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WIDER Working Paper 2018/51

Zambia's mining windfall tax

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May 2018

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: In 2008, the Government of Zambia reformed its mining tax regime for large-scale copper mines through a unilateral legislative change. The country went from having one of the lowest average effective tax rates and government take to be above the average. We focus on a particularly controversial element of the packet of changes: the windfall tax. We trace adjustments in the mining tax regimes since independence and calculate effective tax rates and the fiscal sharing between government and companies. Empirical evidence shows the 2008 mining tax regime as being both understandable and justifiable from an economic point of view, considering the nature of the state and the copper companies.

Keywords: Zambia, mining, windfall tax, fiscal benefit sharing
JEL classification: Q00, Q01, Q28, Q32, Q38

Acknowledgements: We thank Tony Addison and Alan Roe for comments and suggestions.

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This study has been prepared within the UNU-WIDER project on 'Extractives for development (E4D)', which is part of a larger research project on 'Macro-economic management (M-EM)'.

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ISSN 1798-7237 ISBN 978-92-9256-493-3 https://doi.org/10.35188/UNU-WIDER/2018/493-3

Typescript prepared by Lesley Ellen.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

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1 Introduction

In his budget speech for the 2008 fiscal year, Zambia's Minister of Finance Ngandu Magande presented fundamental changes to the fiscal and regulatory regime for the mining sector. The changes would become effective by April 2008 through amendments in the mining and income tax acts. On 11 January 2008, two weeks before the minister's budget speech, the intention to change the mining tax had already been stated by President Levy Mwanawasa when he officially opened the parliament. The fiscal changes were intended to increase the estimated effective tax for a model large-scale copper mine from 31 to 47 per cent.

The aspiration was to lift Zambia from a situation of having one of the lowest[1] tax burdens on large-scale mining in the world to having an above average tax burden. Generous fiscal incentives had been granted during the privatization that had taken place during the late 1990s and early 2000s. This period had seen Heavily Indebted Poor Countries (HIPC) debt reduction negotiations and an annual net drain on the state budget of US$1 million per day from the mining sector. A dire need arose to privatize and thus shore up the budget. These pressures, in a situation with increased production and copper prices and the need to avoid further problems resulted in an unsatisfactory sharing of the benefits between the government and mining companies.

This situation was not unique to Zambia, but the impact was heavier than in other countries due to the greater economic, social, and political importance of the mining industry in Zambia. Throughout the developing world, more than 110 countries had either replaced or made changes to their mining codes that had operated over the previous 20 years (Otto et al. 2006). According to Smith (2012), the International Monetary Fund (IMF) was extraordinarily busy in the 2006–12 period, with 85 technical assistance missions focusing on the reform of the fiscal regimes of the extractive resource sector.

Katz-Lavigne (2017) points to transnational, regional, and domestic processes at work, creating a wave of renegotiations of mining contracts in Sub Saharan Africa in recent decades. Campell (2009), and Besada and Martin (2013) confirm this view as a fundamental reaction to the emerging unequal benefit sharing in mining. Underlying this reaction was the prevalence of outdated mining regulatory models from the nineteenth century, premised largely on self-regulation.

Adam and Simpasa (2010) estimate that the windfall in the mining sector from 2002 to 2008 was equivalent to 66 per cent of Zambia's 2002 gross domestic product (GDP)[2] and conclude that: 'the income from the windfall accrued overwhelmingly in the form of rents to the mine owners which, net of investment, has in turn been almost entirely remitted offshore in the form of profits' (Adam and Simpasa 2010: 35).

Zambia was not the first country to launch a mining reform and privatization, but its reforms triggered greater controversy than reforms in other countries for two main *immediate* reasons.

Firstly, the Government of the Republic of Zambia (GRZ) chose officially to annul the existing Mineral Development Agreements (MDAs). These were individual mine-by-mine agreements which had earlier prevented the government from legally enforcing legislative fiscal adjustments

[1] It is worth noting that the large increase in investment combined with 100 per cent capital allowance also contributed to this situation.

[2] The 500 per cent rise in copper prices was obviously an important trigger underlying this.

on mines. This was controversial and different from the smaller fiscal-adjustment reforms introduced after privatization in earlier years such as 2003, 2005, and 2007. Several mining companies disputed the 2008 mining code changes as they represented a unilateral action by the government. These were also contrary to the stability clauses in the MDAs that were supposed to override and protect against legislative changes made locally (also prescribing international arbitration if this occurred).

Secondly, the new tax regime included not just one but a whole 'package' of the following fundamental adjustments: a variable income tax[3] and a cost-adjusted, price-graduated windfall tax.[4] Also included were: a multiyear linear capital allowance,[5] a withholding tax on services,[6] limitations on loss carry-forward, hedging treated as a separate business activity, ring fencing of new mine investments, and a reference copper price.

The *deeper structural reason* why reform was so controversial is Zambia's enormously strong dependence on copper. The state and institutions were intertwined with the mining sector in many ways. Firstly, the country emerged as a modern state largely due to the development of large-scale copper mining (Whitworth 2014). Secondly, despite prolonged periods of expatriation of the mineral rent from Zambia before independence (Sampson 2006), large-scale infrastructure and urbanization based on copper mining provided a foundation for a country that was already middle-income by the 1960s. Thirdly, when at independence the regulatory rights shifted to the new national government of Zambia, an effective fiscal regime combined with continued high prices and production resulted in a mineral rent surplus equivalent to 20 per cent of GDP (Aron 1999: 272–3). Fourthly, during this period half of Zambia's working age population had wage jobs in mining.

The politics of the resolute and dramatic tax policy decision in 2008 was strongly linked to the structural influence of the copper-mining sector. The campaign of the Patriotic Front's (PF) presidential candidate Michael Sata—who nearly ousted the ruling Movement for Multiparty Democracy (MMD) in the November 2006 elections—had focused on increasing mining taxes and reducing mineworkers' personal taxes. The PF had thereby managed to unseat MMD in the Copperbelt and Lusaka. It aimed to persuade the voters that MMD had 'sold out' to the mining multinationals. As MMD looked forward to the 2011 election, the signals from by-elections after 2006 indicated big MMD losses. Strengthening the mining tax regime was the obvious move for MMD to tip the scales back in their favour.

However, rapid changes in the world copper market and political developments in Zambia brought about the quick demise of much of the 2008 tax package, with parliament passing major amendments to the fiscal regime on 27 March 2009. The global financial crisis led to the copper price falling by 50 per cent in a few months. By late 2008, several mines had ceased production and were operating on a care-and-maintenance basis. This, combined with the ensuing political

[3] Of 15 per cent that was applicable only on net profits above 8 per cent.

[4] Starting at 200 per cent of the average reported operational cost level among large-scale mines. Applicable for the 2008 fiscal year at 25 per cent (above US$2.50 per pound), 50 per cent (above US$3 per pound), and 75 per cent (above US$3.5 per pound), but to be indexed according to the operating cost rule. It is possible to argue that the windfall tax represented a progressive gross royalty fiscal instrument. There were specific rules for cobalt.

[5] Four-year straight line (25 per cent per year).

[6] At 15 per cent rate applicable.

debate about the 2008 reforms as well as legal threats of arbitration, led to the March 2009 amendments.

Politically, an important factor for the retraction of the tax package was the sudden death of President Mwanawasa in June 2008 and the election of former Vice-President Rupiah Banda as head of state in late 2008. Banda was known to have negative attitudes towards the mining reforms and had family with ownership interests in mining-industry supply firms. Banda had introduced temporary measures downplaying the new mining tax regime when he was acting president while Mwanawasa was ill.

In many ways, the debate on the windfall tax and the entire mining tax regime introduced in 2008 is still ongoing in Zambia. It has involved political parties, civil society, and mining companies as well as the donor community and the public. This paper will attempt to clarify what led to the introduction, details, and shifting implementation of this tax regime culminating in a series of readjustments that has continued up to recent times. Through this analysis, we aim to contribute to the understanding of how mining fiscal regimes emerge, adjust, and work in practice.

The structure of this paper is as follows. Section 2 provides a brief tour of the evolution of copper tax regimes in Zambia, before turning in Section 3 to consider the political/administrative backdrop to the introduction of the 2008 mining tax regime. We then describe the package of mining tax changes and the purpose of the different tax types and, using historical cost, production, and price data, look at the *effect* of the key tax regimes seen in Zambia (Section 4). After a brief retrospective review (Section 5), we conclude in Section 6 with possible lessons that may be learned from the imposition of the 2008 windfall tax package.

2 The evolution of copper tax regimes in Zambia

Zambia's development has been characterized by shifting approaches to the management of copper mining. The mining tax reform that took place in 2008 is one of several distinct shifts in Zambia's mining tax regimes since the beginning of large-scale commercial copper mining in the 1920s. Below we describe and discuss several of these shifts.

A dividing line between a true regime *shift* and a mere *adjustment* within the same type of regime is, however, somewhat hard to draw. In this paper, we use *shift* when there is a change in at least one of the following four characteristics of the tax regime:

- Type of tax base (e.g. change between a profit-based tax and a revenue-based tax)
- Calculation of the tax base (e.g. a change between gross and net calculation)
- Type of tax rate (e.g. a change between fixed and variable tax rates)
- Tax treatment of investment (e.g. between same year or multiyear depreciation).

These characteristics combine with other elements to constitute the system of mining taxation. Important among these other elements[7] are the degree of ring fencing, norm pricing, loss carry-forward provisions, state ownership interests, tax incentives, and fiscal stability. These elements, working together, then largely decide important characteristics of the overall system like risk sharing between companies and the state, and the degree of front loading versus back loading of shared revenues. In what follows, it is clear that the perceived needs of successive governments

[7] The following elements are further explained in Section 4 of the paper.

have changed the system and its properties over time. Not surprisingly, several phases in the management of Zambia's copper sector therefore display similarities and reoccurring features over time.

2.1 Pre-independence fiscal regimes

The fiscal regimes in mining up to independence in 1964 were relatively stable and dominated by the mineral royalty, which remained mainly unchanged from the 1920s until 1966. The royalty was set at 13.5 per cent of the sales value[8] minus a small cost adjustment. In addition, there was a corporate income tax of 37.5 per cent applicable on profits up to Kwacha 200,000, increasing to 45 per cent for profits above Kwacha 200,000. Overall, the tax regime could be characterized as *mixed*, with the tax based on both profit and revenue, net-based calculation, a fixed rate, and a 20-year write down of investments. Government revenue was dominated by royalty income at an estimated £160 million versus £40 million from the profit tax in the 1923–64 period (Saasa 1987).

2.2 Changes following independence

In the first years of independence, the new government kept economic policy, including mining policy, relatively stable. Despite this stability and a strong increase in global copper prices (from £200 to £500 per ton), complaints were voiced by the two major mining companies, AAC (Anglo American Corporation) and AMAX (American Metal Climax). There were some grounds for complaint since the companies had, prior to 1964, been able to internalize high royalty payments to the British South Africa Company (BSAC), which had granted mining concessions to the companies under its charter given by the British government. Because of their ownership shares in BSAC, their royalties did not constitute a regular user cost or payment since they were actually part of their total profits in the mining operations in Zambia (Sardanis 2011). As these royalty payments were now to be made to the GRZ, they constituted real user costs and sharing of the rents and profits with the rightful owner of the national resource.

A further sign of changing times in the fiscal regime came in 1966 when the Zambian government introduced an export tax on copper, set at 40 per cent of the sales value if the price was above Kwacha 600, using the LME price as a norm.[9] This was the first attempt to introduce a windfall or progressive royalty tax type in the Zambian fiscal regime, with the purpose of capturing abnormal company gains solely due to changes in international prices. In the years that followed, the preparation of an entirely new economic policy and governance system took place in Zambia. This led in 1970–75 to a fundamental shift in which the government, through legislative change, took a majority position of 60 per cent in the two major mining companies with operations in Zambia. The process was finalized in 1982 when the government took full control through the integrated state company Zambia Consolidated Copper Mines (ZCCM).

The period of gradual mine nationalization from 1970 to 1982, in addition to the direct majority ownership interests, saw a major change in the mining tax regime towards a net profit and fixed-rate approach. A mineral tax of 51 per cent on net profits replaced the combination of the royalty and export tax. This provided an answer to complaints that the earlier regime did not distinguish clearly between high- and low-cost mines and between high- and low-price periods over time. This had particularly created concerns and low investment in the aftermath of the 1973 copper price fall. The 51 per cent tax was made deductible from the regular 45 per cent corporate income tax.

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[8] Calculated by using the London Metal Exchange (LME) price at the time of production as a norm price.

[9] 600 Kwacha was equal to £350–360 at the time.

In addition, a full investment write-off was granted, together with fiscal stability at the beginning of the period. A tax refund mechanism applied to new investments.

The mining tax regime entered a new phase from 1983, with the state company ZCCM in charge of all mining operations and sales. The regime evolved from a system based on net profit and fixed tax rates towards a system mainly based on gross revenue and with fixed rates where the major tax instrument, through times of low prices and cost increases, became the reintroduction of the export tax. Export tax rates increased from 4 per cent in 1983 to 13 per cent in 1985 and thereafter. This was additional to the existing 51 per cent mineral tax and 45 per cent corporate income tax. However, the last two were not paid to any significant extent through most of this period since companies frequently ended up with a loss position or insignificant profits after the deduction of the export tax.

Other main conditions in the tax law remained unchanged. However, a significant cost element that had already emerged from the deteriorating overall economy from the mid-1970s onwards was related to the exchange rate policy. McPherson (2004: 331) estimates that the cost to ZCCM in 1992 of having to utilize the official rate rather than the parallel market rate had an implicit cost effect that was almost double the effect of the import duties and income tax per unit produced (at 14 versus 7.9 cent). This raised the overall costs of ZCCM to US$1.19 per pound, significantly above the combined revenues from the sale at US$1.04 per pound.

The combined results of the above tax regimes were excessive and in many years well above 100 per cent both at the margin and on average. This clearly hindered investment and development and contributed to the dramatic fall in copper production and mineral revenues in particular from the late 1970s. An illustration of this is the estimate by Whitworth (2014: 6) using the actual copper price, which shows that if Zambia had managed to keep its production at the level of the 1970s, it would have had an accumulated mineral rent of a staggering US$60 billion versus the actual of US$15 billion. Whitworth (2014) provides a comparison with Chile, which also nationalized its copper industry in the 1970s but managed to increase production by 4 per cent and 11 per cent per annum in the 1980s and 1990s. Lundstøl (2018) analyses how the improved benefit sharing was realized primarily through the Chilean state's direct interest in CODELCO, the equivalent of ZCCM in Chile. It is worth noting that the high implicit costs related to the social obligations of ZCCM from nationalization no doubt also contributed significantly to the rise in costs and the financial unsustainability over time.

2.3 Reforms in the 1980s and 1990s

As with many African countries in the 1980s and 1990s, Zambia entered a period of reforms of both its polity and economy. The major economic reforms took place while the country went through a deep debt crisis (debt service was between 20 and 230 per cent of government revenue), with low growth (having halved its real income per capita) and considerable aid dependence (20 to 30 per cent of GDP). *Privatization* in the mining sector was part of Zambia's reforms, but came somewhat later. The sequence resembled that in many other countries. The reforms usually started with an emphasis on stabilization, which was then followed by liberalization and, finally, privatization.

Initially, it was intended to privatize the mining sector together with the rest of the parastatals under the government's overall economic recovery programme. The reforms were to be part of the actions following from a Privatization Act in 1992 and the establishment of the Zambian Privatization Agency. In the interim, the tax regime was adjusted through a revision to the mining act in 1995. The earlier emphasis on indirect taxes, such as sales and import taxes, was changed back to be based on a netback (sales minus a cash cost measure) royalty rate of 3 per cent, while

sales and import taxes were largely removed. Ring fencing of profit calculation and tax liability per mine, instead of per company, were also introduced.

Since privatization was delayed, the government adjusted the mining tax regime both in 1998 and in 2000, lowering the royalty rate to 0.6 per cent, reducing the corporate tax rate to 25 per cent, extending customs and excise exemptions, and extending loss carry-forward provisions but removing the short-lived ring fencing introduced in 1995. Exemptions from various withholding taxes were introduced, and limits on rights to carry forward losses for tax purposes were relaxed.

The privatization process, however, proved to be difficult despite a series of internal and external reports and analyses such as the Kienbaum report in 1994.[10] No active work to sell ZCCM's mining assets took place before 1996/97. This coincided with increasing pressure on the state budget as ZCCM was making losses of up to a hefty US$1 million per day in the late 1990s. The total estimated losses of ZCCM from 1993/94 to 1997/98 was US$606 million (McPherson 2004).

Finally, the government appointed the former chief executive officer of ZCCM to oversee the sales of its assets, and he was in a charge of a process that lasted several years. To many, this was an explicit signal that the state did not want a transparent process. The process departed from a report delivered by Rothschild[11] in 1995/96, repeating the analysis of the Kienbaum report from 1994, and concluding that ZCCM was among the world's highest cost producers while simultaneously not carrying out much reinvestment to increase production. The process of implementing the Rothschild plan was assisted by the law firm Clifford Chance and proceeded in several phases. For some mines, the process included multiple rounds of re-sales due to the inability of the original owners to operate the mine. A mix of high costs and low prices caused by a downturn in the international market until 2003 had made the situation impossible for them.[12]

The privatization did significantly improve the rehabilitation of the mines, such as the reinvestment in the mines of US$2.8 billion from 1998 to 2007; as a result, employment increased from 25,000 to over 60,000, and production increased from 275,000 to 561,000 tons per year. This, however, took place within a fiscal regime and contracts that were not securing a reasonable share of the upside from 2003 onwards (see Adam and Simpasa 2010). The main problem was elements in the mining tax regime, including the overly generous loss carry-forward condition, combined with the 100 per cent capital allowance. Meanwhile the government, through its holding company, Zambia Consolidated Copper Mines-Investment Holdings (ZCCM-IH)—where the state had 75 per cent of shares—absorbed close to US$1 billion in debt. The state through ZCCM-IH had a minority shareholding of 10–20 per cent in most mines and a limited price participation agreement[13] that was unable to secure windfall or rent shares of any significant scale as prices increased.

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[10] As early as 1993, Zambia's second Privatisation and Industrial Reform Credit (PIRC II) from the World Bank required that the government study options for privatizing ZCCM. A German Company, Kienbaum Development Services (GmbH), was contracted to assess the options and reported in April 1994, recommending that ZCCM be unbundled into five separate units (Kienbaum Development Services 1994).

[11] N.M. Rothschild & Sons of the United Kingdom (N.M. Rothschild & Sons 1996).

[12] See McPherson (2004) for an explanation of these reports or Craig (1999) for a fuller discussion of the privatization of the mines as well as other sectors.

[13] The details of the price participation agreement (PPA) were set in the Mineral Development Agreement (MDA) and varied by mine and the mineral produced. It was calculated above a set level of the realized mineral price or a differential of the price and operation cost, with an annual maximum and aggregate multi-annual level (within the lifetime of the MDA). An example of the former PPA approach was 25 per cent of the copper price above US$1.03

The mining tax regime changes and some second and/or multiple rounds of majority share sales associated with the privatization wave from 1998 to 2003 lasted up to 2007 and, in practice, to 2008. In 2007, the government introduced legislative changes that adjusted the regime to a 3 per cent royalty, a 30 per cent corporate income tax, and a 15 per cent withholding tax on dividends, management services, and interest. However, this had close to no effect on the actual tax regime for mines with existing development agreements (DAs) as it applied only to *new* mining licences.

2.4 Launching the 'windfall' regime

The introduction of the 2008 mining tax regime caused a marked change in the taxation of the mining sector. Here, we provide a brief outline of this regime, which will be presented in more detail in later sections.

Following an extensive national debate and the constitution of a renegotiation committee in 2007, a new regime with a shift to emphasis on revenue, gross tax base, and variable rates was installed with effect from April 2008. The principal elements were: a variable corporate income tax of 15 per cent; a windfall tax at variable 25 per cent, 50 per cent, and 75 per cent depending on the copper price; a 15 per cent export levy on copper concentrates; and an annual 25 per cent annual capital depreciation allowance. Other important elements of the package included: use of derivatives/hedges treated as a separate business activity; limitations on carry-forward of losses for tax purposes; prices for taxation purposes based on norm prices; and ring fencing of the tax obligations of new mines.

The most important element of the package was progressive 'windfall' taxation based on the production/export value above 200 per cent of the average calculated operational costs of the companies in Zambia. The intention was to establish a fiscal regime that would increase the effective tax rate with higher mineral prices and profits and reduce the tax burden at lower price and profit levels. Importantly, the design explicitly accommodated the fact that the tax collector, the Zambia Revenue Agency (ZRA), and the government in general had limited capacity to effectively enforce the fiscal regime and secure reasonable levels of revenues and resource rents from the extraction of the non-renewable national resource.

However, some elements of the package, and particularly the non-deductibility of windfall tax and the high windfall tax rates, did not go down well with the mining companies. They argued that these high tax rates and non-deductibility of windfall tax would translate into a situation whereby certain high-cost mining operations could, during times of very high copper prices, experience marginal tax rates above 100 per cent. In order to address concerns raised by the mining companies, the government opted, through the 2009 budget changes, to scrap the windfall tax but maintain the variable profit tax. Whereas these changes were seen to take the 'sting' out of the 2008 regime, they retained most of the rate changes and the new items under the regime. Exceptions to this were the former one-year 100 per cent depreciation and the restrictions on the loss carry-forward that were repealed.

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per pound accruing until the payment of dividends, and with an annual cap of US$16 million and an aggregate of US$125 million. All indexes utilized were adjusted by an agreed international price index.

2.5 The aftermath of the 2008 change

From 2009 to 2016, Zambian mineral taxation regimes exhibited an uneasy variation, clearly influenced by the market situation—copper prices had halved over the previous five years—and changes in the economy and economic policies. During the previous eight years, there had been so many changes in taxation that Zambia had acquired an unofficial world record in mining tax instability.

The 2009 regime was largely maintained during 2010 and did not change in 2011 despite a change in government (MMD to PF). The year 2012 saw appreciable change with the royalty rate pushed up to 6 per cent from the previous 3 per cent, the export duty on copper reduced from 15 per cent to 10 per cent, and tax on hedging income set at 35 per cent (KPMG 2013). In 2013, the linear capital allowance of 25 per cent over four years was re-introduced for mining operations, whereas the 100 per cent allowance for prospecting and exploration was maintained. A 10 per cent transfer tax and restrictions on thin capitalization[14] were launched. In 2014, a norm-value for tax calculations, set at LME prices, was again introduced. In addition, the withholding tax was broadened to other sectors.

The year 2015 saw a bold step: the variable income tax for mining and the corporate income tax were abolished but kept at 30 per cent for tolling and processing. Major hikes in rates were introduced, setting royalties at 8 per cent for underground mining and 20 per cent for open cast mining. Depreciation was set at 25 per cent over five years for mining, prospecting, and all other capital expenditure.

The changes in 2015 created a virtual earthquake and, after extensive debate, these arrangements were replaced by lowering the royalty rate to 6 per cent for underground mining and fixing a 9 per cent rate for opencast operations. The variable profits tax and the corporate income tax were re-introduced at 30 per cent for mining operations and 35 per cent for processing. A 100 per cent depreciation rate was re-introduced for prospecting. The carry-forward of losses for tax purposes was limited to 50 per cent of taxable profits.

The latest move came on 13 April 2016 with an amendment to the Mines and Minerals Development Act, 2015. The mineral royalty was reduced with retroactive effect to 1 April and an Income Tax Amendment Bill removed the variable profit tax. A variable royalty tax was introduced for copper production. The rate was to be 4 per cent when norm copper prices were less than US$4,500 per ton, 5 per cent between US$4,500 and US$6,000 per ton, and 6 per cent when the price was higher than US$6,000 per ton. For other base metals and minerals, miners would pay a flat rate of 5 per cent and 6 per cent for gems.

The budget for 2017, launched in November 2016, contained no tax changes. The minister said, 'Government will ensure a stable and responsive mining tax regime. We will also fully implement effective mining monitoring mechanisms such as the Mineral Value Chain Monitoring Project to enhance transparency in the sector' (Government of Zambia 2017: para 52, p.6). The 2018 budget largely continued this line. No changes were made in rates or tax structure. The emphasis was on

[14] A company is thinly capitalized when the level of its debt is much greater than its equity capital. High interest rates and payments on this debt to a related company, often registered in a secrecy jurisdiction, is a well-known way to transfer profits out of a jurisdiction with high taxes and thereby erode its tax base.

improving the implementation of collection rather than the rates. A brief summary of the mining tax regimes since 1964 is given in Table 1.

Table 1: Major mining tax regimes from 1964–2016

	1964	1966	1970	1983	1986	2000	2008	2009	2012	2015	2016
Royalty	13.5[15]	13.5				0.6[16]	3[17]	3	6	6-9	4-6
Export tax		40[18]		4-8[19]	13						
Mineral tax			51[20]	51	51						
Corporate income tax	37.5[21]-45		45[22]	45	45	25	30	30	30	30	30
Variable income tax							15[23]	15	15	15	
Windfall tax							25-75[24]				
Capital allowance	5[25]	5	100[26]	100	100	100	25	100	100	25	25
Reference price	Yes[27]	Yes[28]	No	No	No	No	Yes[29]	Yes	Yes	Yes	Yes
Ring fencing	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Loss carry-forward	Yes	Yes	Yes	Yes	Yes	Yes (10-20)	Yes (10-20)	Yes (10)	Yes	Yes	Yes
Tax haven owner	Yes[30]	Yes	Yes[31]	No	No	Yes[32]	Yes	Yes	Yes	Yes	Yes
State ownership	No	No	Yes (51)[33]	Yes (100)	Yes (100)	Yes (10-20)	Yes (10-20)	Yes (10-20)	Yes (10-20)	Yes (10-20)	Yes (10-20)
Fiscal stability	No	No	Yes	No	No	Yes	No	No	No	No	No

Source: Authors' estimations and calculations based on Saasa (1987), Sardanis (2011), Manley (2013, 2015), and IMF (2017).

[15] Of the value estimated at the time of production minus Kwacha 16 (per ton of copper), using the prevailing LME price. As an illustration, the copper price per ton varied between Kwacha 400 and Kwacha 900 in the years 1963–65.

[16] On the gross sales value, less the cost of transport, insurance, and processing/refining.

[17] On the gross sales value using the LME reference price.

[18] Of the value per ton of copper minus Kwacha 600, multiplied by the amount. This was in fact a sort of a windfall tax, or a royalty with an investment shield, as it aimed to capture a portion of the gains when the prices were at very high levels.

[19] Of the value of ZCCM's sale proceeds.

[20] On reported profits.

[21] Applicable up to Kwacha 200,000 in profits, thereafter the higher rate.

[22] On profits after the mineral tax deduction.

[23] On net profits above 8% (of their gross sales revenue).

[24] On the gross sales value (monthly) using the LME average price, with three rates applicable, the first at above 200% of average reported operating cost (at 25%), the second at above 250% of average reported operating cost (at 50%) and the third at above 300% of average reported operating cost (at 75%). Designed to be deductible from variable and regular corporate income taxes, but introduced as non-deductible, then later only applied at the 25% rate (for all sales revenues above 200% of average reported operating cost) through a special instruction from the government.

[25] 20 years write-down of investments, thereby 5% per year.

[26] Immediate write-off of full investment cost.

[27] For royalty.

[28] For royalty and export tax.

[29] For royalty and windfall tax.

[30] The two largest mining companies registered in Bermuda.

[31] The two private mining companies still registered in a tax haven, but not the government holding company.

[32] All the foreign owners of the mines after privatization had related firms in tax havens.

[33] State ownership percentage in parenthesis.

3 The 2008 package—political backdrop and process of change

What led to the gradual mining tax reforms of 2006 and 2007 and the subsequent large reform in 2008 was fundamentally national discontent and human suffering. To a considerable extent, the discontent and suffering were caused by a comprehensive programme of liberalization and privatization carried out during the MMD Chiluba government from 1991 to 2001. As Larmer (2007) has shown, the immediate costs were perhaps most visible in the urban areas and particularly in the mining stronghold in the Copperbelt region. Overall, formal unemployment increased by 24 per cent and the Human Development Index slid from 110th to 166th place (0.462 to 0.394) from 1990 to 2005.

These reform policies had significant initial support from urban citizens and labour including the mineworkers' union vote. There was a landslide win by the MMD in the elections. The policy changes were a consequence of, and formed a condition for, large amounts of development aid and eventual debt relief for Zambia. As the electorate grew more disillusioned with the MMD government's alliance with the donors who propped up public budgets during the 1990s, a gradual change started to appear in the early 2000s. This manifested itself in the social unrest and protests against a third term for Chiluba and later, in 2001, in a narrow win for the incumbent Levy Mwanawasa of the MMD.

The re-emergence of economic growth, propelled in large part by the significant rise in the world market copper prices from 2003, laid the ground for a shift in allegiances and powers. The privatization that had transferred the majority stake of the major copper mines to foreign multinational companies had succeeded in raising investments, employment, and production from the nadirs of 2000–01. As the copper price and profits increased strongly from 2003 onwards, the tax incentives under the prevailing DAs led to a zero effective tax rate for many mines (Fraser and Larmer 2010). Private investments to raise production after privatization also contributed to this situation, an effect that was common in several mineral-rich developing countries after 2000.

From the elections in 2001 to 2006 and up to 2008, many observers expressed their belief in the rise of a new Zambian developmental state. The PF became a dominant political opposition force and overtook the United Party for National Development (UPND). The UPND had come close to winning the elections in 2001, but its narrow electoral base, concentrated in the Southern Province, had been insufficient for a national victory at the polls. Under the leadership of Michael Sata, the PF rose from 3 per cent of the vote in 2001 to 29 per cent in 2006. The MMD still won by a significantly larger margin in 2006. Nevertheless, the success of the PF in forging what Cheeseman et al. (2014) termed an ethno-populist support base, controlling strategic urban centres, Lusaka and the mining province cities of the Copperbelt, made it necessary for the MMD to change tactics.

Changes in sentiments and alliances came rather quickly and in 2006, the government launched its own home-grown national development plan, the first of its kind since the Kaunda government in the 1970s. At first, the impact on the mining tax and benefit sharing was modest. From 1999 onwards, a government technical committee, co-chaired by the Ministries of Finance and Mines, had examined the situation in the sector. In 2004, the committee was reconstituted and chaired by the Permanent Secretary of the Ministry of Justice and a more thorough examination began. Initially, the mandate and the objective for reforms were limited and the key focus was on the need to level the playing field between the mines. To begin with, only some mines received all the tax incentives related to the 2000 mining tax reforms. At the end of 2006, very generous tax incentives were extended to all major mines, and 11 DAs with uniform standard terms were signed.

The entry of a next phase with a mandate that focused on the obvious fiscal imbalance came quickly. At the beginning of 2007, a new technical committee was chaired by the Secretary to the Treasury and the Permanent Secretary of the Ministry of Mines. Simultaneously, several civil society reports were published, prominently 'For whom the windfalls' (Fraser and Lungu 2007). Hearings were held in parliament regarding the modest fiscal gains from the mines, despite rising prices. The mood of urban citizens and rural dwellers alike combined to put increasing pressure on the MMD government. Visible actions to deal with the mining benefit-sharing paradox and to address the associated labour and environmental concerns were demanded.

A change in opinion about the mining sector and the economy also started to emerge among other key interest groups. In 2005, the majority of international donors were still arguing that the fruits of privatization should come gradually both to investors and to Zambia. The IMF and World Bank reports had already indicated, however, that the fiscal conditions might be too one-sided and would not secure an upside for the government during periods of higher prices and profits. In 2006-07, the mood among the donors changed to one of support for dialogue and possible renegotiations of the DAs, but based on sanctity of contract. The focus was predominantly on the tax regime change for *new* mines and/or the possibility for the future renewal of existing mines' DAs.

During this period, there was a noticeable difference of opinion between the World Bank and the EU on the one hand and the IMF, UK, and Norway on the other. On the World Bank/EU side, several of the main advisors had been engaged in the studies and processes of privatization of the mines and felt that the overall change in the regulatory framework in Zambia should follow a pattern generally recommended during the wave of privatization, deregulation, and fiscal change throughout the developing world in the 1980s–90s. In addition, the EU and the World Bank had provided significant loans and credits to some of the major mines in Zambia and were therefore under pressure from parts of its group system to balance concerns and to prioritize the sanctity of contracts.

They strongly believed that providing advice or assistance enabling the GRZ to break the DAs would not be feasible due to internal guidelines and regulations. Given that other countries in comparable situations clearly had broken similar agreements, this argument was difficult to grasp. A strong illustration of the hard-nosed belief in retaining existing regimes only with minor adjustments and exclusively focusing on new mine licences was presented in a World Bank report to GRZ in 2006-07. The report concluded that it estimated a potential upside of only US$50 million from the mining tax reforms. As we have shown above, the detailed GRZ fiscal model calculations showed a completely different potential. This was also supported by an IMF model simulation at the time.

Despite the World Bank/EU attitude, the donors, led principally by Norway, managed to put in place support to the government to procure international expertise in the areas of fiscal modelling, legal-contractual issues, and strategic negotiations. The support was formally a part of a multi-donor memorandum of understanding between the GRZ and Norway, UK, EU, World Bank, and the IMF. The intention was to analyse and assess a possible renegotiation of the DAs. These activities were to be a first element in a larger reform programme that consisted of several components to be supported by different donors. The emphasis of the programme would be to supply independent technical expertise, assistance, and support to implement reforms of the overall resource revenue management in the mining sector. This included analysis of fiscal-contracts, benchmarking and renegotiations, design and implementation of a sovereign wealth fund, specialized mining tax administration, and the building of technical mining audit capacities. In the beginning, the support was sourced primarily from Norway and the UK.

The government's technical renegotiation committee met regularly during 2007. They undertook several country visits and examined fiscal and regulatory regimes of several other comparable mining countries. Before the summer[34] of 2007, all the mining companies were invited to State House. The chair of the committee, together with the chair of a ministerial committee that had been established, attended meetings hosted by President Levy Mwanawasa. Most mining companies participated in these discussions. In the autumn[35] of 2007, the constituted government committees met on several occasions with the three teams of external advisors (fiscal, legal, and strategic). The meetings considered analyses and assessments of the existing regulatory, fiscal, and contractual conditions of the DAs along with discussions of scenarios and alternatives for action. Not surprisingly, there was some disagreement among the different teams on feasible and/or optimal strategies and ways forward.

The fiscal benchmarking on the government side and the legal advice did not differ significantly from that of the IMF, as presented in several reports to government from 2005–07. One difference in approach was, however, that the government fiscal model was run with actual audited mine level data and different rates of tax burdens. Consequently, results were not purely illustrative model simulations but real time illustrations of the actual mine and company level economics and profitability. This enabled a stronger position for negotiations and suggestions for possible changes to the fiscal regimes.

The watershed decision taken by the government in late 2007 was that it would be preferable to introduce fiscal changes for *all* large-scale mining companies holding DAs. Part of the background was the experience of the 2007 budget. Although the budget included an increase in the profit tax, royalty and withholding taxes it could only be applied to new investors due to the DAs and the fiscal stability clauses in operation. Additionally, it had become clear from the tax modelling in 2007 that even the adjusted 2007-tax regime could not fully address the imbalances in the sharing of windfall gains accruing to the sector.

A new comprehensive reform, applicable to all mining companies, was necessary as the majority of the investment, employment, production, and profits of the sector were associated with three companies (FQM, VEDANTA, and MOPANI) that all had DAs with government. The biggest unknown facing the GRZ at the time was whether the DA holders would agree to migrate to a new tax regime within a reasonable period, and thus render a fair share of the benefits and profits to the country. Would it really be possible for the GRZ to negotiate with each DA holder and achieve a level playing field? What if companies refused?

The estimates, both those based on LME projections and those based on audited mine data, indicated that overall the GRZ would stand to lose at least US$1.5-2 billion over a five-year period if the DA tax conditions were kept. The basis for comparison was the proposed 2008 tax regime in its original form with the windfall tax deductible from the corporate income tax. The analysis furthermore showed that the average effective tax rate under the DA 2008 tax regime was 8 per cent lower than the next lowest major mining country in the world. The GRZ therefore felt that the DAs worked against the overarching purpose of the reform. This was supported by most observers in Zambia, including many of the mining companies and to some extent even the Chamber of Mines.

[34] Northern hemisphere.

[35] Northern hemisphere.

The wording in the DAs was: 'to secure the maximum benefit for, and adequately contribute to the advancement and the social and economic welfare of the people of Zambia', as well as 'to secure an appropriate return on investment for … (mining companies)'. Based on this, the government concluded that the DAs were unfair and unbalanced. Under the principles of common law which are applicable in Zambia, and similar to those of other countries, contracts that are extremely unfair and unbalanced are void. Consequently, the DAs were abolished during the first quarter of 2008 through acts of parliament as presented by the President and by the Minister of Finance's tabling of the national budget with related legal amendments to the relevant acts. The 2008 mining tax regime then became applicable to all large-scale mines in Zambia.

4 The 2008 package—content, effects, and historical overview

The revised fiscal regime for the mining sector became effective from April 2008 through the enactment of the modified Income Tax Act and the Mining Act. The parliamentary decisions represented the culmination of a process of analysis and political discussion regarding the sharing of benefits from the extraction of mineral resources in Zambia. Perhaps the most significant change introduced was the break with the DAs. The existence of DAs had meant that some individual mines and companies received more favourable treatment in practice than that stipulated in the general tax system. The World Bank had already made this exact point in its study of Zambia in 2006 (World Bank 2006).

The overall 2008 package aimed at establishing a tax system that would function effectively both for low- and high-cost mines during periods of both low and high mineral prices. It introduced stronger progressivity during periods of high prices and profits and allowed a lower general tax level when prices and profits were lower. The windfall tax element would stimulate cost consciousness in the industry, ensuring that the mining industry would seek out the business activities in Zambia that gave the highest returns. This would benefit the mines and also the country. A low cost, high-return business environment would make the mining industry in Zambia globally competitive.

The new mining tax regime introduced the following major changes to tax regimes in the old legislation and to rules negotiated in the DAs:

Corporate income tax. The rate was harmonized with the general 30 per cent corporate tax (up from the earlier 25 per cent), which had already been introduced with the 2007 tax changes but did not apply until 2008 for most mining companies. The 30 per cent level was roughly at the prevailing global level and thus competitive in attracting business and jobs to Zambia. The tax was levied on net profits and did not therefore create incentives or disincentives to establishing business.

Variable profit tax. A variable profit tax of 15 per cent on profits above 8 per cent on invested capital was introduced. On top of the 30 per cent corporate income tax, this meant that the average corporate tax became 45 per cent if profits were over 8 per cent. As with the regular corporate income tax, this variable tax was focused on net profits and was hence neutral. However, like the regular corporate income tax, it could be rather easily avoided with regular tax planning techniques through exaggerating costs or artificially reducing the revenue levels in the tax account.

Royalty. The increase from a 0.6 per cent to a 3 per cent rate of royalty was introduced in 2007 but only made applicable with the 2008 reforms. The royalty is a tax based on gross revenue and paid regardless of whether a business is making a profit or not. It represents a cost to the mining

company, comparable to any other cost. As for most costs, the tax was deductible from taxable profits and would thus reduce profits tax if the company made a profit. It would not be deductible for a company making a loss (except for loss carry-forward provisions). The rate hike from 0.6 per cent to 3 per cent was considerable and during low-price periods this could well affect investment decisions for high-cost mines. This change was important, however, for the government since it secured a direct increase in the government take in the short term during high prices and with increasing production and exports.

Windfall tax. A tax levied on gross revenue but kicking in only at a revenue level equal to 200 per cent of the average cost of large-scale copper mines in Zambia. The kick-in point was based on a cost index designed so that it would move along with internally generated and imported inflation, which affected the mining cost level in Zambia. The tax would not apply during low-price periods. There was also a built-in incentive for cost cutting since the tax was levied on gross revenue and would not be increased, as in the case of a corporate income tax, if profits were boosted by cost cutting. The company would keep the entire cost saving. The windfall tax was also a suitable stabilizer in the mining tax system since it was easy to control compliance and enforce it with a minimum use of scarce tax administration capacity. Not least, it would bring in significant additional tax revenue during periods of extraordinary prices. The technical committee had decided that the windfall tax would be deductible from the corporate income tax to avoid excessively high effective marginal tax rates, which would occur particularly in the case of high-cost mines. However, the ministerial committee chaired by the Ministers of Finance and Energy ignored this recommendation and erased the deductibility.

In the 2008 approved package, the first tax bracket was charged at 25 per cent and started at US$5,512 per ton; the second tax bracket, charged at 50 per cent, started at US$6,614 per ton; and the final tax bracket, charged at 75 per cent, started at US$7,716 per ton, based on norm prices. However, on implementation after April 2008, it was only the lowest tax bracket of 25 per cent that applied, due to an administrative order issued by the ZRA following instructions from the Ministry of Finance and initiated by the State House.

Capital allowance. The change from 100 per cent deductibility of capital expenditure from taxable profit in the year of investment to 25 per cent each year over a four-year period was an important part of the package. The 25 per cent limit was aimed at promoting a closer approximation to the true capital cost level in the mining industry and to what constituted investment and operating costs. It would be easier for government to decide where the breakeven cost level was for the mining industry. It would also contribute to stabilizing the mining tax revenue by spreading investment costs over time.

Ring fencing of new mines. 'Ring fencing' means that the surplus and profits emanating from one specific mine is taxed in accordance with the actual economics of *that investment*. This avoids potential tax liabilities related to other mines owned by the same firm being offset against those of new mines, thus avoiding tax and reducing revenues. It also levels the playing field between old and new mining companies and makes it easier for new firms to enter the sector when the business cycle makes investments favourable.

Norm pricing. A norm price was introduced to be used for any transactions regarding the sale of base metals, precious metals, or any substance containing base metals or precious metals, directly or indirectly, between related parties. The price was set equal to the monthly average LME cash price. For base metals or precious metals not quoted on the LME, the Metal Bulletin cash price was used. The norm price was introduced as a measure to minimize transfer pricing practices and tax evasion linked to the corporate income tax (both regular and variable), windfall tax, and royalty. Using a norm makes the calculation of company revenue for tax purposes more transparent and

reduces considerably the risk of transfer pricing on the revenue side in the tax accounts, although transparency challenges related to correct quality, volumes, and by-products remain. A possible downside to the norm price approach is that it does not take account of the remaining cost from the geographical point where the norm price is applied and to the point where the products have reached the markets. These costs include remaining costs for refining and transportation. This use of the norm price usually means that costs after the norm price point—i.e. costs for shipping, marketing, and hedging—become neither deductible nor taxable from the mining profits.

Hedging[36] as a separate business activity. Together with the introduction of the norm price system, the new tax system removed hedging as a cost deductible from mining activities. The 2008 rules regarded it for tax purposes as a separate business activity. From then on, hedging losses would be deductible only from hedging gains, not from the mining revenues. This change was critical, as it had become obvious from analysis and pilot audits that there was a pattern of one-sided losses in this area. Previous years had seen hedging losses as high as 10 per cent of the gross revenues of several mining companies. This change did not affect the mining revenues and an avenue of one-sided losses charged to minimize the tax liability in Zambia was effectively closed. Separating hedging from the mining revenues also improved the qualities of the norm price system. A downside of the change was that companies would now have to wait until they had hedging gains to get a full tax shield against losses. On the upside, the new rules became an incentive for companies to put both losses and gains related to such activities in their Zambian tax accounts, thus showing the true cost–revenue picture for mining operations.

Export levy on mineral concentrate.[37] A 15 per cent export charge would encourage the mining companies to use the available domestic smelting capacity and thereby add value in Zambia rather than abroad. The tax would also reduce the potential gains of transfer pricing through sales of semi-processed copper concentrates where it is difficult to establish an objective reference price. In addition, the tax would reduce potential gains of hiding/smuggling valuable by-products, of which there are many in several of the large-scale mines in Zambia. The most prominent of these were cobalt and gold, for which it seemed obvious that there had been massive under-reporting of actual volumes of production and exports in periods with very high prices. In the case of cobalt, this could have made up possibly US$1 billion of under-reported values in the years with the highest prices globally.

Withholding tax. A change had already been introduced with the 2007 reform, but with the 2008 reform it applied to all large-scale mines. A 15 per cent rate was levied on services to diminish the incentive for using contracts and agreements between related parties and companies for transfer pricing. In a situation where it was difficult to tax the actual gains of mining, and where related firms and beneficial owners were located in tax havens, a withholding tax would represent an effective measure to secure a more stable and reliable revenue flow to the state.

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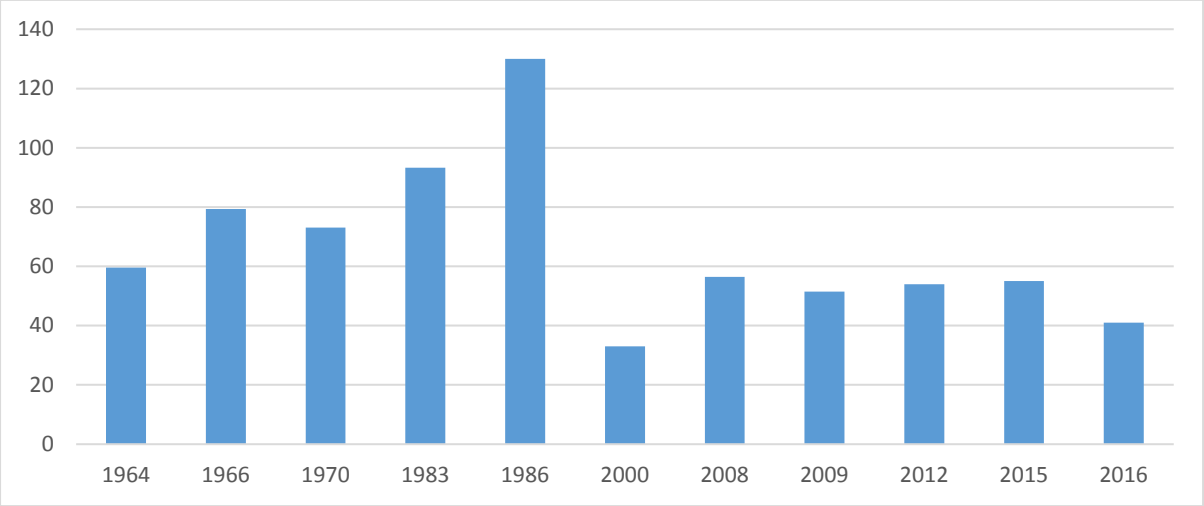
[36] A hedge is an investment position intended to offset potential losses or gains that may be incurred by a companion investment (often related, for example, to the realized copper price in sales-exports). If the contract is entered into with a related entity registered in a secrecy jurisdiction, as has been the case in the majority of mining companies in Zambia after privatization, the risk of using it to transfer profits out of Zambia is significant. Indications of these was found for several of the mines in Zambia.

[37] Copper or other mineral concentrate could be anything from 30–80 per cent of refined copper content, or even more or less, and could also have significant valuable by-products such as gold, cobalt, and other in significant proportions. Price setting in sales and export, often to related company-entity, is difficult to benchmark and query for mineral and tax authorities, thereby creating many opportunities for base erosion and profit shifting.

4.1 Revenue results

Here, we provide comparisons over the period from independence to recent years and construct benchmarks to illustrate key aspects of the economics of mining in Zambia across varying tax regimes. We calculate average effective tax rates (AETR) in the case of 11 different mining tax regimes, spanning the period from 1964 to 2016 (Figure 1). For the 2000–16 years, we adopt the calculations carried out by Manley (2013, 2015), whereas for the regimes in the 1964–1990s period, we provide our own estimate based on available data reported in Saasa (1987), McPherson (2004), Sardanis (2011), and Simpasa et al. (2013). Note that there are uncertainties in comparability as in some cases the data represent averages for the large-scale mines but in others[38] they are model mine estimates using a low- and/or high-cost case. Despite these weaknesses, we do believe, based on a comparison of several sources, that the orders of magnitude are illustrative of the AETR levels represented by the different mining tax regimes over this period from independence to date. (Note the different periods between the years shown in the figures).

Figure 1: Average effective mining tax rate



Source: Authors' estimations and calculations based on data from Saasa (1987), McPherson (2004), Sardanis (2011), Manley (2013, 2015), and Simpasa et al. (2013).

What is striking from Figure 1 is that the AETRs tended to be higher both in the pre-independence era[39] and in the first decades of independence than in the post-2000 period. The former period had estimated AETRs of 59.6 to 130 per cent[40] compared to the estimate of 33 to 56.5 per cent after 2000. To some extent, the lower AETRs observed after 2000 were also a consequence of large investments combined with generous capital allowance rules. Overall, this exemplifies that an assessment of the sustainability or progressiveness of a fiscal regime in mining ideally needs to consider several indicators and be observed over a longer period. The mining tax system, as discussed in Section 2 of this paper, moved towards a gross revenue and fixed-rate system from the 1970s onward but at the same time kept the major net profit tax elements. This made the total tax burden heavy for prolonged periods from the 1980s up to privatization, despite the fact that the profit-based instruments yielded no tax revenue because the state-owned mining company posted either losses or only minor profits.

[38] Notably Manley's estimates for the regimes from 2000 to 2016.

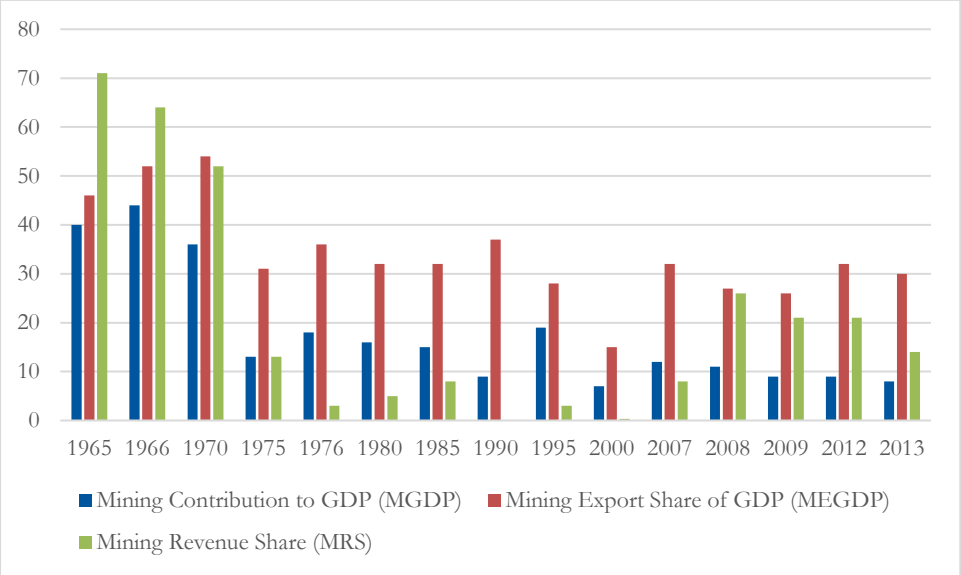
[39] As the pre-independence period had much the same tax regime in place as that of 1964.

[40] Note that special circumstances applied in 1986.

The AETR during the 'privatization mining tax regime' introduced towards the end of the 1990s, and reflected eventually in all DAs by 2006, was dramatically lower than that of any earlier period. Figure 2 shows that the estimated AETR of the 2008 regime calculated by Manley (2013) was of the order of 56.5 per cent, just below the AETR levels applied prior to 1966 and shown in the figure through the 1965 estimates.

The estimated AETR of 56.5 per cent (2008 regime) is well above the average estimate of 47 per cent by the GRZ and the advisory team based on actual audited mine data in 2007. Some of the high-cost mines may have been facing a higher AETR and some low cost mines a lower one, as is unavoidable even with a (theoretically/first best) optimal mining tax regime. The level of tax burden introduced with the 2008 tax regime was not out of the ordinary when considered in a historical comparative perspective. Note here, however, that the major payments in the period from the 1920s to 1964 were made between related companies (see Section 2.2). This, in all likelihood, led to a reduced tax base and an actual AETR for the two dominant mining companies (AAC and AMAX) that was not in reality as high as shown in the graph.

Figure 2: Mining contribution to GDP, export, and government revenues



Source: Authors' estimations and calculations based on data from Saasa (1987) and McPherson (2004) before 1995, and after that on data from IMF (1999, 2010, 2011, 2012, and 2013), ZEITI (2009, 2010, 2011, 2012, and 2013),CSO (2014), UNU-WIDER (2018), and ZRA (n.d.).

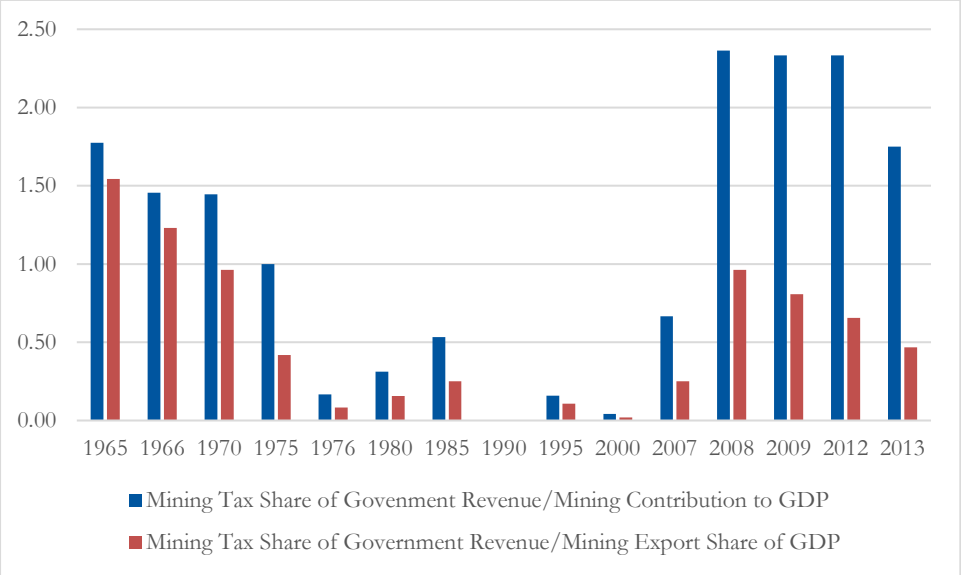
Figure 2 compares mining value added as a share of GDP, mining exports as a share of GDP, and mining revenue as a share of total revenue,[41] thus providing an historical perspective on the economics of the mining sector from independence to recent years. What is most obvious is the relatively larger contributions of the mining sector to the economy in the first decade after independence. From the 1970s onwards, the gap between the estimated contribution to GDP and export widens. Mining's contribution to government revenues was very high until the 1970s, at 52

[41] The data for the period after 1995 are from official ZRA reports, the reports of the Zambia Extractive Industries Transparency Initiative (ZEITI) and other GRZ reports. From both the mining revenue and total revenue, employee taxes are deducted to get a more precise picture of the direct corporate fiscal contribution to the treasury. A major adjustment in particular for the 2008 fiscal year is related to the windfall tax settlements only agreed in 2011 but related in substance to what took place in 2008. It has therefore been added to the 2008 revenue to give a more precise picture. Before 1995, the data are mainly taken from Saasa (1987) and McPherson (2004) (that again use official GRZ sources).

per cent to over 70 per cent. The marked drop shown in 1975 coincides with the large real drop in the world price of copper from the 1973 to 1974.

The mining sector's official contribution to government revenues stayed low for a prolonged period after 1975 and only started to increase somewhat from around 1 per cent in 2005 to 3 per cent in 2006, 8 per cent in 2007, and 26 per cent in 2008. In these years, another noticeable trend was a large and somewhat growing disparity between the official mining contributions to GDP and export respectively. The effect most likely indicates a measurement problem related to the national accounts, which was probably mainly linked to the boom in copper prices and the use of an unchanged input–output ratio for the calculation of the copper sector's GDP contribution. Related discrepancies have also been observed between different GRZ sources of data on production and exports (for example, between CSO and Bank of Zambia (BOZ) estimates). We examine what this meant for the inherent benefit sharing measured through different ratios. A preliminary finding is clearly that the relative share of mining revenues jumped from 2007 to 2008, and we see the inherent challenges with the value-added calculations by examining both the estimated mining share of GDP and exports.

Figure 3: Mining sector ratio contributions



Source: Authors' estimations and calculations based on data from Saasa (1987) and McPherson (2004) before 1995, and after that on data from IMF (1999, 2010, 2011, 2012, and 2013), ZEITI (2009, 2010, 2011, 2012, and 2013), CSO (2014), UNU-WIDER (2018), and ZRA (n.d.).

The ratios examined in Figure 3 indicate the degree to which mining revenues flowed to the government or to the companies in the period from independence to recent years in Zambia. The ratios show the degree of adherence to a simple principle put forward by Conrad (2012: 14): 'Mineral revenues should be a greater share of total revenue relative to the sector value added because government is collecting royalties on a factor of production, a phenomenon unique to the mining industry'. In the first indicator, the numerator is the government's 'take'[42] from the mining sector as a ratio of total government revenues. The denominator is the mining value added as a percentage of total value added (GDP). If the indicator is greater than unity, the sector contributes a greater share of revenue than its share of GDP, thus fulfilling the Conrad principle. The second ratio uses the mining contribution to exports as an alternative denominator thereby providing an

[42] 'Take' includes both tax and non-tax elements e.g. royalties.

alternative indicator. It adds explanatory power here by illustrating a widening measurement problem that makes the first ratio inaccurate, in particular during mineral price booms principally linked to the input–output dilemma of the national accounts.

Figure 3 shows that up to 1970 both indicators were above 1, adhering to the Conrad principle, whereas only the first ratio was above 1 (and significantly so) for the later 2008-13 period (with only year 2008 somewhat closer to 1 also for the second ratio). The data again show the marked change in 2008 when both ratios increase very significantly. The second ratio then shows a drop from 2008 to 2013. The first (GDP-based) ratio also drops but very slightly and much less than the second. Considering the well-known issues related to the national accounts of Zambia (Jerven 2014), the delayed rebasing of fixed-price GDP numbers and the insufficient adjustment of the relevant input–output ratios for mining, this is not surprising in a period with extraordinary increases in both volumes and prices. A similar issue related to the increase between ratios 1 and 2 above were found in an earlier study by Lundstøl (2018) analysing a selection of six key mining countries over a 20-year period (1994–2013). Zambia stood out with an increasing and particularly large gap between the two ratios together with Ghana and Tanzania (compared to South Africa, Australia, Botswana, and Chile). It is important to show this gap to get closer to a realistic understanding of the actual economics of the mining sector. It also illustrates indirectly to what extent the taxation of the sector generated reasonable levels of mineral revenue, or not, without having to relate only to company accounts or actual payments.

We may therefore conclude that whereas the mining tax reforms of 2007 and 2008 did bring about a clear change in benefit sharing between government and companies, the relative gain for the government fell with the subsequent reforms up to 2013. However, it was significantly better than that seen in the period from the mid-1970s after nationalization and up to privatization (a period nevertheless characterized mainly by low prices and low or negative operative surpluses). This might seem counterintuitive as the entire purpose of nationalization was/is to capture a larger share of the value creation for the government/country. The analysis presented here may not, however, be accurate enough to assess this in a fair manner, principally due to the widespread indirect and direct subsidies and costs of the state mining company ZCCM within the local and national economy (McPherson 2004). It nevertheless still represents something of a paradox worth remembering when considering nationalization today, as is the case in many resource-rich but poor developing countries.

5 The windfall tax regime in retrospect

Did the Zambian mining tax regime of April 2008 improve the government take in the mining sector without undermining investment and the operative framework for companies? It is almost impossible to give a definite answer to this question, as we do not have data that can show what would have happened with a different regime. This paper has used a combination of descriptive and historical approaches to discuss this.

In reality, the answer to the question also depends critically on the politics and economics of alternatives and perceptions of influential stakeholders. This is abundantly clear from the differing presentations, interpretations, rhetoric, and the debate regarding, in particular, one key element in the 2008 mining tax regime, *the windfall tax*. The debates have shown that alternative views often have connections to different path dependencies and lock-in of approaches to reform which are presented as optimal regulatory practices. It is likely, for example, that both the reforms upheld from the mid-1970s as well as from the privatization era included elements and/or specifications that with hindsight were both unnecessary and excessive.

Some commentators (for example Land 2010) have criticized the 2008 reforms based on a view firmly anchored in first best thinking regarding mining fiscal regulations. This view does not sufficiently incorporate what really drives investment and operative decisions in mining as Årsnes and Lundstøl (2013) and others have shown. Extractive industry investment decisions are primarily based on the quality of the resources[43] as these resources are immovable and the price off-take opportunities are clear from market information. Whether the tax regime and its implicit AETR is somewhat below or even significantly above that of other countries is not the key decision factor for major investment decisions in mining.

Of course, this does not mean that tax regimes and AETR are *irrelevant* to investment decisions or to operative decisions regarding further investments and adjustments. It *does* mean, however, that the tax regime is normally not the main, or even among the top, issue considered by a mining investor-operator. Similarly, it is therefore challenging to identify what could constitute an optimal fiscal or tax system in the mining sector. It should therefore not come as a surprise, given the characteristics of institutions and the political economy of many developing countries, that Slemrod's (2016: 4) statement that 'the theory of the second best … is really the theory of the first best based on realistic assumptions' could be closer to reality.

What characterizes an optimal mining tax regime and to what extent did the 2008 mining tax regime in Zambia represent this? It is clear from Sections 3 and 4 that one fundamental flaw was the non-deductibility of the windfall tax from the corporate and variable income profit taxes. This meant that at very high prices and for high-cost mines the marginal tax rate could go above 100 per cent. In practice, only the first rate of 25 per cent of the windfall tax was applied, in line with an administrative order issued by the ZRA in May 2008. Overall, we argue implicitly that the 2008 mining tax regime was not far from optimal, given the existing weak capacities in the GRZ to control and enforce a mainly profit- and net-based tax regime prior to 2008.

In principle, any fiscal system for the mining sector must balance the following tax mechanisms (here including royalty, often categorized as non-tax) (see Årsnes and Lundstøl (2013: 28–30) for details and a diagrammatic presentation): gross taxes; net taxes; withholding taxes (usually increase taxation); investment incentives (will always reduce taxation); and exemptions (will always reduce taxation). The tax regime in 2008 introduced a mix of tax mechanisms that aimed to constitute a robust system that could secure an acceptable level of government take for both low- and high-cost mines and during low or high mineral price periods. In Zambia, there were and still are large cost differences between different large-scale mines. According to a study by the ICMM (2014), the Zambian copper mines are mostly in the 90th percentile of the global cost distribution of costs. This does admittedly complicate the design of a progressive fiscal system. Any fiscal-contract system in mining finally chosen will need the support and approval of citizens, interest groups, and politicians. Decision makers will have to consider the balancing point of risk sharing between government and mining companies. A risk 'loving' regime will rely relatively more on profit and net tax types and be back loaded, implying that the government take will accrue later. A risk averse regime will focus more on revenue and gross tax types and be front loaded with a higher early government take.

When making an assessment of the 2008 mining tax regime in Zambia, it is important to consider that the majority of the large-scale mines paid little tax in the early phase of the upturn of the copper–cobalt price cycles from 2003 to 2007. The situation varied between the mines, but the majority were privatized or resold at very low cost during periods of low mineral prices. The basic

[43] Inherent in this is the cost of developing, producing, and selling/exporting it.

and financial economics of mining operations in Zambia have been very beneficial to most owners, despite what the tax account may have shown.

If we take into consideration the previously mentioned complications in assessing the impact of the 2008 reforms, it is still possible to examine the immediate effects in 2008/09. An estimate of additional mining revenue to the state from the revised mining tax regime introduced in 2008 was US$415 million for the 2008/09 fiscal year (budget statement of 2008 by Minister of Finance Ngandu Magande). This meant that for the 2008/09 fiscal year a total of US$557 million was the mining revenue target since the estimate without the changes was US$142 million. The GRZ anticipated that on average the changes would raise the effective tax rate from 31 per cent to 47 per cent, but that the actual tax revenue would vary from year to year depending on levels of costs and prices. Much of the estimated increase was expected to come from the new windfall tax boosted by an anticipated global copper price in early 2008, considerably above the lower trigger prices, and exports estimated to reach 600,000 tons of copper.

As reported in Lundstøl et al. (2013), in the year when it was in place (April 2008 to April 2009), the windfall tax was calculated by the government to contribute 8 per cent of total mining revenue collected. In reality, however, the sum was significantly higher as a large part of the outstanding windfall tax liabilities, due to the disputes surrounding this tax, was only paid through a negotiated settlement between the state and the government in 2011. Detailed estimates carried out in 2009 showed that the total outstanding windfall tax liability for the large-scale copper mining companies was in the order of US$170–180 million for the period from April to June 2008 alone, and US$70–80 million for July to September 2008 (Lundstøl 2009).[44]

From these estimates, we find a total windfall tax liability for the financial year from April 2008 to the end of March 2009 of US$240–260 million[45]. In reality, only slightly more than US$30 million was registered as collected by the ZRA in that financial year. In addition, an estimate of over US$100 million was paid into escrow accounts (from Kansanshi Mines), but only released subsequently following final agreement/settlements with the GRZ. According to our information, this was accounted against the 2010/2011 financial years (see ZEITI (n.d.) reports for Zambia for details, especially for the 2010/11 financial year).

For the 2008 financial year, a full payment in the year of the estimated windfall tax liabilities would have increased total mining tax payment from US$415 million (registered actual mining tax collected) to US$625–645 million (somewhat above the estimate at the beginning of the fiscal year). With this, the windfall tax contributions in the 2008/09 financial year in the total mining tax collected rise from 8 per cent to 38–40 per cent. This clearly shows the potential effectiveness of the windfall tax to increase government mining revenue despite the 2008/09 financial year being an unusual year with the global financial crisis in the middle and an associated 50 per cent drop in the world copper price.

[44] Using monthly export figures of copper from Bank of Zambia and monthly average copper prices from LME from April until the global financial crisis hit in late quarter 3 of 2008.

[45] The windfall tax did not apply below an average monthly copper price level of US$5,512 per ton.

6 Conclusions

The mining tax reforms in Zambia in 2008 represented a very significant change at the time. They were spawned by a complex mix of political, economic, and social forces particular to the national context as well as winds of change in the wider region and developing world. Many observers are critical of the changes that took place and their rationale. It is striking, however, that few if any have recognized that in fact the reforms represented a shift to what were softer fiscal terms than any previous mining tax regime in the country prior to the privatization drive in the late 1990s. Similarly, it was also a lack of appreciation of the severity of the imbalance in the fiscal benefit sharing in the first part of what represented a global boom in mineral prices from 2002/03 to 2008. Adams et al. (2010: 32) provide an illustration of this through a detailed calculation showing that significant mining rent (66 per cent of 2002 GDP) went almost entirely to investors abroad.

Through a historical benchmarking of mining tax regimes' AETRs and an analysis of the fiscal benefit sharing between government and companies utilizing mining sector ratio contributions, we have shown that the 2008 mining tax reform was both understandable and justified from an economic point of view. Fundamentally, it did change the fiscal benefit sharing in favour of the government in Zambia, as illustrated by the comparisons of mining sector ratio contributions in Figure 3. We also see, however, that the relative level of fiscal revenue for the state was still significantly below that of earlier historical periods prior to nationalization in the early 1970s (when adjusting for the national accounts issue in the ratios), and significantly below that of some contemporary mining countries such as Chile and Botswana[46] (see Lundstøl (2018) for details).

To what extent did the 2008 reforms in the mining tax regime in Zambia represent good or bad practice considering the continued instability and 'world record' in adjustments and possibly shifts in fiscal regimes in the sector? As with most such reforms, Zambia's 2008 regime also had flaws, the most obvious of which was due to political distortion regarding the non-deductibility of the windfall tax from the profit taxes. Without this, the regime in principle was both sound from an efficiency and effectiveness point of view, as it had all the main tax mechanisms carefully calibrated considering the actual economics of the major mines. In all relevant stress tests, it performed better than alternative regimes at the time, according to different studies undertaken by the IMF. Estimates indicate that the windfall tax mechanism worked as intended in terms of capturing significant mineral rent in the short period from April 2008 to April 2009. The actual collection at the time was, however, unclear due to political changes and the global financial crisis effects, as well as at a practical level through administrative instructions, threats of arbitration, and negotiations.

Since the 2008 reforms, Zambia has continued on a path of frequent shifts in the mining tax regime. Overall, this has led to a deteriorating trend in both AETRs and the adjusted mining sector ratio contributions (see Figures 1 and 3). This again indicates a gradual worsening in the fiscal benefit sharing between government and companies, and possibly shows both the boom and bust nature of mining in general, as well as the path dependence of certain inherent historical characteristics of varying fiscal settlements in Zambia.

[46] We sound a cautionary note, however, about the quality of the underlying data, as stated earlier in the paper, and add that other studies by the IMF have shown that Zambia had higher revenue shares from 2000 to 2011 than Chile.

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