hand, and a regime that is simple enough to collect revenues and combat tax avoidance on the other. (Manley 2017: 17)

The political trade-offs around the tax regime are complicated further by the impact the mining industry has on employment, social development, and the environment. Despite employing some 90,000 workers directly (about 8 per cent of formal employment; World Bank 2016), the numbers in indirect employment, especially in mining areas, are much larger. Likewise, despite the small share (approximately US\$2 billion annually: some 10 per cent) of goods and services consumed by the industry that are produced locally, many contractors to the mines use local labour and are subject to the fortunes of the mining industry. As noted earlier, this poses a particular challenge for the higher-cost operations in the Copperbelt, where some of the older mines are approaching the end of their lives. Recent experience in the absorption of job losses in the Copperbelt suggests, however, that these challenges can be managed through a combination of co-operation with the trades unions, retraining, and small business support.

Before privatization, ZCCM, as the state-owned mining company, provided a wide range of social services, (hospitals, schools, local infrastructure) in most if not all mining areas. With privatization, these responsibilities went to local authorities, which were ill equipped, both financially and organizationally, to carry them out to the standard to which they had been delivered under ZCCM. As stated in the MinGov report, ‘a key shortcoming is the absence of a legislated requirement for sharing resource revenue between central and local governments’ (World Bank 2016a). The ICMM (2014) found that ‘in 2012, the four mining companies (Mopani, KCM, Lumwana and First Quantum) spent just under \$70 million on social investments’, equivalent to 0.3 per cent of Zambia’s GDP. In the Copperbelt, the companies have continued to run hospitals, health clinics, and some schools—in addition to training facilities aimed specifically at the development of mine-related skills. In the ‘New Copperbelt’, North-Western Province, where community expectations of services were lower, much attention has been paid to basic infrastructure and community services. At Kalumbila, a new township has been developed by the mining company. ICMM (2014) concluded that consultation and engagement around the services being provided by the mining companies was to be recommended; that a holistic approach to providing community services had been quite successful; and that alignment and partnership with local government and non-governmental organizations (NGOs) had been quite effective.

The long history of mining in Zambia has left a legacy of environmental damage in mining towns (World Bank 2016). At privatization, the responsibility for addressing this legacy was left with the government and with local authorities, which were and are ill equipped to handle it, both financially and technically. Kabwe, for example, still has levels of lead pollution as high as or higher than those of any other municipality in the world. Tailings dumps accumulated over decades of mining have not been cleaned up, since their owners (and many informal miners) believe that increased copper prices will at some point make recovery profitable. Meanwhile, the dumps are causing environmental health liabilities in local communities. In addition, copper smelters in several Copperbelt municipalities have been responsible for sulphur dioxide (SO₂) emissions, potentially causing acid rain, soil erosion, crop damage, and air and water pollution. The Kafue River has been affected, which has given rise to some international activism by environmental NGOs. In addition, new (post-privatization) environmental liabilities are often inseparably mixed with the old ones, so that the responsibility for clean-up is unclear.

In addition, some mining companies are not complying with existing regulations, specifically the requirements of the Environmental Protection Fund (EPF). In particular, the prospect that some of the old tailings could be processed at some point in the future (and the fact that some of them are being processed now by illegal small-scale miners who have some political influence) means that there is resistance to remediation. These liabilities may eventually become the responsibility of the state.

The government has attempted to address some of the environmental health risks. It succeeded in directly addressing some of the major risks, notably several tailings dumps, with some demonstrated impact on local exposure levels; and in achieving some policy and legislative progress, notably the Environmental Management Act of 2011 and operationalization of the EPF. However, as noted above, much of the legacy of pollution remains; the responsibility for addressing new environmental issues is ambiguous; and the institutional mechanisms for addressing these issues still require strengthening.

6 Fiscal policy and managing copper booms

In Adam et al. (2014), Paul Collier argues that three rules need to be instituted to govern depleting (or exhaustible) resources, apart from managing volatility. These are: a *savings rule*, which governs the share of resource revenues that should be set aside to offset the depletion of the resource; a process for *managing investment of the savings*; and a *debt strategy* which governs recourse to borrowing.

The savings rule can refer to both domestic private and public saving, i.e. assuming private saving is retained in the country and therefore available for local investment. While there is reinvestment of profits (savings) by the mining companies—in addition to new inflows from outside Zambia—there is to date no private Zambian-owned company in copper mining (though there are several small mines and some presence in the gemstone sector). Thus, savings in Zambia from the mining sector mainly take the form of public saving, which is essentially about taxation, and any dividend that might accrue to the government as result of its holdings in the mines through ZCCM-IH. On the public sector side, Zambia has not created a specific sovereign wealth fund for managing the natural resource revenues from copper mining. This long-term fiscal policy management stance is markedly different to that of, say, Zambia's neighbour to the south-west, Botswana. Like Zambia, Botswana is landlocked, and like Zambia, it is mineral-resource-rich, though mainly in diamonds. In 1994, the Pula Fund was established under the Bank of Botswana Act, as a sovereign wealth fund to hold a long-term investment and form part of the country's foreign exchange reserves. The Pula Fund's goal is to preserve a portion of the income from diamond exports for future

generations. Dixon (2016) reports that the Pula Fund is Africa's oldest and third-largest fund, and that it stood at US\$5.4 billion in 2016. Collier (Adam et al. 2014) notes that a savings rule such as the establishment and operationalization of a sovereign fund should take account of the time that complete depletion of the resource is expected to take: the closer it is to depletion, the higher the savings rate should be.

To date, Zambia has no mineral savings rule in place. Moreover, there is not—and never has been—any mechanism in place to address price volatility, for example through a stabilization fund. Without any savings rules, there is no systematic process for managing investment of the savings. Even successive development plans and annual budgets, while making implicit and, generally, conservative assumptions about likely mineral price trends, have not explicitly set out different possible revenue scenarios against which to plan different expenditure scenarios. While there is widespread recognition among policymakers that revenues can be, and generally are, volatile, the general sense is that little if anything can be done about the volatility itself. The main policy response is to emphasize economic diversification away from mining, a theme which appears in all plans and policy statements and is nominally given high priority. However, diversification has had limited success in practice.

Collier also advises using debt strategies as a fiscal policy anchor for managing resource revenues (Adam et al. 2014). Zambia published its first Medium-Term Debt Strategy (MTDS) in mid-2017 through the efforts of the country's Ministry of Finance (MOF 2017b). Between 2005/06, when the country secured debt forgiveness under the Heavily Indebted Poor Countries (HIPC) initiative and the Multilateral Debt Relief Initiative (MDRI), and around 2012, when renewed rapid debt accumulation began, Zambia had no need of a debt strategy. But with the mounting debt, which reached 58 per cent of GDP by 2016 (as we show in Section 7 below), Zambia needed a debt management strategy; hence the MTDS. However, the MTDS does not make any association between domestic resource mobilization strategies and copper mineral resource revenues or even global copper prices. If the strategy takes into account these important factors, it only does so covertly or implicitly. Thus, Zambia does not have an explicit resource revenue management strategy from a fiscal policy perspective.

7 How much spending? Fiscal projections

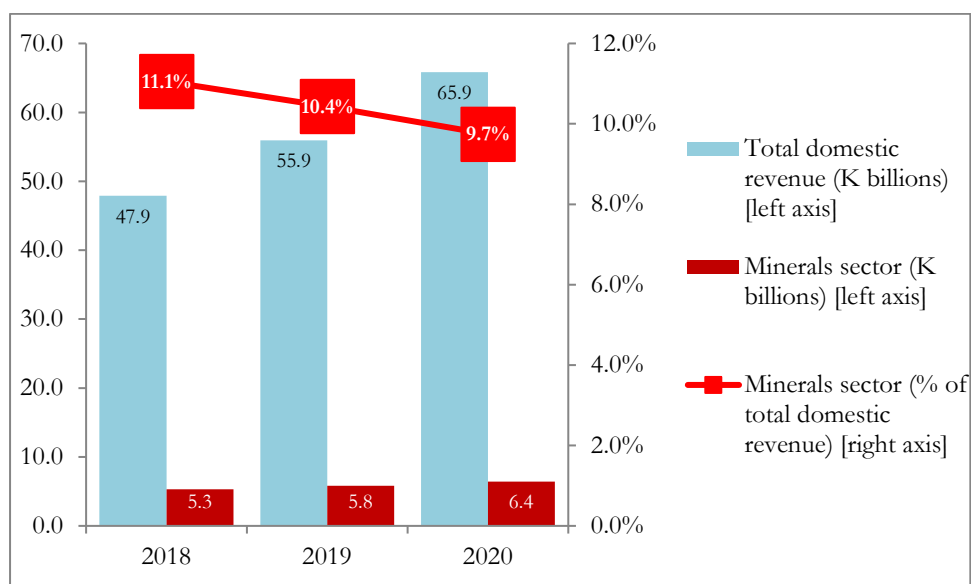
As noted earlier, the 7NDP sets a target for domestic revenue (including mining) at 18 per cent of GDP, which is in turn targeted to reach a growth rate of 5.5 per cent per annum by 2021. It also aims at keeping the fiscal deficit at 3 per cent of GDP, so that public spending does not exceed 21 per cent of GDP (Republic of Zambia 2017). However, the fiscal deficit in 2017 was 7.8 per cent of GDP, against a target of 7.0 per cent, suggesting that significantly more fiscal adjustment will be needed to come into line with the plan. In addition, GDP growth was 4.1 per cent in 2017, and is projected by the World Bank at 4.3 per cent in 2018 and 4.7 per cent in 2019—below the 7NDP targets for those years (4.6 per cent and 5.2 per cent, respectively) (World Bank 2017).

The composition of public spending also gives rise to scepticism that there will be any unencumbered windfall from the mineral resource in the near term. Personal emoluments absorbed some 42.5 per cent of current expenditure in 2017, while interest payments absorbed another 24.5 per cent (MOF 2018).

As one would expect, the fiscal projections on anticipated mineral revenue contributions to the overall fiscal position are hard to pin down. The 7NDP sets out targets, as reported earlier, but does not disaggregate mineral revenue. Over the medium term (2018–20), the Medium-Term

Expenditure Framework (MTEF) projects that total domestic revenue will increase from ZMK47.9 billion in 2018 to ZMK65.9 billion in 2020 (MOF 2017a). The total mineral sector contribution (mining corporate income tax plus mineral royalties, excluding PAYE and import VAT) will increase from ZMK5.3 billion in 2018 to ZMK6.4 billion in 2020, while its share in total domestic revenue is projected to decline from 11.1 per cent of total revenue in 2018 to 9.7 per cent in 2020 (see Figure 3). The declining share reflects an intention by the authorities to slightly reduce fiscal dependency on the mines over time in the medium term. However, these projections predate the large increase in debt and debt servicing since 2017 (see below), which might be expected to increase pressure to tax the mines more heavily.

Figure 3: Revenue forecasts in the MTEF



Source: Authors' construction based on MOF (2017a).

8 Revenue-sharing arrangements

As argued earlier, Zambia's current mineral tax regime is broadly in line with good international practice and is capturing in the region of 40–70 per cent of pre-tax profits, depending on the cost structure of the mines. In addition, since ZCCM-IH holds between 10 and 20 per cent of the shares in the operating mines, except Lumwana, it can be claimed that there is additional benefit to the Zambian state, although this has typically taken the form of increases in asset values, since dividends have to date rarely been declared. However, these calculations do not take account of possible profit shifting, transfer pricing, etc., which are denied by the mining companies.

Leaving possible tax avoidance aside for the time being, the main issue with the current tax regime is its possible lack of progressivity if mineral prices increase. The presence of ZCCM-IH offers the potential for the Zambian state to influence the operating and investment policies of individual mines, though there are limits arising from ZCCM-IH's minority shareholder status. As noted in the MinGov report, co-ordination among the various government agencies involved in the mining sector, (the Ministries of Mines and Mining Development, Finance, and National Development Planning, and ZRA) could be improved (World Bank 2016a).

It is generally argued that the tax regime should be stable and predictable. Certainly, investors will be sensitive to the 'prisoner's dilemma' whereby—once they have committed resources for

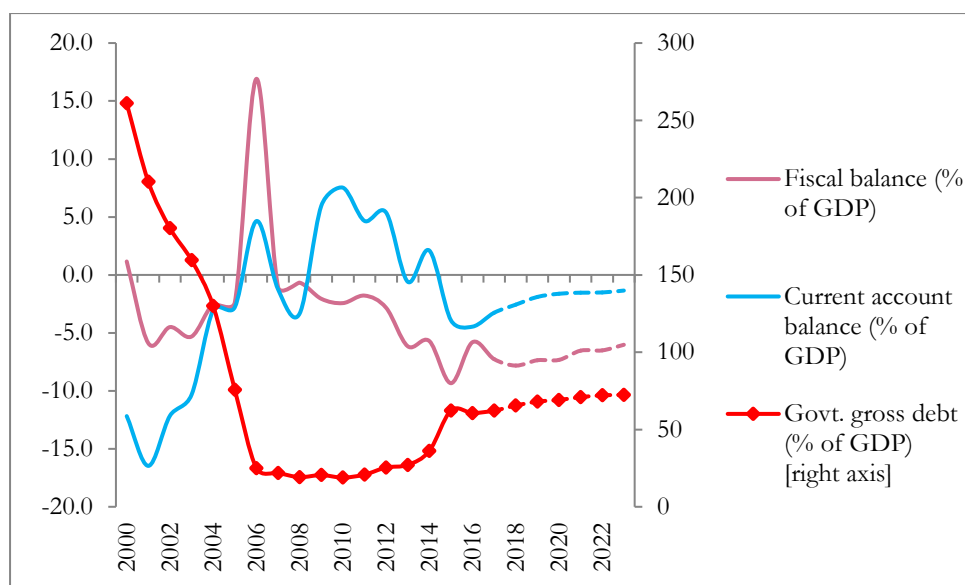
investment and are locked in—they are vulnerable to various perceived assaults on their capacity to earn returns. However, it may be difficult for Zambia to maintain the present tax and royalty regime, especially if copper prices remain high, since there could then be a strong case for raising the royalty rate. In addition, as noted above, Zambia’s debt situation and the need to raise resources for debt servicing will increase the pressure to recover more resources from the mining industry.

As noted earlier, Zambia is taking some steps to address tax avoidance through the MVCMP and the MPMSP, but these initiatives are in their early stages and focus mainly on the revenue side. Possible trade misinvoicing and transfer pricing aimed at under-reporting profits—while receiving some attention, as Readhead (2016) notes—may still require more.

9 Reducing sovereign debt

Zambia’s public debt declined rapidly after the country qualified for debt relief under the Enhanced Initiative of the HIPC and MDRI, falling from 261 per cent of GDP in 2000 to 25 per cent only six years later in 2006 (Figure 4). Fiscal and current account balances jumped to one-off highs in 2006 before normalizing. Current account balances saw a short-lived episode of positive annual outcomes from 2009 to 2012. Fiscal balances remained in deficit throughout, becoming deeper from 2014 onward. This reflected a rapid accumulation of debt, as the public debt stock rose from 36 per cent of GDP in 2014 to 62 per cent in 2015. The IMF (2017) estimated Zambia’s debt stock at 56 per cent of GDP in 2017, very close to the 58 per cent of GDP debt stock estimate announced by the Ministry of Finance at an Economics Association of Zambia (EAZ) event about ten months later in August 2018. The IMF’s prediction was that the debt will reach about 72 per cent of GDP by 2023 (IMF 2018), accompanied by twin (fiscal and current account) deficits. The IMF maintained its assessment of Zambia as being at high risk of debt distress, sustaining the opinion of a joint IMF-World Bank Debt Sustainability Analysis (IMF 2017).

Figure 4: Fiscal and external balances and public debt



Source: Authors’ construction based on IMF (2018).

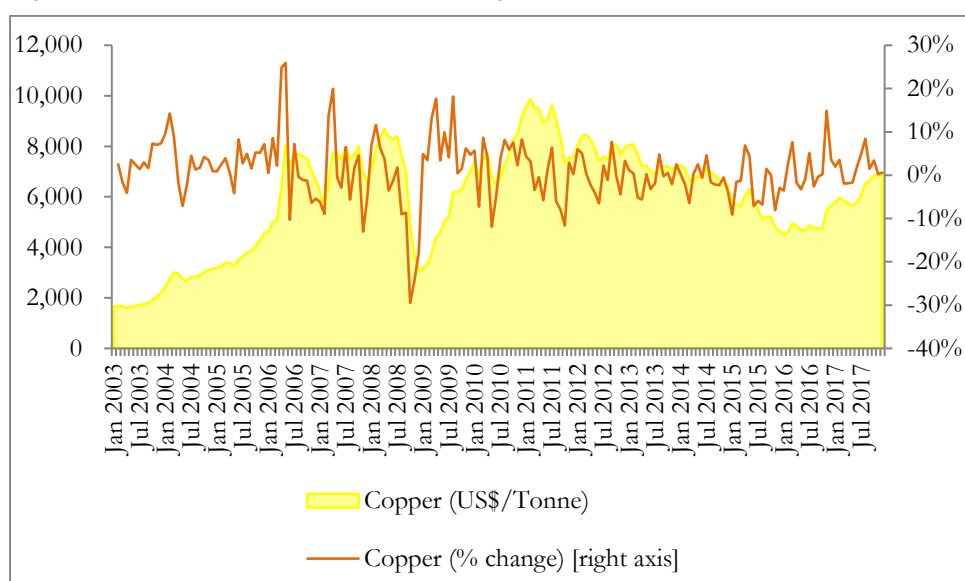
However, with a reducing revenue percentage contribution from mining, no big bonanzas can be expected from the sector in terms of large revenue inflows for debt amortization, even in scenarios where global commodity (mineral) prices rebound further. Mining proceeds are more likely to be

pooled with other revenues towards honouring constitutional obligations (the inflated public wage bill) and statutory obligations (interest payments on debt and arrears payments).

10 Exchange rate

Zambia’s dependence on traditional (mainly copper) exports and therefore on global mineral commodity prices, particularly copper prices, places the country at risk of ‘Dutch disease’—negative impacts on the economy through possible sharp rises in inflows of foreign currency associated with copper which make the country’s other products less price-competitive on the export market—when global prices improve. For instance, global copper prices rebounded, increasing by 21.3 per cent and 20.6 per cent per annum respectively, in 2016 and 2017, after a dramatic 29.9 per cent fall in 2015 (see Figure 5).

Figure 5: Global copper price levels and changes



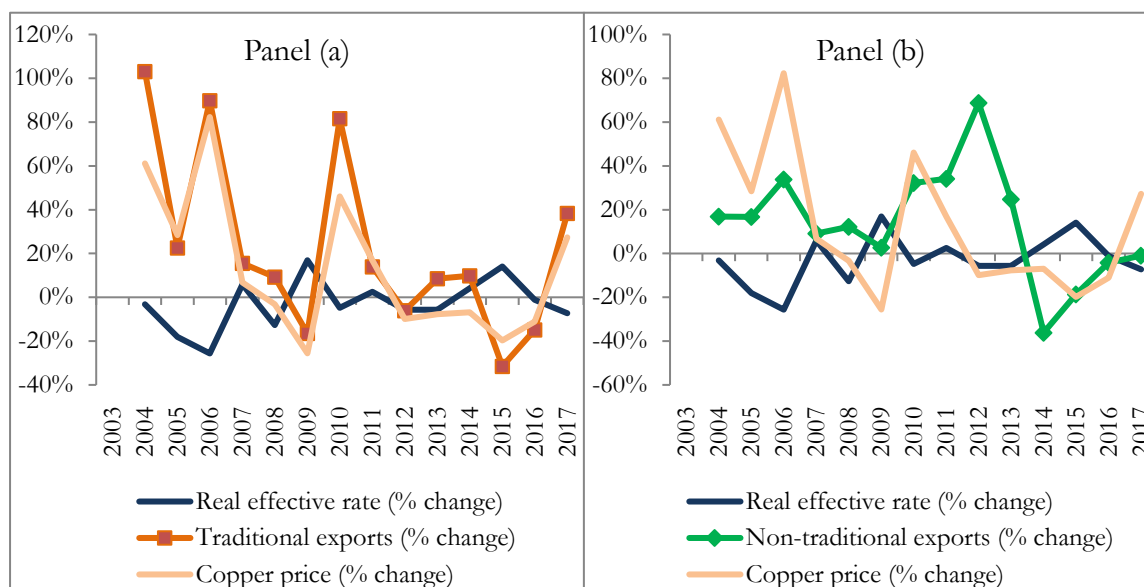
Source: Authors’ construction based on BOZ (2018).

The dependence of Zambia’s traditional export earnings on global mineral commodity price movements—copper prices in particular—is quite evident in the statistics. For instance, the annual percentage changes in traditional exports were directly correlated with annual changes in global copper prices over the period 2003–17 (Figure 6, Panel (a)). However, the relationship between traditional export changes and the real effective exchange rate is less obvious.

One way of testing the competitiveness of non-traditional exports is to check whether the local currency is overvalued. The IMF (2017) conducted a real exchange rate assessment for Zambia. The assessment suggests that a large depreciation brought the real effective exchange rate closer to equilibrium in 2016. The results are based on the External Balance Assessment (EBA-lite)

methodology,⁴ which included three approaches, namely: (i) the current account model (CA); (ii) the real exchange rate model (REER); and (iii) the external sustainability (ES) approach.

Figure 6: Real effective change rate, copper prices and exports



Source: Authors' construction based on BOZ (2018).

Table 1 presents the three sets of results. In summary, the IMF finds the following:

- The CA approach suggests that the real effective exchange rate is about 5.6 per cent overvalued;
- The REER approach suggests that the real effective exchange rate is in line with fundamentals; and
- The ES method indicates an overvaluation of between 4.2 per cent and 10 per cent.

These results show that the local currency was somewhat overvalued although they are inconclusive about the magnitude of the overvaluation. This means the improvement in global copper prices and the resultant increase in copper fortunes has had a small negative effect on the competitiveness of Zambia's non-traditional exports—*prima facie* evidence for mild Dutch disease.

⁴ The EBA-Lite methodology is an IMF innovation for comprehensively assessing an economy's external sector position, going beyond the conventional exchange rate and (balance of payments) current account components to include the assessment of external balance sheets, capital flows, and reserve adequacy.

Table 1: IMF assessment of Zambia's real effective rate gap

	(Percent of GDP)				REER GAP ¹
	Norm	actual	Gap	Elasticity	
1. Current Account Model	-4.3	-5.5	-1.3	-0.23	5.6%
2. Real Effective Exchange Rate Model					-1%
3. External sustainability (ES) approach ²					
Scenario 1: Stabilizing net IIP at 2.2% of GDP ³	1.4	2.3	0.9		4.2%
Scenario 2: Stabilizing net IIP at -15% of GDP ⁴	0.0	2.3	2.3		10.5%

¹ A positive number indicates overvaluation
² The projected current account balance is 2.3 percent for 2022.
³ This is the IIP value at end-2016.
⁴ This is the 5-year average IIP value up to 2014.

Notes: *A positive number indicates overvaluation; **the projected current account balance is 2.3% for 2022; ***this is the IIP value at end 2016; ****this is the five-year average IIP value up to 2014.

Source: IMF (2017), reproduced with permission.

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11 Fiscal rules

Fiscal rules are long-lasting, legally binding, quantitative limits or restrictions on budgetary aggregates. They are numerical bounds on budget aggregates like revenues, expenditures, public debt, and the budget balance. They restrain both the executive and the legislature from amassing excessive powers and discretion in budget-setting and execution (Lienert and Fainboim 2010; Schaechter et al. 2012). Fiscal rules are generally established through legislation, or, in some cases, as constitutional provisions, thus lasting beyond a single fiscal year. They often last beyond the term of office of a single government (Schaechter et al. 2012). This promotes continuity and consistency in policymaking and execution. Proponents of fiscal rules favour them because they offer an avenue for recourse to legal sanctions in cases where political commitment and institutional capacities are weak.

However, opponents of fiscal rules argue that, at best, such rules could be taken as but one component of a wide fiscal framework or budget system laws (clear rules for formulating, executing, and reporting on the annual budget, as well as a clear statement of medium-term fiscal policy objectives). Many observers argue that the ultimate success of a fiscal framework will depend on the political commitment to implement it. Baunsgaard et al. (2012), for instance, emphasize that the issue of political commitment is not trivial, citing an extensive literature on the political economy of resource-rich countries which demonstrates its importance. And fiscal rules might actually compromise the prospects of success of the fiscal framework, particularly if policymakers realize that they can get away with flouting the rules without any sanctions.

The question we are therefore left with is: are economies that are prone to fiscal slippages better off or worse off with fiscal rules? Again, this issue requires a more systematic literature review and further study in order to determine the usefulness and reliability of fiscal rules for a country like Zambia.

12 Public investment

Rajaram et al. (2014) and the Public Expenditure and Financial Accountability Report (PEFA) (GRZ 2017) set out three broad areas for assessing public investment management:

- Planning (including preliminary screening of projects for consistency with national strategies and objectives);
- Allocation (including detailed project appraisal, project selection, and budgeting, i.e. linkage to the budget cycle); and
- Implementation (including protection of investment, funding availability, project management, and evaluation).

The most recent assessment of public investment management in Zambia is contained in the PEFA 2017 report, which paints a dismal picture. It reports that there is currently no public investment management system in place (GRZ 2017: 36). A Public Investment Planning Department has been established in the Ministry of National Development and Planning, but without supporting legislation⁵ it is handicapped and lacks capacity. However, it is in the process of developing a comprehensive planning and budgeting framework (GRZ 2017: 37); and the 2018 budget proposal contained a commitment to strengthening the public investment management (PIM) system. Economic analyses of project proposals and major investments are not conducted or reviewed other than by the sponsoring entity (i.e. a ministry or parastatal agency), or as required by an outside financing entity such as a donor agency. No formal system is in place for project identification, screening, or appraisal. While provision for investment projects is made in the current-year budget, multi-year provision and protection of funding is not taken seriously. No standard procedures are in place for project monitoring, though progress reports are available selectively. As indicated earlier, mining revenues are not separated out from other public revenue sources, so there is no separate budget for such investments. In general, maintenance of public assets is underfunded, despite some efforts, for example through the Road Fund, to earmark funds for road maintenance. As reported in the PEFA, the maintenance budget is not adequate to maintain the quality of infrastructure.

As a result, comprehensive information is not available on how borrowed funds have been spent and whether such spending meets appropriate economic and social criteria. For the first two Eurobonds (US\$750 million issued in 2012 and \$1,000 million issued in 2014), a detailed plan for their expenditure was issued (See World Bank 2017: 32), with most of the resources targeting infrastructure, mainly roads. The World Bank (2017: 32) notes that where resources have not been linked to specified investment, they have been largely used to finance public consumption.

Road investments are undoubtedly a priority in Zambia, though it can be argued that maintenance of the existing network deserves a higher priority than much new construction. Comprehensive road investment programmes are under implementation (the Link Zambia 8000 for US\$5.4 billion, the Pave Zambia 200 Project, plus urban road programmes for Lusaka and the Copperbelt). However, in addition to questionable priorities (notably major trunk road investments in areas of low population density and little-travelled areas), the costs of road construction in Zambia appear to be significantly higher than in other African countries (World Bank 2017: 33).

⁵ Planning and budget legislation has been promised for some time, but has not been presented as at the time of writing.

In addition, serious questions have been raised about various recent investments, notably the procurement of 42 fire trucks in 2017 at US\$1 million each and a \$280 million investment in a digital migration platform for public broadcasting.

Finally, the strong spending appetite for recurrent (consumption) spending, particularly wages (personal emoluments), at the expense of investment expenditures has been a source of concern. Actual wage bill expenditure (releases by the Ministry of Finance) averaged 37.4 per cent of total domestically financed expenditure during 2015–17, marking personal emoluments as holding the largest share of recurrent expenditure in the country (Table 2). Because public sector wages and salaries are constitutionally protected from underfunding, the wage bill burden can be expected to remain a significant feature in Zambia’s fiscal landscape over the medium term.

Table 2: Expenditure releases on selected recurrent budget items

	2015		2016		2017	
	ZMK billion	% of DFE	ZMK billion	% of DFE	ZMK billion	% of DFE
Personal emoluments (PEs)	16.1	35	18.8	40	20.0	37
Interest payments	5.2	11	7.4	16	9.8	18
Strategic reserves (FRA)	1.9	4	0.9	2	1.0	2
Government goods and services	5.1	11	4.8	10	4.9	9
Farmer Input Support Programme (FISP)	2.1	5	1.9	4	2.8	5
Domestic finance expenditure (DFE)	46.2	100	46.7	100	53.8	100

Source: Authors' construction based on Ministry of Finance Annual Economic Reports (various), available at www.mof.gov.zm/?page_id=5246 (accessed February–August 2018).

13 Conclusions

This paper extends and amplifies the observations of others and also provides some new perspectives towards understanding the boom over Zambia’s economic history, recounting the fortunes and misfortunes of the economy in the wake of swings in the copper mining industry. In many ways the paper corroborates the views and assertions of others. For instance, Adam et al. (2014: 19) judge the period until 2002 in Zambia to have been a failure from the point of view of copper extraction and use:

Successive governments did not use the revenues from copper to accumulate productive assets. Instead, they were used to finance consumption subsidies for the population and production inefficiencies in the state-owned copper company. In reality, the policy was even worse: not only were revenues from copper used for these recurrent purposes rather than for investment, they were also used as the implicit collateral for international sovereign borrowing ... Hence, far from accumulating assets, the country accumulated debts.

Adam et al. go on to argue that Zambia was saved from these errors by the rise in the world price of copper and by the debt forgiveness (HIPC and MDRI) that largely cancelled Zambia’s debt by 2006. Some 12 years on, the risks and challenges described by Adam et al. remain all too evident.

Compared with 2002, Zambia in 2018 finds itself with a similarly bullish price outlook for copper and other commodities (most notably cobalt); with an industry that, through privatization, has begun to operate more efficiently and is contributing much more than it did in earlier periods to the public revenue; attracting significant foreign investment; but with an even more catastrophic

accumulation of sovereign debt and virtually no prospect of official debt relief. As noted earlier, there is no mineral boom in prospect for Zambia given current price and output projections; rather, there is a reasonable chance of avoiding debt distress if strong fiscal management is put in place.

The current mining fiscal regime appears generally well placed to ensure a reasonable sharing of mineral revenues between the private sector and the state, with the possible defect that it is insufficiently progressive and will come under renewed pressure if copper prices are sustained at the present levels. If and when changes in the regime are contemplated, it will be important to base them on good analysis and, to the extent possible, on wide consultation.

Probably the main lacunae in the mining fiscal system are the weakness in data and, particularly, the vulnerability to mispricing, profit shifting, and other IFFs. It should be emphasized that there is little hard evidence on the amounts being lost through these means, but there can be no doubting the need for more transparency around all mining transactions, or the challenges involved in making this happen. A good start has been made with the MVCMP and MPMSP projects, but more will be needed. Related to this, strengthening capacity and co-operation among the key government agencies involved in the mining industry should remain a high priority. The widespread mistrust of the mining industry among stakeholders requires greater transparency, at a minimum, together with a stronger effort to improve the dialogue.

The recent accumulation of debt, and the great challenges to fiscal management, including but not limited to public investment mismanagement, should set in motion a process of learning the lessons and ensuring they are widely understood—in addition to the obvious need to achieve better fiscal results and manage the debt stock going forward. Zambia's institutions dealing with economic management have been weakened in the recent past, for reasons that need more investigation and analysis but which start with an apparently dysfunctional political system. The ability of Zambia to ringfence and prudently use the mineral revenues from copper mining in building productive capacities through asset accumulation remains elusive, as recurrent consumption expenditure demands dominate the fiscal landscape and the agenda of the fiscal authorities.

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